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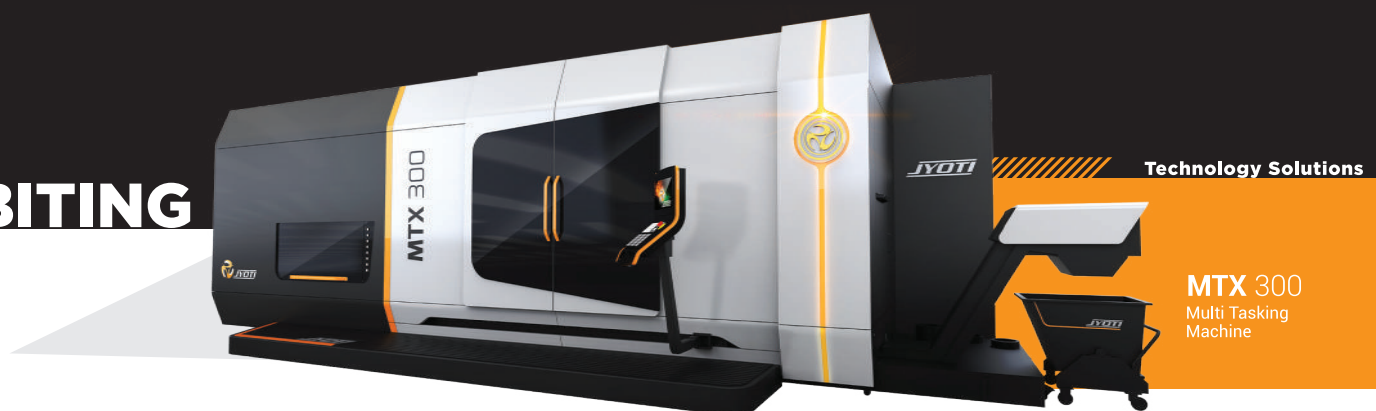
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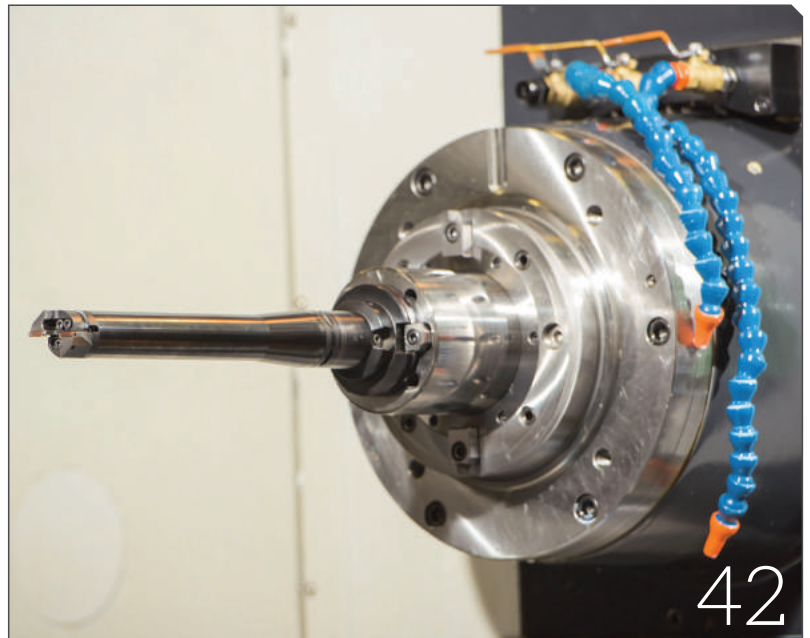
CONTENTS

VOL 1, ISSUE 3, SEPT 2017

40



- 06 **FOREWORD**
- 08 **PUBLISHER'S NOTE**
- 10 **EDITORIAL**
- 12 **IMTMA'S DESK**
- 14 **PANORAMIC PERSPECTIVE**
- 16 **NEWS**
- 20 **MARKET INSIGHT**
- 24 **COVER STORY**
Industry 4.0: Manufacturing's Next Move
- 28 **BIG INTERVIEW**
Luigi Galdabini, President, CECIMO,
The European Association of the
Machine Tool Industries &
Managing Director,
Galdabini SPA
- 32 **COUNTRY FOCUS**
India-Italy: Championing Synergy
- 36 **INDIA @EMO**
Showcasing India's Manufacturing Prowess
- 40 **COMPANY PROFILE**
Customer is the Priority
- 42 **AEROSPACE MACHINING**
Rough Boring Tool Cuts Challenging Material



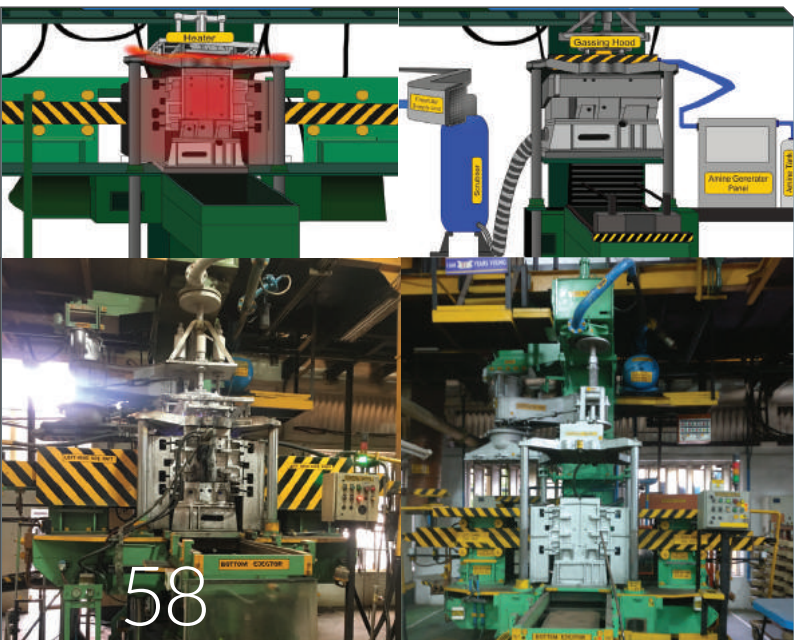
- 46 **AERODEF**
Soaring High
- 50 **PLASMA CUTTING**
Raising Productivity with Right Cutting Consumables
- 54 **INDUSTRY - ACADEMIA**
Forging Ties for Bigger Prospects
- 58 **BEST PRACTICES**
Propelling Towards Excellence



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36



- 60 **SAVE THE DATES-EVENT CALENDAR**
- 62 **NATIONAL PRODUCTIVITY SUMMIT 2017**
Leveraging the Power of Examples
- 64 **DMTX 2017**
Marking Another Episode of Stellar Success
- 67 **PRODUCT**
- 70 **ADVERTISER & COMPANY INDEX**

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GROWTH OPPORTUNITIES IN AEROSPACE & DEFENCE SECTORS

Greetings from the Indian Machine Tool Manufacturers' Association (IMTMA) and Modern Manufacturing India (MMI) magazine September 2017 edition.



Manufacturing needs to take a quantum leap in new and emerging areas such as defence and aerospace. This may perhaps open doors for the machine tool industry to develop new and innovative technologies and strengthen its inherent innovation capabilities. This would also supplement our export potential as well besides giving a big push towards the mission 'Make in India'.

India's machine tool industry is eyeing aerospace and defence sectors as growth markets. Change is on the cards with the Government of India attempting to give thrust to Make in India in policies such as defence procurement policy and strategic partner policy and facilitate partnership between Indian and foreign firms for manufacturing aerospace and defence equipments in the country.

It is expected that private sector will make full use of the opportunities presented before them and forge technology and production partnerships with overseas aerospace and defence companies.

IMTMA is organizing a group participation of Indian machine tool companies at EMO Hannover 2017 in Germany. The exhibition is an excellent opportunity for Indian companies to understand trendsetters in digital transformation and navigational aids for smart factory of the future and technologies that are used by the global machine tool industries.

I firmly believe that EMO Hannover 2017 will be an enabler for the Indian manufacturing industry to strengthen its presence in the global marketplace.

India is working on a roadmap for modernizing its armed forces. An estimated 100 billion USD contracts are likely to be signed in around 10 years. This provides a window of opportunities for Indian and foreign firms to forge alliances for mutual benefit.

The Association will continue to project the machine tool industry as a key enabler of the 'Make in India' initiative and strive to make the industry a global player. I call upon the industry to support IMTMA's initiatives by giving feedback which will guide us in our journey to make the manufacturing sector competitive.

This issue of MMI focuses on defence and aerospace sectors. The magazine also includes an opinion piece from IMTMA in which the Association shares its thoughts on various opportunities in aerospace and defence sectors.

Readers can download previous editions of the magazine from IMTMA website.

Happy reading.

PG JADEJA

President, Indian Machine Tool Manufacturers' Association

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Dear MMI Readers,

It's the pursuit for knowledge and a relentless curiosity to explore that enable manufacturing industry to stay ahead in a world that keeps changing with the blink of an eye.

As the manufacturing industry embarks upon its onward journey, it becomes imperative for it to invest in the latest technologies to stay competitive in its domain. The right use of technology will open avenues for you to be a trailblazer in manufacturing.

The strength of Modern Manufacturing India (MMI) has been its ability to reach out to the core manufacturing sector. Its unique selling point is that it takes the news closer to the users of machine tools, giving them an insight into the most advanced manufacturing requirements critical for industries through informative stories, interviews, case studies and so on.

In this edition, we provide you a first-hand view of the Indian machine tool and manufacturing industry. The issue features an article by IMTMA on aerospace and defence sector manufacturing. The sectors have been earmarked as "key sectors" under the 'Make in India' framework by the Government of India.

I thank you for your continued interest in the activities of the Association by providing your valuable feedback which is beneficial in our onward journey.

I hope that you cherish the time you spend with MMI.

Thank you once again for your support.

Cheers and welcome.

V ANBU
Director General & CEO
Indian Machine Tool Manufacturers' Association

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Soumi Mitra

SOUMI MITRA
Editor-in-Chief
Modern Manufacturing India
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WHERE THE LAND IS FULL OF MARVELS!

Being an ardent admirer of engineering marvels of the past and present and with a dream job to witness them on a frequent basis, I have groomed myself to notice intricacies in the engineering art when I encounter it.

During my recent trip to the Konark Sun Temple, I yet again found myself engulfed in stupor, wondering over manmade miracles and the ability of people behind them to have brought such majestic things come alive and stand tall for centuries with an unabating capacity to induce awe.

Perched on the shores of the Bay of Bengal, the temple, built in the 13th century, is a massive conception of artistic magnificence and engineering dexterity. It is a monumental representation of the Sun God, Surya's chariot with its 24 wheels decorated with symbolic designs being led by a team of six horses. The entire structure is built of stone and interlocked by metals, held together by a huge magnet weighing more than five tonne.

I could now decipher Nobel Laureate Poet Rabindranath Tagore's line: "here the language of stone surpasses the language of man", written in his ode to the motherland, known widely for architectural greatness, and sophistication and abundance of sculptural work.

Today, the materials to work on differ, the tools to shape them have evolved, and the things that take life suit the modern day and age, but the legacy continues. We, the land of engineers, still are in possession of the same talent our ancient engineers had.

EMO Hannover 2017 is an opportunity to showcase that and take pride in the journey that has led us to this juncture in the world of manufacturing. The Indian exhibitors at the trade fair are all set to show the best we have and our capacity to make it still better.

Here's wishing them all and us the success we deserve!

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why you are doing it.
Later they will ask
how you did it.*

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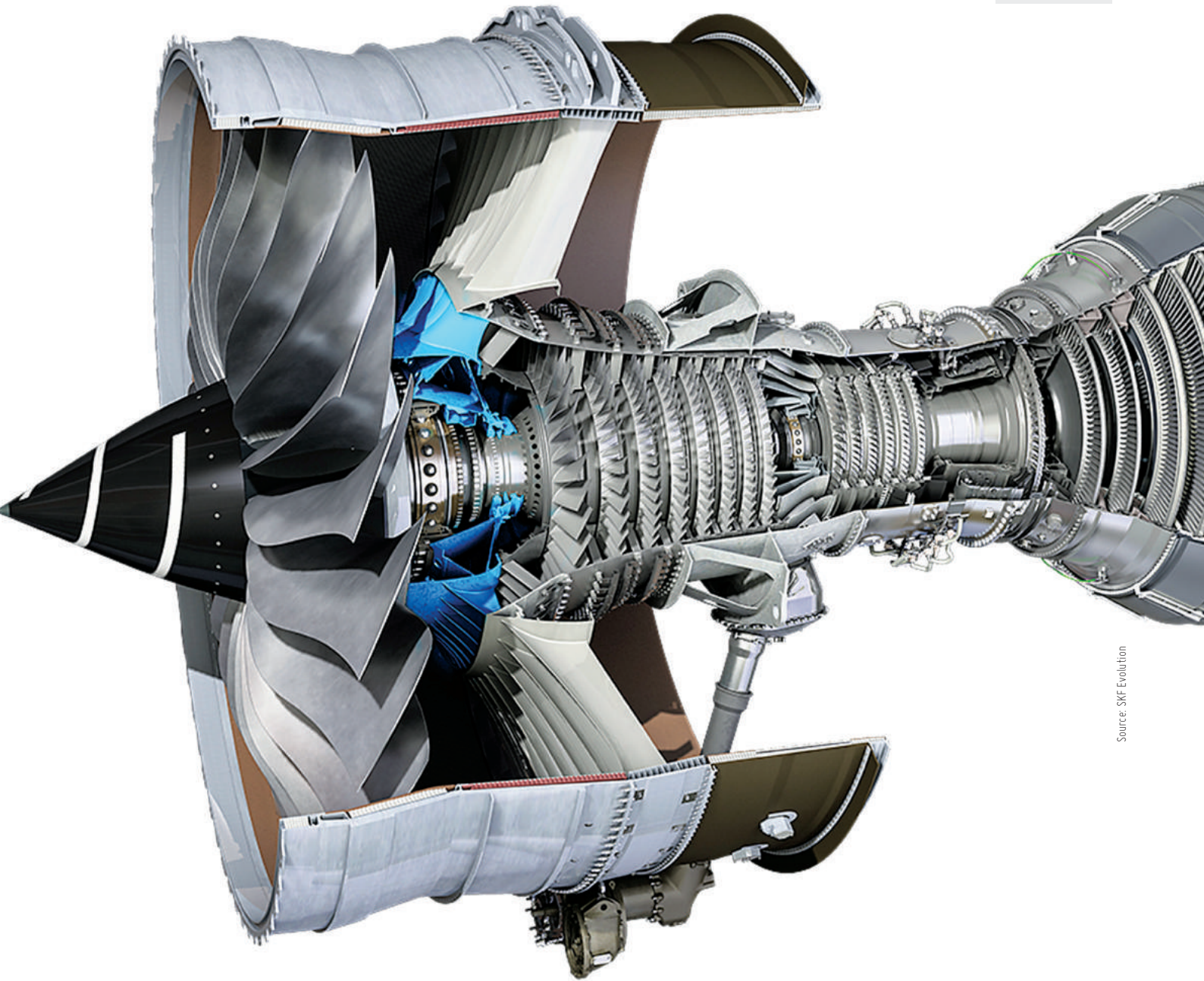
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Source: SKF Evolution

IMMENSE PROSPECTS FOR PRIVATE SECTOR IN AERODEF



HIGHLIGHT

India's share of the global aerospace industry is around \$250 million and as per a joint report by IESA, NASSCOM and Roland Berger the total opportunity in aerospace and defence market may touch around \$70 billion by 2029.

Aerospace and defence manufacturing are two key critical segments earmarked for development and manufacturing growth in India now. The twin sectors which often overlap one another throw immense possibilities for breeding upstream and downstream investment prospects besides promoting innovation and growth.

As India provides robust infrastructure, exceptional port logistics, industrial corridors, availability of land, availability of power and a conducive environment for business, the developments can be expected to progress rapidly.

Favourable policies

India's aerospace and defence segment is evolving. It is attracting all major names across the globe in terms of investments. With the Government of India bringing to the fore investor friendly policies and providing

space for investments the prospects for growth are brighter than never before.

Significant factors fuelling growth are the government's offset policies, robust pool of workers, cost advantages and so on. Aerospace and defence business which until now was largely centered on public sector is now open for private firms as well.

The Government of India, in line with its Make in India policy has given prominence to local industry by making it as the centre for defence production which creates a tremendous opportunity for the private sector.

Defence-private connection

Indian private firms making use of the opportunity have signed developmental contracts with the Ministry of Defence. Notable ones include Tata Advanced System for surface surveillance radar project for the Indian Navy and Larsen & Toubro for production of guns for the Indian army.

To be in sync with its Buy in India, Make in India mantra the government has given impetus to local manufacturing. The government has announced that it will launch around six to eight "Make" projects every year which raises the prospects for greater involvement of private sector in defence manufacturing in the years to come.

As per the Ministry of Defence so far the government has issued 342 industrial licenses to 205 Indian companies and until now 66 licensed companies have reported commencement of production. The defence items produced by these companies are sold to the Ministry of Defence.

Boom in Aerospace

Interestingly the Indian aero-

space sector also shares a similar story.

It is the motto of the Government of India to domesticize the aerospace industry, attract global players and lower dependence on imports in the sector. India's share of the global aerospace industry is around \$250 million. It is still a fledgling industry but with high growth potential. As per a joint report by IESA, NASSCOM and Roland Berger the total opportunity in aerospace and defence market may touch around \$70 billion by 2029.

Opportunities abound

Giving wings to the Make in India policy is the number of private sector companies marking their presence in the aerospace sector through joint ventures. Examples include: Adani Aerospace and Defence which is setting up a modern aerospace ecosystem in Mundra, Airbus partnership with Tata Advanced Systems for final assembly of C295W military transport in India, Airbus partnership with Mahindra Defence for production of airbus military helicopters, Israel Aerospace Industries and Kalyani Strategic Systems joint venture to manufacture and market the Israeli firm's defence systems.

India's defence needs is still met through imports and it is one of the largest importer of conventional defence equipment. National security and geo-political requirements necessitate the need to build additional capacity through investments. The opportunity is knocking on the door and private sector could play a vital role across the aerospace and defence value chain in terms of research, design, development, manufacturing, maintenance, quality control, training, and so on. 

TRADE FAIRS: MORE THAN JUST A MARKETING INSTRUMENT

From gaining visibility to striking new deals, exhibitions and trade shows offer opportunities no business would want to miss out on. It is a strategy that has withstood the test of time, playing a significant role in the success of most machine tool companies that have been reaping rich dividends in terms of experience, product development, while forging relationships, building brand and, most importantly, bringing sales from new markets.

Trade shows are preferred

Exhibitions offer easy access to enthusiastic prospects open to research and deal, foster direct communication, real-time feedback and regional to global exposure that act beneficial in expanding a company's customer base.

It is simply a profitable choice of medium since none other has the potential to physically get one prospects or harness a company's assets or help set and achieve multi-disciplinary goals namely marketing, sales, relationship management or aid in knowing the market or one's position vis-à-vis the competition's, all at one go.

Choose and compare

Given the scope of trade events as export building platforms, it is crucial to choose the best one, establish key goals and measure the outcome against them, and then compare with other promotional methods. The targets should be made clear to the team along with the fact that the results are getting measured.

Evaluating exhibitions is not just about counting the collected visiting cards or the visitors registered in the stall; several things need to be measured at the same time -- the market, product and service, promotion, price and competition. Every exhibition is different for every exhibitor and no single measurement methodology will work for all. However, the effort should be to put together a simple methodology into a practical framework.

The best goals are the quantifiable goals since numbers motivate and drive action. For example, instead of the goal to get media coverage, it must be to get five articles or product reviews printed in the show daily since it is much easier to judge a performance against a hazy goal when stated in a measurable way.

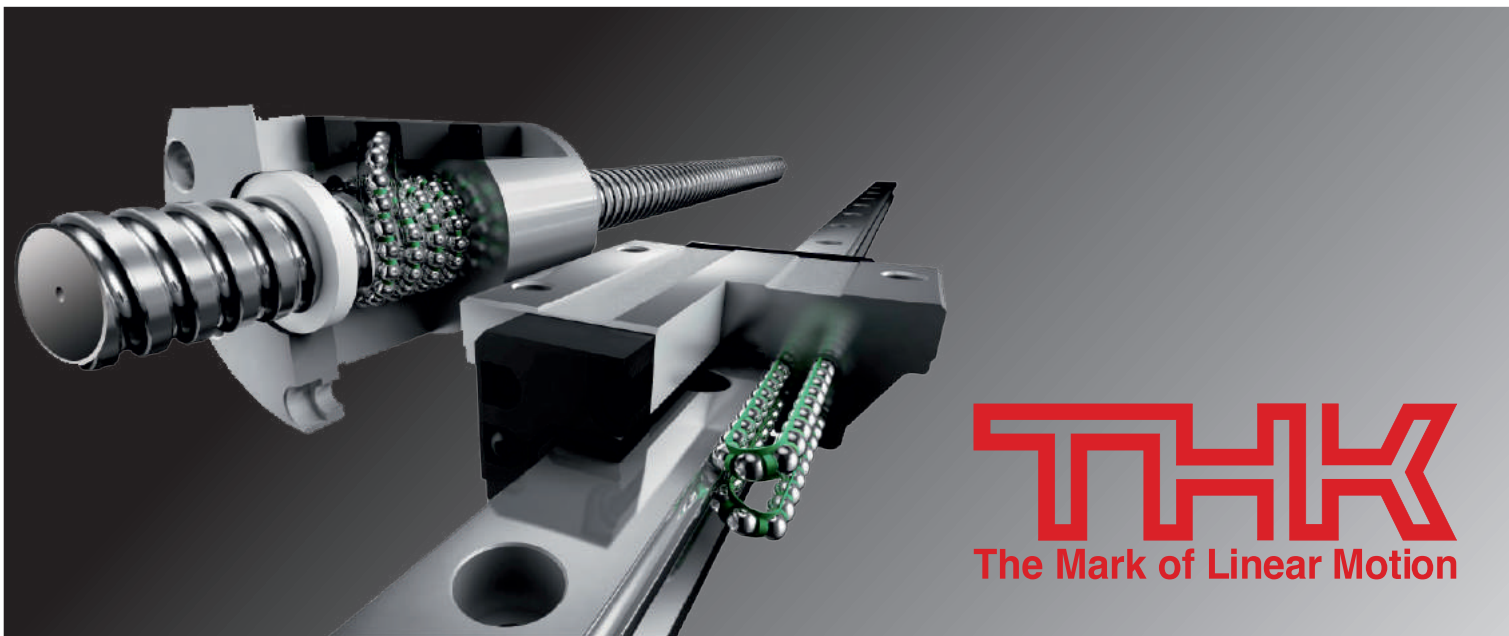
Post-event action

Once back in office, the results should be summarized and shared with the team. More leads, sales or benefits are likely to come in for months after an event. Hence, the show report must be kept updated and shared with key managers from sales, marketing and top management. This helps in realizing the value of participating in a trade event in the first place and making room for the improvements needed.

Exhibitions offer easy access to enthusiastic prospects open to research and deal, foster direct communication, real-time feedback and exposure that helps in expanding a company's customer base.

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

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



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IMTMA's 71st AGM

Bangalore, India - The 71st Annual General Meeting of IMTMA held recently at Banagalore International Exhibition Centre, witnessed President PG Jadeja appraise the performance of the Indian Machine Tool industry in the last one year while drawing attention to the Association's efforts instrumental in its progress.

Speaking on the occasion, Dr S Raghunath, Prof-Corporate Strategy and Policy Indian Institute of Management Bangalore (IIM) oriented the audience on the topic "Preparing for Transformations in Manufacturing Industries - Electric Vehicles' Impact on Machine Tool Industry" and Shailesh Sheth, Past President, IMTMA gave an

insightful presentation on IMTMA's Governance Policies. During the AGM, an announcement was made about P Ramadas, Managing Director, Ace Manufacturing Systems Ltd being the next IMTMA President-Elect and Indradev Babu, Managing Director, UCAM Pvt Ltd as the new Vice President, IMTMA.



Dr S Raghunath, Professor - Corporate Strategy and Policy, IIMB, addressing the audience during the 71st Annual General Meeting.



(L-R) L Krishnan, Managing Director, TaeguTec India Pvt Ltd & Past President, IMTMA; P Ramadas, Managing Director, Ace Manufacturing Systems Ltd; PG Jadeja, President, IMTMA and V Anbu, Director General & CEO, IMTMA during the AGM. Jadeja's remarkable contribution to the association during his tenure was acknowledged with a memento.

Source: IMTMA

Manufacturing sector bounces back

New Delhi, India - Purchasing Managers' Index (PMI) Data has revealed that the manufacturing activities in the country bounced back to growth path in August after having contracted in July due to the confusion pre-GST (the Goods and Services Tax).

The Nikkei India Manufacturing PMI rose to 51.2 in August from 47.9 points in July. A reading above 50 on the index denotes expansion.

"August's PMI results showed that manufacturers in India recovered quickly from the sharp slump that followed the introduction of the GST," said Pollyanna De Lima, Principal Economist at IHS Markit and the author of the report.

This ray of hope came on the heels of the release of gross domestic product (GDP) data that indicated a three-year dip in economic growth at 5.7 percent in the first quarter of the current financial year.

NITI Aayog's initiative to have mentors

New Delhi, India - The National Institution for Transforming India (NITI Aayog) - the premier policy 'Think Tank' of the Government of India, providing both directional and policy inputs - has launched the Mentor India Campaign, a strategic nation building initiative to engage leaders who can guide and mentor students at more than 900 Atal Tinkering Labs, established across the country as a part of the Atal Innovation Mission. Atal Tinkering Labs are dedicated workspaces where students from Class 6th to Class 12th learn innovation skills and develop ideas that will go on to transform India. The labs are powered to acquaint students with state-of-the-art equipment such as 3D printers, robotics & electronics development tools, Internet of things & sensors etc.

Adani, Saab collaborate for AeroDef

New Delhi, India - Swedish defence and security company Saab and Indian infrastructure conglomerate Adani Group have announced a partnership for defence manufacturing. The project would encompass design, development and production of Gripen jets for India in line with the Make in India initiative. It will combine the technical and product excellence of Saab, along with the industrial engineering, system integration and mega project execution capabilities of Adani with the intention to manufacture defence systems locally in India. Gripen is a modern multi-role fighter aircraft featuring state-of-the-art technology, including advanced data links and sensors plus a unique extensive electronic warfare suite. Gripen can perform all air-to-air, air-to-surface and reconnaissance missions with the most modern range of weapons and systems.

Meet on Sunshine Sectors

Pune, India – Yamazaki Mazak India Pvt Ltd and Seco Tools India (P) Ltd recently organized 'Innovation Days', a joint seminar on enhancing competitiveness in Aerospace and Medical sectors. The event focused on topics including machining of trending materials in Aerospace and Medical industries; latest machining

methods; component engineering solutions; digital solutions; and global competence centers.

As part of the seminar, a live demonstration was held on the latest machining trends on Mazak machines at Mazak Technology Center, Pune. Also a visit to the state-of-the-art Seco manufacturing facility was lined up.

A two-hour interactive session with international experts was scheduled to seek winning solutions for the various manufacturing challenges.

A host of industry experts such as Tom Massey, Regional Asia Pacific Expert, Aerospace & Medical; Vipin Rajput, Regional Asia Pacific Expert, Aerospace and K S Chong, Senior Director, Solution Engineering spoke on the topics exhaustively. Massey has decades of machining background in the Aerospace sector and Rajput specializes in Metal cutting.



A live demonstration on the latest machining trends on Mazak machines at Mazak Technology Center, Pune



An interactive session with experts

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VDMA celebrates its 125th anniversary

Cologne, Germany - With the aim to establish a network of contacts for the mechanical engineering sector, which was to communicate common interests with one voice, 29 machine factories in Cologne, Germany laid the foundations for the VDMA in 1892. Today, it is the largest industrial association in Europe with around 3,200 member companies.

For the anniversary, the website www.mensch-maschine-fortschritt.de shows in German and English in the form of multimedia reports how important machine and plant engineering is for everyday life. Almost every product is produced by machines, from nano to giga, in all dimensions and application areas. Topics of the reports are for example: energy supply, infrastructure and mobility, food supply and human-robot collaboration.

New PCD processing at EMO 2017

India - A new Neo laser roughing machine to preprocess polycrystalline diamond (PCD), cubic boron nitride (CBN) and other super-hard materials could be witnessed at this edition of Hannover. In conjunction with finishing the work piece on an Agathon grinding machine, companies will benefit from extremely short cycle times, low acquisition and production costs, as well as the technological advantages of industry 4.0 features. Visitors can visit Agathon in Hall 11, Stall C62 in EMO Hannover.

HAL to supply 41 Advanced Light Helicopters

Bengaluru, India - Hindustan Aeronautics Limited (HAL) has signed ₹6,100 crore contract for supplying 41 Advanced Light Helicopters (ALH)-40 to the Indian Army and one to the Indian Navy. The contract will be



Source: Department of Defence Production

executed in 60 months and adds to the 32 ALH ordered by the Indian Navy (IN) and Indian Coast Guard (ICG) in March.

"The order reflects the trust on HAL's capabilities and gives an impetus to 'Make in India' campaign. It reposes faith of Indian Defence forces in indigenous ALH which has been serving them with distinction for a long time," said T Suvarna Raju, Chairman, Managing Director, HAL. The indigenously designed and developed chopper is a twin engine, multi-role, multi-mission new generation helicopter in the 5.5 tonne weight class.

Hyundai to manufacture Verna in India

Chennai, India - South Korean automobile giant Hyundai Motors has announced that it will be shifting its entire production of its mid-sized sedan Verna from South Korea to India.

The move is expected to boost the "Make in India" initiative. The manufacturing facility in Sriperumbudur near Chennai will start supplying Verna to nearly all of Hyundai's global markets from January 2018. YK Koo, Managing Director, Hyundai Motor India disclosed that they are targeting annual production of about 1.3 lakh units of the mid-size sedan in India in the next few years. The company also hopes to export 60 to 70 percent of those units. Its factory currently operates at 95-98 percent of capacity. It plans to manufacture around 50,000 units of Verna for the Indian market and another 80,000 units for global markets, including Latin America, Africa, Middle East and other Asian countries.

Schneider Electric India commissions 720 kWp solar plant

Vadodara, India - Schneider Electric India recently announced the commissioning of a 720 kWp capacity solar power project at its manufacturing facility in Vadodara, Gujarat. The solar project, built on a rooftop area of 6,000 sq mt, covers almost 45% of the total factory load and will produce over 1.05 million units of electricity per year which would help cut power costs by as

much as 20-25% annually. Further, the company will be able to cut its carbon dioxide emissions by 1,018 tonne per year, which is equivalent to planting 50,000 trees.

The project demonstrates its commitment towards green manufacturing in India. This is the second solar project commissioned by Schneider Electric at its manufacturing facility in India.

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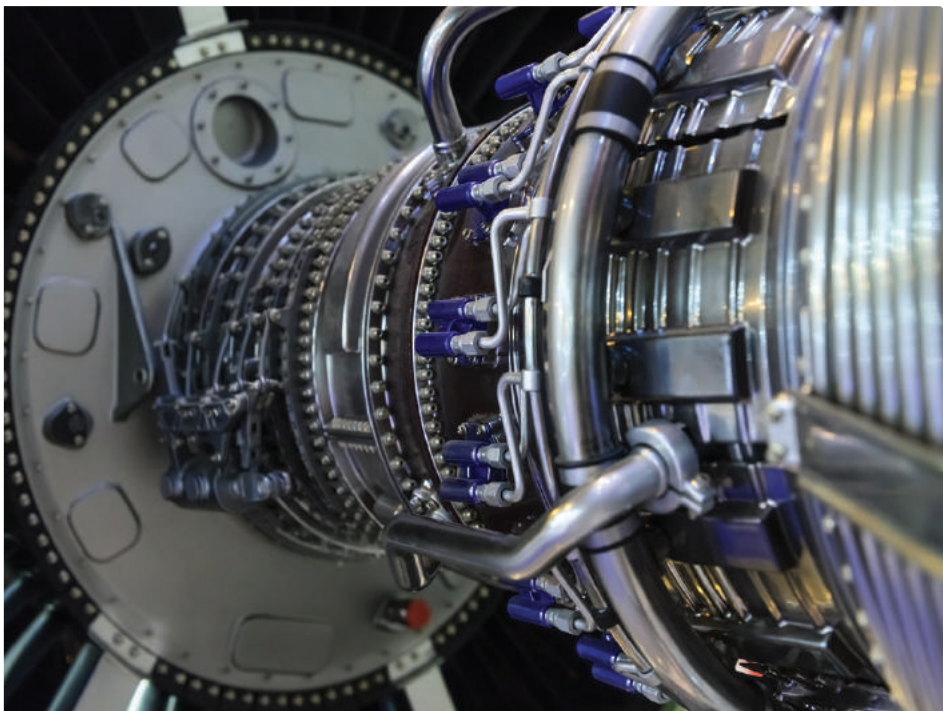
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HIGH DEMAND IN AEROSPACE INDUSTRY A BOON TO MACHINE TOOL MARKET



A strong global growth of both passenger and freight air transport demand followed by strong demand for new aircraft and increasing competition between aircraft manufacturers point to a robust aerospace market in the near future, with opportunities galore for machine tool builders.

The global aviation market represents a significant source of future growth for the machine tool market.

Multiple market forces are working to the advantage of the aviation market, representing a significant and sustainable growth opportunity for machine tool builders. These forces include the strong global growth of both passenger and freight air transport demand followed by strong demand for new aircraft and increasing competition between aircraft manufacturers. The combined results of these factors should

point to a robust aerospace market for years to come that may present opportunities for machine tool builders to make long-term investments and grow their businesses.

Robust backlog

Backlog orders across the industry are robust with the combined backlogs of Airbus and Boeing exceeding 12,000 aircraft. This backlog is split evenly between the two rivals. The value of all these planes is

likely in excess of \$2 trillion, as Airbus stated in mid-2017 that its backlog value alone exceeds \$1 trillion. To clear the total backlog using recent annual delivery data from both firms would take more than 8 years. This estimate does not account for future expected orders, cancellations or expanded manufacturing operations. Lastly, these figures do not account for aircraft orders and deliveries by other firms such as Mitsubishi, Bombardier or Embraer.

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Narrow body jets successful

In a June 2017 release from Boeing, the company stated that it will produce a modified 737 called the "737 MAX 10" to compete with the successful Airbus A321Neo. Both planes are designed to fill the "middle of market" (MOM) passenger jet segment. MOM jets are described as narrow-body aircraft, meaning they are single-aisle jets less than 4 meters across. A MOM jet is typically capable of carrying approximately 200 passengers depending on the cabin configuration and number of seating classes. In June, competing jet engine manufacturers General Electric and Safran both indicated that they stand ready to provide new high-efficiency engines for Boeing's new jet.

The Airbus A321—a member of Airbus' A320 family of narrow body jets—has been extremely successful for Airbus. According to Airbus website statistics as of June 16 this year, the A320 family of jets comprised 75 percent of the company's current orders and deliveries. In total, Airbus reported in June that it has more than 5,050 firm orders for planes using Neo engines. Boeing's response to Airbus' success, however, will not be immediately felt until capacity at Boeing's manufacturing facilities is freed up from the completion of existing orders for its 777X and 737 MAX planes.

The Chinese state-owned Commercial Aircraft Corp. of China (COMAC) is also bringing its own narrow-body jet, the C919, to market in the near future. The C919 which will carry fewer than 200 passengers, made its first flight in May 2017 and is expected to enter service in 2020.

Increase in passenger growth

Passenger and freight statistics produced by the World Bank and China's National Bureau of Statistics are highly impressive. Data from the World Bank indicates that the worldwide number of passengers on planes from 2005 to 2015 increased by almost 75 percent. Worldwide growth as measured by this metric showed significant variation by nation. In the US, total passenger growth increased by 11 percent, while China experienced total growth of 219 percent, representing 12.3 percent annual growth.

According to data released in April 2017 from China's National Bureau of Statistics and seasonally adjusted (SA) by Gardner Business Intelligence, in the five years ending April 2017, Chinese passenger-kilometers traveled increased by 88 percent, representing more than 13 percent annual growth. Similarly, Chinese air transport of freight measured in ton-kilometers increased

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The international demand for aircraft and air transportation is reflected in the volume of shipments for aircraft components requiring machining.



Source: shutterstock.com

by 51 percent during the same time, representing almost 9 percent annual growth. These impressive growth statistics are supported by comparable aviation data gathered by the World Bank.

Increase in the value of aircraft components

The international demand for aircraft and air transportation is reflected in the volume of shipments for aircraft components requiring machining. The value of aircraft components including pumps, motors and actuators have increased thanks in small part to new aircraft production, but largely as a re-

sult of increasing demand for air services. Using data for the five years ending in April 2017, the value of power cylinders and actuators shipped grew by 12.9 percent on an annual basis, while the value of pumps and motors shipped increased 5 percent annually.

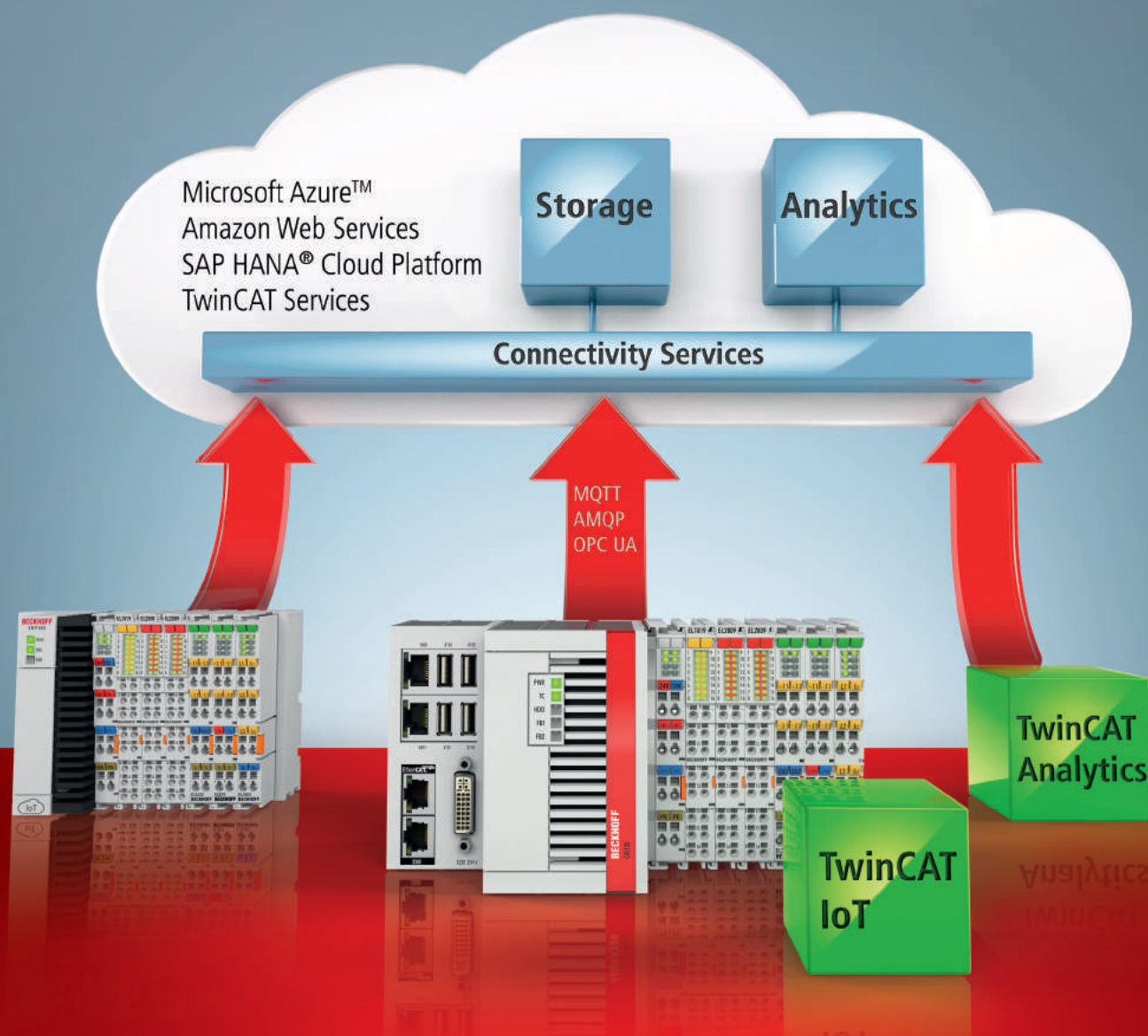
Looking to the future, GBI expects the aircraft components industry will experience continued growth as low operating costs and a growing worldwide population of air-travelers powers the expansion of the worldwide aviation market. As the flying population continues to grow, this will create strong demand for new and reconditioned

jets able to transport more people to more destination pairs. Technological advancements which have brought geographically diverse sources of oil from shale rock formations and deep-sea deposits to market will limit OPEC's ability to inflate oil and jet fuel prices. The dynamics of the oil market moving forward will result in airlines being able to profitably sell seats to cost conscious travelers, driving the quantity of seat-miles consumed even higher. We expect this combination of a growing consumer base and low operating costs to benefit the aerospace components manufacturers and the OEMs well into the future.

Aviation industry important for machine tool market

The global aviation market represents a significant source of future growth for the machine tool market. It will be important for machine tool firms to build international relationships that will allow them to capture market share and growth in those regions of the world that are experiencing double-digit demand for air transportation. If aircraft manufacturers such as Boeing, Airbus and others are going to run their facilities at ever higher levels of capacity for the next five or more years, it will be important for their component suppliers to have strong operational and logistical capabilities to support these demanding aircraft delivery schedules. This will mean that machine tool providers will also need to be prepared to meet the growing and highly demanding needs of their customers at all levels of the aerospace manufacturing supply chain—having new equipment ready for sale and to be able to quickly support existing equipment maintenance and repair needs. 

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Industry 4.0: Manufacturing's Next Move

The Industry 4.0 concept will be ushering in a favorable sea change in the world of manufacturing. However, for the small and mid-tier enterprises (SMEs) to make the most of its phenomenal digital opportunities, the trend requires more openness in the machine tool industry and in the user sectors involved.

Industry 4.0 is influencing the process chain in two ways: firstly, in terms of technology and engineering, and secondly in terms of the data flowing along with it. When both of these interact to optimum effect, a

textbook example for Industry 4.0 is obtained.

"This applies in regard to quality and disturbance variables, but also and increasingly to predictable parameters such as tool paths and tool lifetimes, achievable surface qualities, and for



"I would like to see even more shared projects with partners from the academic community and the industrial sector representing a highly disparate range of scientific disciplines, which elucidate questions not least with the aid of live demonstrators, for example."

Dr Frank Barthelmä
Executive Director and Institute Manager of the German Society for Production Technology and Development, GFE



"In future, tool data will be acquired over the entire life-cycle. This applies particularly to tools that are re-sharpened or retrofitted."

Markus Kannwischer
Head-Technique and Member of the Board at the tool manufacturer Hartmetall-Werkzeugfabrik Paul Horn GmbH, Tübingen

maintenance intervals for machines and lines," explains Prof Dr Frank Barthelmä, Executive Director and Institute Manager, GFE – Gesellschaft für Fertigungstechnik und Entwicklung Schmalkalden e.V.

Ideally, users receive all important information on the entire spectrum of process-related factors. What is more, all data available can now be recorded and evaluated in real-time, and control loops created, so as to upgrade the efficiency of the processes and the quality of the products involved, thanks to more transparent metal-cutting.

Role of tool sensors and actuators

About a decade ago, there was an ongoing debate on whether or when a tool can be classed as intelligent. Today, within the context of Industry 4.0,

intelligent holistic solutions are talked about in which tool sensors and actuators play an important role. "That correctly makes them 'state-of-the-art,'" stresses Dr Barthelmä. "Not only in terms of using increasingly miniaturized and more energy-efficient sensors or actuators in the tool itself, but also with a view to their utilization in the overall system comprising the tool, the machine and its control system, and the application concerned."

Evaluating multiple data

Many potential users of intelligent solutions, especially SMEs, are sometimes unable to assess what data they actually need in order to render their technology/IT fit for purpose, and to generate from these new production lines when needed. This extends to new business models that may prove

necessary. Universities and large corporations are already well advanced in this respect, whereas many of the small and mid-tier companies are still in the exploratory phase. For meaningful analysis, moreover, a comprehensive data history is required, in order to correlate it with new key statistics.

According to Dr Barthelmä, we need an even more collaboration between the academic and business communities when it comes to generating new ideas, models and new solutions. Ideally, there should be more joint projects involving partners from the academic community and the industrial sector representing a highly disparate range of scientific disciplines, which can elucidate these questions with the aid of live demonstrators.

Collaboration between software analysts and metal-cutting experts

This will work if the SMEs get involved at an early stage. The networks supported by the Federal Ministry of Economic Affairs, for instance, have proved worthwhile in this context. For example, the GFE is currently a partner in the SME 4.0 Competence Centre of the Ilmenau University of Applied Science, and in a model factory is addressing problems encountered with data generation and data transfer in connection with metal-cutting – for transfer especially in SMEs. The question involved here is this: how can a control loop in the machine be utilised so as to ensure that quality, efficiency and productivity can serve as controlling target variables?

All available data can now be recorded and evaluated in real-time, and control loops created so as to upgrade the efficiency of the processes and the quality of the products involved.

Source: VDW – VDW – German Machine Tool Builders' Association
GFE – Gesellschaft für Fertigungstechnik und Entwicklung Schmalkalden e.V.



Source: GFE

Looking into the future: at the EMO Hannover, the GFE will be showcasing the current status of digital matters as exemplified by the EU project entitled "Dyna-Tool – Enhanced Efficiency in Metal-Cutting Applications"

Analysing metal-cutting parameters

In the case of new materials, it is becoming progressively more important to close the loop in the control circuits with the aid

of analytics. "There is still quite a bit of work to be done on the path to purposeful evaluation. There is room for improvement, too, in the transparency of the results. A pre-competition platform should be accessible to manufacturers and users alike," opines Dr Barthelmä. A data pool should also be in place so that everyone does not have to keep on re-inventing the wheel. It is worthwhile for a manufacturer if users learn which of his tools are best suited for efficiently machining new materials. GFE is contributing towards this with the SME 4.0 Competence Centre.

Current highlight from the work

The EU's "Dyna-Tool – Enhanced Efficiency in Metal-Cutting Applications" project, supported by the German Engineering Federation's Precision Tool Association and the research institute Forschungsbüro Maschinenbau e.V., is tasked with investigating how vibration-stable metal-cutting processes can be designed using sensor technology in the tools and the tool holders.

For this purpose, GFE has with-

developed a sensor-integrated tool for hard machining, which, thanks to direct integration in the machine's control, enables the process to be controlled almost in real-time.

The Dyna-Tool consortium has succeeded in putting more transparency into the metal-cutting process, so that it can be kept within defined limits for low vibrations, but at the same time is able to exploit its performative potentials to the full.

GFE is also currently examining the integration of high-resolution metrological devices in the tool, including an interface with the control system, so as to use this to create a real-time control loop. Anyone interested can learn more about this and other projects at the EMO Hannover and its forum entitled "Innovative Solutions for Industry 4.0" hosted by the German Engineering Federation's Precision Tool Association.

I4.0's influence on metalcutting

Dr Niklas Kramer, Director Product and Industry Segment Management, Sales Area Central Europe, Sandvik Coromant, gives three reasons why Industry 4.0 is influencing the world of metal-cutting: "Firstly, it focuses attention on the value-adding processes involved, since resource-gobbling activities around the actual production process can hopefully be automated to an increasing extent using I4.0."

"Secondly, metal-cutting is a highly empirically-based field. The more we succeed in gaining insights either on the basis of data or by means of statistical methods, the better we shall be able to design and optimise metal-cutting processes," he adds.

Lastly, the sector is nowadays

EMO Hannover 2017

- » EMO, the world's premier trade fair for the metalworking sector will be held in Hannover, from September 18-23, 2017. The fair will be showcasing the entire bandwidth of today's most sophisticated metalworking technology, the latest machines, efficient technical solutions, product-supportive services, sustainability in the production process, and much more.
- » The 2,000 manufacturers from 42 countries will be presenting the entire assortment from machine tools, precision tools and automation components up to customer-oriented systems at the fair. However, it is the key focus on digitization and Industry 4.0 this year that makes it a 'must-attend' affair.
- » EMO's spotlight on the concept will help overcome the skepticism around this emerging trend, better understand the reasons it is gathering force and thus, take advantage of the new opportunities. Join the historical congregation as it gears towards another industrial revolution.



Source: GFE

exhibiting a major gap between metal-cutting research and practical applications. A modest plus in terms of system intelligence would be helpful here, whether it is an I4.0 machine or a process monitoring system, for example, enabling better decisions to be made faster, and deviations to be detected earlier.

Cloud instead of a physical tool ID

Similar developments are also taking shape in Tübingen at Hartmetall-Werkzeugfabrik Paul Horn GmbH. "In future, tool data will be acquired over the entire life-cycle," says Markus Kannwischer, Head of Engineering & Member of the Board. "This applies particularly to tools that are re-sharpened or retrofitted." In these cases, all relevant geometric data shall then be transferred to the cloud; a physical tool ID is thus superfluous. The tools are changing too: there is an accelerating trend

towards sensor technology, that in the tool, in the vicinity of the blade, acquires, processes and transmits measured values. From these data, algorithms are then tasked with drawing conclusions on machining parameters and regulating the control systems accordingly. To quote Kannwischer: "Ideally, it will no longer be necessary to enter feed and setting values in the control system; rather, the tool itself will continuously send information on its condition and the control system will take appropriate action."

Real trials are not passé

But the virtual future is not rendering real trials superfluous. For example, the machinability of new materials will still have to be determined by actual trials, despite simulations and analytical methods. However, the number of trials can be restricted because a better data basis is available. Generally,

Transferring ideas: digital transformation is a difficult undertaking, especially for small and midtier companies. It may prove helpful for them to tackle the issue jointly in networks, as is the case here at the GFE in Schmalkalden.

though, a solid basis of data will allow a tighter process window when running in workpieces involving familiar materials.

Networking at EMO

Acquiring the metal-cutting parameters also facilitates machining – e.g. with a view to new materials. "Often they are not very amenable to metal-cutting because the empirical knowledge and the research results are not available, or we first of all have to try out the old solutions before we develop any new ones," explains Dr Kramer. "I believe that if we could bring together the global first tentative steps involving a new material at a single location, we would have significantly steeper learning curves. One aspect we're generally focusing on in the context of Industry 4.0 is rapid response based on simply edited data."

On this subject, Sandvik Coromant will be showcasing design enhancements of the CoroPlus platform at the EMO Hannover 2017, which offers its users networked solutions for increased process dependability and savings in terms of design and planning. To quote Dr Kramer: "Since 2016, quite a bit has been firmed up and design-enhanced, so we are hoping that this time, like at the last fair, we will once again be able to elicit an enthusiastic response."

Meanwhile, Dr Barthelmä, with his primary interest in the examples of best practices, will be seen talking to other advocates of these ideas on more transparency at the event: "I shall thus be attempting at the EMO Hannover, within the context of my networking activities, to gain additional co-campaigners for more openness and transparency in the sector." 

CREATING RIPPLES IN THE MANUFACTURING SPACE



Source: CECIMO

“The theme chosen for the 2017 EMO edition cannot be more indicative of the trends we see today in advanced manufacturing.”

Luigi Galdabini,
President,
CECIMO, The
European
Association of
the Machine
Tool Industries
& Managing
Director,
Galdabini SPA

As we come close to witnessing the latest in manufacturing trends at EMO Hannover 2017, Luigi Galdabini, President, CECIMO, the European Association of the Machine Tool Industries & Managing Director, Galdabini SPA, helps us do our homework on the emerging technologies poised to transform the ways of doing business in the machine tool space.

How should the machine tool sector keep pace with the changing requirements of the digitized manufacturing sector, especially in terms of implementing new business models such as “product-as-a-service” or “knowledge-as-a-service”?

LUIGI GALDABINI: As the cost pressure increases, customers are continuously looking to maximize their overall equipment effectiveness (OEE). In Europe, machine tool builders are increasingly realizing that, as key players in several value chains, they can make the most out of this overarching digitization trend. Through data storage and analysis, digitization gives us many opportunities to expand our portfolio of customer solutions. We are now able to offer add-on services together with the high-performance machines for which we are renowned. For example, condition monitoring sensors allow the customer to track down the status of a range of aspects of the machine and thus boost its productivity. Or predictive maintenance solutions can dramatically diminish machine downtime for the customer. From a supplier perspective, these are just a few practical examples of the many digital paths that the European machine tool industry is taking. In all that, it will be important to get a sense of the customer's needs in order to offer tailored digital services.

In a competitive market, how can machine tool builders leverage the best out of available opportunities and be on the winning edge in terms of providing innovative solutions to customers at an economical price?

GALDABINI: Digitally speaking, European machine tool builders should not delay the development of their strategy to remain competitive in the market. Indeed, the array of possible data-related services is quite heterogeneous, so companies will need to tailor their approach in accordance with their own strengths. Some European machine tool firms will want to position themselves as suppliers of high-quality machine tools in combination with digital solutions to exploit machine's generated data so to improve production.

A common underlying element in all these strategies should be, as said before, closeness to the customer. Collaboration with end-users is essential to make them aware of the benefits of digital services for their business. In this sense, machine tool builders will need to work with them on real-case applications of these services so to demonstrate their added value.

In this process, we should not forget that entering the digital services' realm requires investment in talent. There will be a need to strengthen the digital expertise of the existing workforce and implement HR strategies aimed at attracting key IT experts for the creation and marketability of a customer services' portfolio.

Speaking of innovation, which production technologies do you think will predominantly prove to be game changers in the manufacturing sector?

GALDABINI: In addition to digitization, additive manufacturing (AM) and robotics

are two technologies that will significantly impact the manufacturing sector

Additive manufacturing is likely to have a significant impact by enabling mass customization, reducing inventories and cutting time-to-market. Our companies represent some of the leaders in the production of metal additive machines for industrial use, as well as of hybrid systems where additive and subtractive techniques are integrated in a single set-up. Additive manufacturing will be a game changer, but it will not displace high-performance, traditional machining or cutting techniques already familiar with volume production. Additive machines should rather be complementary to subtractive systems on the shop floor.

Regarding robotics, we are noticing the emergence of more collaborative robots able to work together with people to further increase flexibility and efficiency. They are capable of boosting the productivity of a factory by executing a range of supporting tasks, like handling.

In the future, the key will be to integrate traditional and innovative technologies to develop overall efficient process chains.

Additive Manufacturing market is slated to touch \$21 billion by the year 2021. In this context, how should the manufacturers gear themselves to upgrade their skill sets to run in the race?

GALDABINI: The growth of industrial additive manufacturing points to many opportunities for machine tool builders. Production with additive machines entails challenges of its own, which require strong skills to be mastered with effectiveness. Thus, new competences, specific to the characteristics of the additive process, have emerged, though the European machine tool sector, relying on the excellence of its workforce, has



Second from left: Luigi Galdabini, President, CECIMO, the European Association of the Machine Tool Industries & Managing Director, Galdabini SPA addressing the first EU Industry Day

all the tools to succeed in the additive space. In the advanced manufacturing context, the mix between solid engineering know-how and highly skilled shop floor employees has been one of the main ingredients for our leading position. European machine tool companies willing to enter the additive industry are already in a strong starting point for successfully thriving into it. Indeed, looking at the additive market, I can say they are already proving so.

CECIMO considers the skills issue in additive manufacturing a priority and we have obtained EU funding for a series of projects on the topic. One of them is MET-ALS, which investigates further to what degree the workforce in our sector should be trained to interact with additive machines. We are in the process of understanding the competences that can be transferred from the subtractive to the additive environment, and those to be acquired by workforce from scratch.

The projects' results will not only strengthen our knowledge of the industry from a skills' perspective, but will also contribute to the European

policy-making process. We want to show authorities which measures in the education domain they should take.

CECIMO is organizing an international conference on AM during the EMO show. What is the objective behind holding the conference at the fair?

GALDABINI: Through this event, CECIMO intends to raise awareness of the critical developments happening in industrial additive manufacturing. Innovation is spanning across the entire value chain. New production techniques are being developed by machine manufacturers, and new applications are emerging in mainstream industries. The event aims to highlight some of the most relevant developments in the field.

Our association represents manufacturers at the cutting-edge of technology development and we have a long tradition of R&D projects at EU level. The CECIMO additive manufacturing conference at EMO 2017 has been conceived with these considerations in mind.



The interview was conducted by:
Soumi Mitra, Editor-in-Chief

“Additive manufacturing will be a game-changer, but it will not displace high-performance, traditional machining or cutting techniques already familiar with volume production.”

Luigi Galdabini



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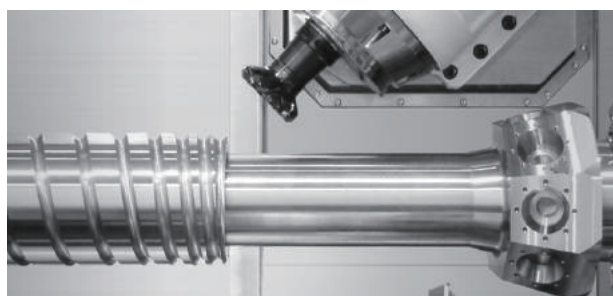


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Source: Magic Wand Media Inc

Post India's major economic reform, GST, many a foreign company is getting drawn to India for mutual trade gains. Europe's second biggest manufacturing hub, Italy has also recognized opportunities in the country's industrial sectors and is on the way to beef up the bond.



cantly getting Italy's biggest trade and investor delegation to India to boost bilateral relations in its areas of expertise including food processing, infrastructure, heavy machinery, automotive, renewable energy.

advanced technology, as well as information and communication technology. Italy is currently 13th largest investor in India with over 600 Italian companies present here. And Italy is India's fifth

trading partner in EU. The bilateral trade in 2016 amounted to around €7.3 billion and Italian foreign direct investment in India amounts to around €5 billion.

Machine Tools scene

The Italian machine tool exports to India reached its all-time high in 2012, when sales amounted to €147 million. The trend had a progressive reversal post this. In 2016, sales did not exceed €70 million, making India the eleventh market of destination for the Italian product offering of the sector, from being seventh in 2012, noted Massimo Carboniero, President, UCIMU-SISTEMI PER PRODURRE, Italian Machine Tools, Robots & Automation Manufacturers Association.

“Despite the registered downturn, India always remains a very important market for the Italian manufacturers worldwide,” he added. Hence, the association is involved in an intensive activity aimed at promoting the sector’s Made in Italy within this area. This materializes in specific actions, such as those developed in partnership with Indian Machine Tool Manufacturers’ Association (IMTMA), or those carried out by PLATFORM INDIA that provides assistance and advice to the Italian enterprises interested in working in the area. ITC India, Italian Technology Center deserves a particular mention: With regard to the technologies requested by the market, the Indian users are interested both in metal cutting



“There will be a wide and comprehensive display of technologies related to Industry 4.0 from 270 participating companies from Italy. I would like to invite the readers of ‘Modern Manufacturing India’ to visit the stands of these companies and witness their interesting novelties.”

Massimo Carboniero
President, UCIMU-SISTEMI PER PRODURRE, Italian Machine Tools, Robots & Automation Manufacturers Association



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In 2015, Italian imports from India increased by 51 percent compared to the previous year. Around 91 percent share of imports is related to the sector of cutting machines, particularly machining centers and milling machines

machines: grinding machines, non-conventional technologies and machining centers, representing 61 percent of total exports; and in metal forming technologies: folding machines, bending machines, trimming machines and presses.

"A constant growth is registered with regard to the Italian imports from India that has now become one of the major manufacturing countries in the world, capable of ensuring a satisfactory technological level for many types of machining, especially for the machines with a medium technological degree," said Carboniero.

In 2015, Italian imports from India increased by 51 percent compared to the previous year. Around 91 percent share of imports is related to the sector of cutting machines, particularly machining centers and milling machines.

Italian offerings for aerospace sector and medical engineering

"The Italian products of the sector are well-recognized for their

high standards and strong customization," he shared. However, due to the incentives offered by the Italian Government, the enterprises of the sector have been working intensively on the technologies of Industry 4.0 that are increasingly being integrated in the solutions made in Italy. "This is all for the users' benefit; they actually have at their disposal not only

well-performing and easily reconfigurable machines, but also systems capable of interacting within a factory according to the principles of a more and more extended digitalization," pointed out Carboniero.

UCIMU plans at EMO Hannover

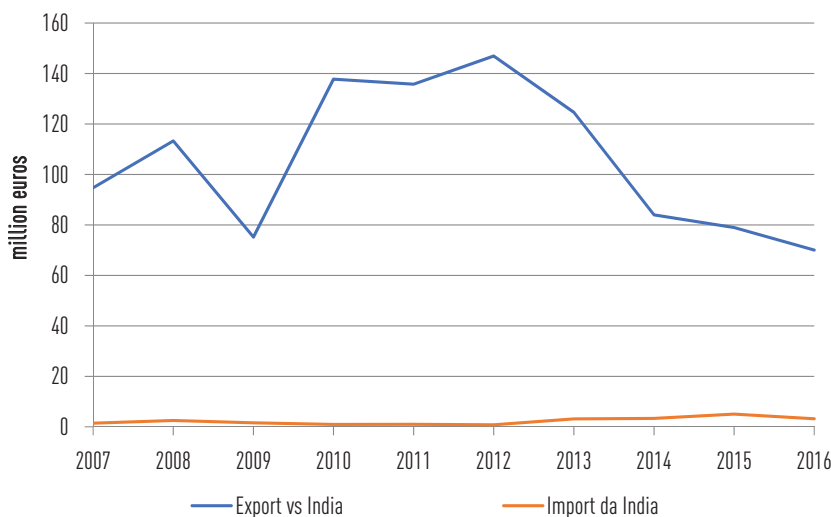
With massive work underway for making Italy Industry 4.0 ready, the country is looking forward to be an active participant at EMO Hannover 2017, which has its special focus on the advanced manufacturing trends. As a testimony to its high importance to the Italian manufacturers, 270 Italian companies are to showcase their innovative developments in the area. "The Italian enterprises will certainly not miss the opportunity to show themselves to the international public that is coming to Hannover over the six exhibition days," said the President. "Considering the positive context and the strong acceleration, I am sure that EMO HANNOVER will turn out to be a profitable occasion for all players, in particular for the Italian enterprises."

MACHINE TOOL EXCHANGE ITALY - INDIA

(thousand euros)

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2007	94.715	64,8%	1.441	-43,2%
2008	113.281	19,6%	2.485	72,5%
2009	75.189	-33,6%	1.573	-36,7%
2010	137.778	83,2%	941	-40,2%
2011	135.770	-1,5%	1.003	6,6%
2012	146.941	8,2%	817	-18,5%
2013	124.595	-15,2%	3.119	281,9%
2014	83.985	-32,6%	3.349	7,4%
2015	78.979	-6,0%	5.057	51,0%
2016	70.039	-11,3%	3.196	-36,8%

Source: elaboration on ISTAT data



Source: elaboration on ISTAT data



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SHOWCASING INDIA'S MANUFACTURING PROWESS

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With a growing strength in the manufacturing sector and the government's encouraging initiatives, India seems to be soon realizing its dream of becoming the next manufacturing destination. Being part of the EMO Hannover 2017 will help gain the much-needed exposure for us to explore contemporary trends and for the world to realize our potential.

In the pursuit of transforming itself into a manufacturing powerhouse, the country has been encouraging domestic and multi-national companies to manufacture their products in India, thus expanding its economy along with its

industrial output. Through the "Make in India" initiative by the government, new horizons have opened up for the home-grown players who are now all set to prove their mettle to the world with their cost-effective, yet high-quality products and technologies.

EMO Hannover 2017, the world's premier trade fair for the metal working sector, is a great opportunity for the Indian manufacturers to represent all the players back home and promote the nation's strengths in the sector.

The Indian export figures so far give a bright picture and make India a suitable candidate to be part of a trade show of such stature.

According to German Engineering Federation (VDMA), the bilateral trade between India and Germany grew to € 17.42 billion in 2016 from a figure of nearly € 17.29 billion in 2015. Indian imports from Germany amounted to € 9.8 billion. The exports from India to Germany attained a value of € 7.62 billion in 2016.

Lucrative Indian market

India, today, shares spotlight with the world's largest machine tools markets and ranks 8th among them. Over the past three years, the subcontinent has further extended its overall machine tool consumption volume by almost a fifth, reaching a volume of € 1.7 billion in 2016, corresponding to a growth of 11 percent in euros. For 2017-2018, too, a continually moderate increase in consumption is predicted, thus making it an attractive, high potential market with the need to be focussed upon at the EMO.

The fair is being held at Hannover, Germany from September 18-23, 2017, after a gap of four years. It is being organised by the VDW, Frankfurt am Main, Germany on behalf of the European Association of the Machine Tools Industries from Brussels, Belgium and in conjunction with Deutsche Messe AG, Germany.



"IMTMA provides opportunity to forge alliances with foreign entities, develop technological capabilities within the country and supplement our export potential. This bodes well for India's manufacturing industry as well as 'Make in India' initiative."

P G Jadeja,
President, IMTMA &
CMD, Jyoti CNC Automation Ltd



"IMTMA will have a strong presence in the show representing Indian companies, connecting with industries and associations through various forums such as 'India Day', and disseminating information through the stalls of Indian companies participating in the exhibition."

V Anbu
Director General & CEO
IMTMA



"The main aim of the India Day is to showcase the possibilities that India offers, especially for the machine tool and cutting tool manufacturers in sectors like automotive, aerospace and general engineering."

Rajesh Nath
Managing Director
VDMA India

Jai Ho at EMO!

To celebrate India's growth in the manufacturing sector and explore factors contributing to a probable industrial revolution, a session, 'India Day' is to be hosted by the VDW, German Machine Tool Builders' Association, at the event on 20 September. The EMO's India Day will also be supported by the Indian government. The event will also play host to six delegations of high-ranking Indian entrepreneurs, which will be organised and accompanied by various Indian customer associations and India VDMA office.

Representatives from Indian user sectors will be addressing technical and commercial trends from the automotive and aviation, and mechanical engineering industries. Rajesh Nath, Managing Director, VDMA India will be moderating the overall event.

India at its manufacturing best

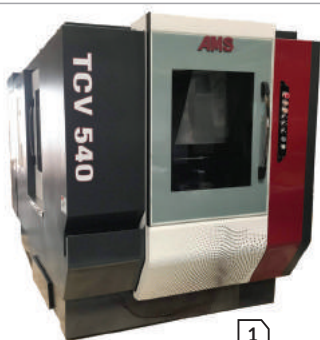
The Indian exhibitors at the EMO 2017 are all set to wow their global counterparts with their innovative display.

Ace Manufacturing Systems Ltd
Hall: 17, Booth: F07

AMS will be displaying a high-

speed drill tap machining solution with a high-speed pallet change feature. It provides low chip to chip times and also masks the component exchange time with the pallet changer. This product is most suitable for high volume components with short machining times and for applications demanding frequent tool changes with multiple drills and taps to be performed on the components. The versatile machine has the ability to cut components of different material compositions to suit specific applications. Such machines are widely required in the auto component and the electronics manufacturing industries.

- 1 TCV-540
- High Speed
Drill Tap
Machining Center
- 2 Direct Drive
Automated
Carbide Rod
Cutter
- 3 Totem tools
portfolio



1

Source: Ace Manufacturing Systems Ltd



2

Source: Chemat Metco Pvt Ltd



3

Source: Forbes and Company Ltd



"India is now positioning itself as a source for reasonably priced alternatives to high volume machine tools. However, in coming months, Indian manufacturers would incorporate higher levels of intelligent production capabilities in tune with the changing scenario in manufacturing."

C Renganathan
Director
Chennai Metco

Chennai Metco Pvt Ltd
Hall: 6, Booth: E 42

The company will be showcasing its direct drive cutter developed in collaboration with IIT Madras and supported by MHI. It will also be displaying automatic carbide cutters / metallography preparatory machines.

Forbes and Company Ltd
Hall: 4, Booth: F96

Forbes will exhibit its: high-performance taps for aerospace, and automotive sector; applications for difficult-to-machine materials and the ever-increasing use of stainless steel for valve and processing industry and threading tools for super alloys; end mills for



"Additive Manufacturing, also known as a disrupting manufacturing technology, has been gaining momentum in the recent past. This is an opportunity for Indian machine tool manufacturers to diversify and not be left behind."

Indradev Babu
Managing Director
UCAM Pvt Ltd

aerospace, die & mould and for graphite machining; and high-performance drills up to 36D for a variety of industries.

Grind Master Machines Pvt Ltd
Hall: 11, Booth: A65/A67

Grind Master along with its French subsidiary SPMS will be showcasing Supramatic range of superfinishing machines for Powertrain Shafts. Using modular elements including MBA series superfinishing modules, the CMA series machine generates precision engineered surface finish and geometry characteristics on automotive powertrain shafts such as input and output shafts of gearbox. With automation for loading/unloading including



"Machines with specialised and intelligent features such as auto diagnostics, remote scheduling & programming, adaptive cutting, built-in gauging and auto correction will provide an enhanced experience to the user in the coming days."

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

conveyor systems etc., it is built for high volume production and is used by leading automotive OEMs globally including Europe, South America, China etc.

Jyoti CNC Automation Ltd
Hall: 27, Booth: D70/D78

Jyoti CNC's exhibits range from speed-oriented compact foot print machines to sophisticated multitasking machines. It also includes a new avatar of its largest selling variants DX 200 as DX 200 nvu and VMC 850 as VMC 850 nvu, which are much advanced and improved Gen-Next machines. A highly sophisticated high precision Turn Mill Center AX 300, Tachyon 7 is yet another state-of-the-art

1 SPMS
Supramatic
CMA Series
Superfinishing
Machine

2 Multi
Tasking
Machine
MTX 300

3 MOBIMARK
- the cordless
Marker

4 UDDR-
450-TN



1



2



3

Source: Grind Master Machines Pvt Ltd

Source: Jyoti CNC Automation Ltd

Source: Stamp IT Robotai & Solutions Pvt Ltd



“Indian manufacturing companies are working on adopting Industry 4.0. Technologies emerging in this space from India are likely to be highly innovative, cost-effective and applicable in global manufacturing companies.”

Sameer Kelkar
CEO and R&D Director
Grind Master

high dynamic Drill Tap Center focused on Automobile and Electronics sector. The K Mill 10, exclusively built for catering to the requirements of high-end Die Mould application and a battery of high-tech 5-Axis machines namely K3X8 (Five) nvu, U Mill 5 and 6, 5-Axis Double Column Machining Center KX50R nvu, 5-Axis Universal Machining Center MX 10 and Multitasking Machining Center MTX 300 for Aerospace and Energy sector will also be on display.

Stamp IT Robotai & Solutions Pvt Ltd

Hall: 11, Booth: F19

The company will be launching a new product “Mobimark”, a cord-



“India has, and will remain, the global laboratory to test ideas, innovation, and experiences. With manufacturing as its focal point, all these aspects will take center stage.”

Ravi Prem
Chief Operating Officer
Forbes and Company Limited

less hand-held marker completely innovated in India, the only machine with a Wi-Fi hotspot operated with a smartphone app used for industrial marking. This machine is suitable to create permanent, clearly visible deep alphanumeric marking on metal components.

UCAM Pvt Ltd

Hall: 12, Booth: E15

UCAM is exhibiting new 5-axis solutions. One particular unit is a direct drive tilting table 450mm in diameter, and is powerful and compact. This product would be of interest to both international and domestic customers. The company has orders for this product from its European customers. Its division Nimble Machines is showcasing motors for 5-axis turning, milling applications.

Gearing up for advanced trends

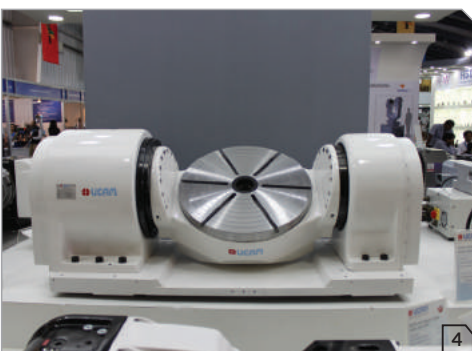
Along with the focus on the traditional machine tools at the show, which are not going to be pensioned off soon, there is a special focus on the



“Indian machine tool building has moved from standalone machine to integrated automation line. We can offer best market option with important requirements for intelligent production system.”

Vijay Zala
Executive Head, R&D
Jyoti CNC Automation Ltd

emerging trends such as additive manufacturing (AM) for which the world is getting ready for. At present, AM in India is up to building prototype in selective sectors and with the developing efforts towards cost viability and productivity aspects, it would expand in many corners in near future. But as rightly put by Vijay Zala, Executive Head, R&D, Jyoti CNC Automation, to keep pace with the developed economies, the Indian machine tool industry must think out of the box, prioritize upskilling and reskilling of the work force and emphasize considerable investment in R&D. A parallel segment must be structured to develop core technologies rather than the ongoing machine tool manufacturing as integration and adoption of AM is easy but development is more challenging. However, being part of the mega machine tool show, in proximity to trends that rule the world of manufacturing will provide Indian players enough tools to come back home and fill the gaps.



Source: UCAM Pvt Ltd

4

CUSTOMER IS THE PRIORITY

Like most success sagas, Yamazaki Mazak India too had a humble beginning. It has risen in stature by staying keenly attentive to its customers' needs and catering to them in due time. More on the company and its philosophy that has taken it places...

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A leading player in the manufacture of advanced technology solutions including multi-tasking, 5-axis, milling, turning, CNC controls and automation, Yamazaki Mazak India Ltd has an interesting growth story to share. From just a small team in Chinchwad, Pune in 1998 that was formed to offer after-sales support, the company grew exponentially in terms of sales, service and application network all over India.

In 2011, the company moved to its new Technology Center in Sanawadi, Pune sprawled over a luxurious five-acre area, which today has the most advanced machines installed for live demonstration and training purposes. Its other five technical centers are in Delhi, Ahmedabad, Bangalore, Chennai and Coimbatore. The facility also houses Online Support System, state-of-the-art Spindle Repair Facility and National Parts Center that maintains an inventory of approximately ₹20 crore worth of spare

parts for the machines supplied in India and UAE. Its Spindle repair and assembly set up is a replica of its Japan facility with temperature controlled environment and Spindle Clean room with dust level as low as (10,000 ppm). The Spindle repaired in this facility gives the same accuracy as of new machines.

Today its customer list includes Mahindra & Mahindra, Ashok Leyland, Jaya Hind, Sundaram Fasteners, Ramkrishna Forgings, Sandvik, and Atlas Copco.

Market potential

The market scene is quite optimistic for the company with demands from commercial vehicles, aerospace, and medical sectors. "Aerospace is a booming market in India. Since worldwide we have a very good footprint in aerospace industries, those references as well as of our service and application support in India are fetching us good enquiries and orders," said Anil Bhardwaj, Managing Director, Yamazaki Mazak

India Pvt Ltd.

For medical implants, the company has a strong customer base in Rajkot, Vapi and Vadodara, Gujarat with the requirement of multitasking machines.

Mazak has intensively worked on developing multitasking machines and has introduced 'Done in One' concept wherein multiple operations like turning, milling, drilling, tapping, cam cutting, deep hole boring can be combined on one machine that can process an entire workpiece, from raw material input to final machining, in a single setup. The company's Integrex and Variaxis models are the most popular and widely accepted machines in the industry.

"For small entrepreneurs and SMEs, the dual challenge is to get good quality machines as well as manpower. To overcome this challenge we manufacture and supply the machines with customized first-level automation from our Singapore facility," he added.

Customization is the key

In line with its philosophy of staying well connected to its customers to gauge their needs, Mazak India offers total turnkey solutions including advanced machines from Japan, and fixtures, tooling, process engineering from India.

"Today customers want the latest in technology to overcome dependency on skilled manpower. With a 'Turnkey Team' of dedicated and highly skilled engineers we understand customer

Yamazaki Mazak
India Ltd's Technology
Center in
Sanawadi, Pune
sprawled over
a luxurious
five-acre area.



Source: Magic Wand Media Inc



“Our latest Mazatrol Smooth controller with most advance features like Conversational Programming, Temperature Control, Vibration Control, Voice Advisor, Dynamic Balancing helps to create cutting program with minimum skill and ease.”

Anil Bhardwaj
Managing Director
Yamazaki Mazak India Pvt Ltd

requirements and provide customized solutions in India,” stated Bhardwaj.

According to Hiromasa Ohtake, Deputy Managing Director, Yamazaki Mazak India, around 65 percent of the business comes from providing customized solutions and 35 percent from stand-alone machines.

Support just a click away

Mazak India is the only imported machine tool builder to have online services to resolve its customers’ issues. In this context Bharadwaj shared, “Sensing the pulse of market we have focused more on customer support functions such as Online Application and Service Support. We are just a phone call away for shop floor as well as management team of our customers.” Adding to this, Pramod Kore, General Manager, Customer Support, Yamazaki Mazak India, stated, “Our total support program combines many standard-setting programs that we have developed over years of working as a strategic partner to manufacturers.”



“In EMO Hannover show we will be displaying 22 advance machines including models specially developed with additive manufacturing and machining capability which will be one step ahead of competition.”

Hiromasa Ohtake
Deputy Managing Director
Yamazaki Mazak India Pvt Ltd

The company focuses on its customer support functions such as Single-Source Support through dedicated toll-free number and email; Technical Support for the Machine & CNC Control; Factory trained team of experienced field service engineers at 15 different locations across India for quick support; Spindle and Unit Rebuild; Parts Support and Machine maintenance and operation training; and Automation and engineering support to ensure the customer is able to maximize the value of their



“Our training program gives the power to achieve more productivity and profitability from Mazak equipment, as well as to stay abreast of the latest manufacturing technology trends.”

Pramod Kore
General Manager-Customer Support
Yamazaki Mazak India Pvt Ltd

Mazak purchase, gain the best possible competitive advantage as well as keep the Mazak equipment running smoothly at all times.

Further to facilitate its customers on new machining trends, said Ohtake, “Mazak has invested heavily on R&D to gear itself up for the current industry trends of Industry 4.0, IIoT, and additive manufacturing that are slated to influence the machine tool sector as well as upgraded its existing products accordingly.”



(L-R) Anil Bhardwaj, Managing Director, Yamazaki Mazak India with company Deputy Managing Director, Hiromasa Ohtake at the showroom in Mazak's Pune facility.

Yamazaki Mazak Corporation
EMO Hannover
18-23.9.2017
Hall 27 Stand B56

ROUGH BORING TOOL CUTS CHALLENGING MATERIAL

By resorting to the recommended Sandvik Coromant's DuoBore 821D rough boring tool approach in the cutting of Nitronic 40 for aerospace work, Excelco/Newbrook Inc. effectively increased feed rates and saved shop production time.

In high-stakes aerospace applications in which a nearly complete workpiece is worth more than a decent-sized home in virtually any suburb, tooling can be critical to a shop's success. Excelco/Newbrook Inc. (ENI) was at a crucial juncture, having tried every boring solution it could think of, when it called in cutting tool supplier Sandvik Coromant. Using the company's rough boring tool, ENI says it

was able to double its feed rate and finish the part 90 percent quicker than it could with its original process.

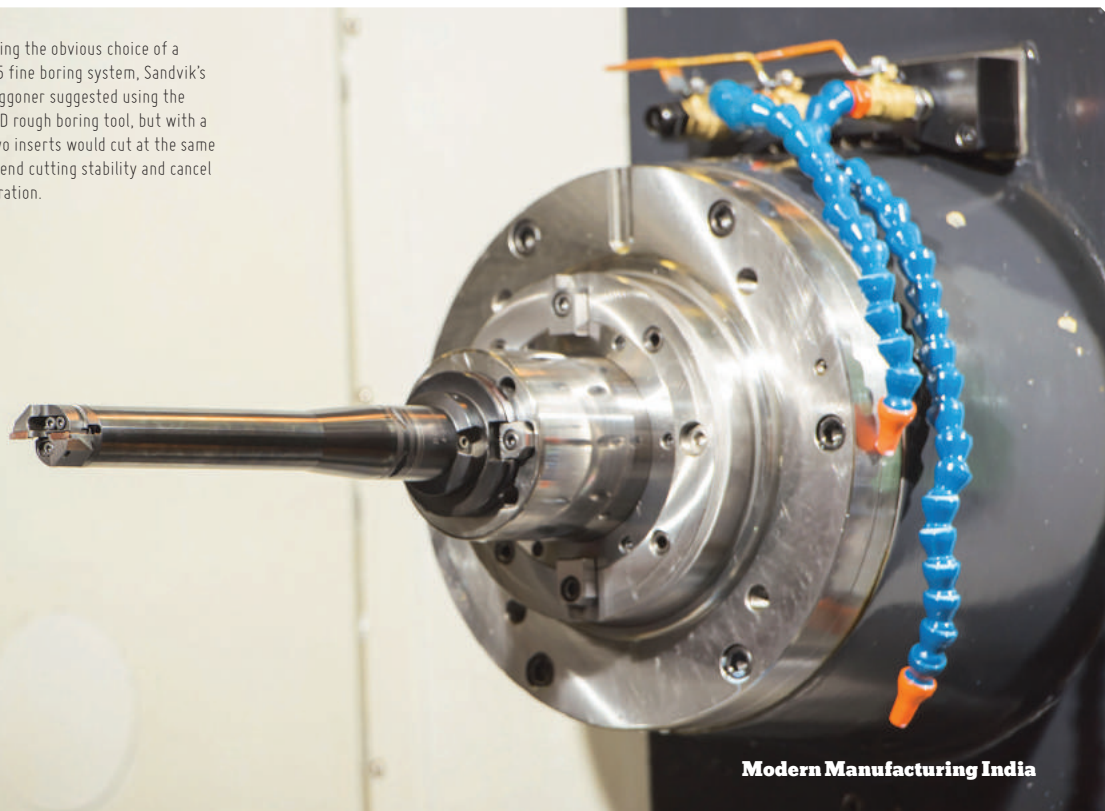
ENI's specialization

In business since 1947, ENI fabricates complex aerospace and defense equipment for clients such as Lockheed Martin, Boeing, Northrop Grumman and General Dynamics. It specializes in Titanium, Inconel, Hastelloy and other metals equally

difficult to machine. Much of this equipment is deployed in such critical-use applications as nuclear propulsion systems, undersea systems, and deep-space equipment, and all are made to demanding requirements.

At first glance, the shop floor might appear fairly typical, even though most of its equipment is large: a handful of boring mills, one of which is big enough to machine a semitrailer; lathes

Instead of using the obvious choice of a CoroBore 825 fine boring system, Sandvik's Christian Waggoner suggested using the DuoBore 821D rough boring tool, but with a twist—the two inserts would cut at the same diameter to lend cutting stability and cancel potential vibration.



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Source: Modern Machine Shop

capable of turning shafts 6 ft. in diameter and nearly three times that in length; a flying-bridge waterjet; an assortment of high-tech welding equipment; and a number of super-sized CMMs and 3D gaging arms to measure the shop's output.

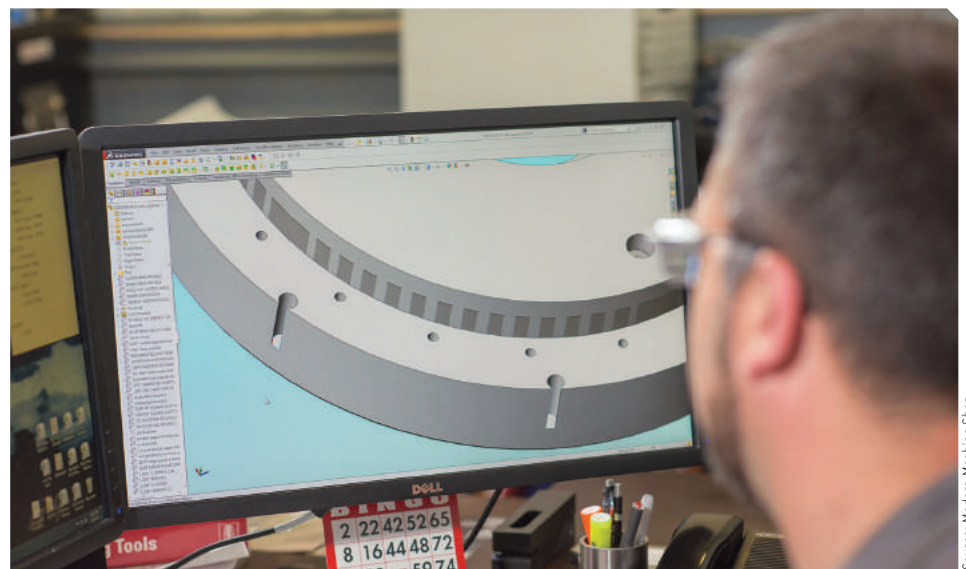
Machining Nitronic 40

Despite these capabilities, ENI recently ran up against a job that tested the shop's machining mettle — a large, precision closure head in excess of 70 in. in diameter and 18 in. thick made of Nitronic 40, a very challenging material to machine. The high-strength, corrosion-resistant stainless steel is typically used in chemical processing, nuclear-containment systems and a variety of aircraft engine components. According to the American Steel and Iron Institute (AISI), this stubborn superalloy carries a machinability rating of 22 — comparable to Waspaloy or Nickel 600, is far tougher than most 300-series stainless steels. According to ENI, it requires a heavy feed and rigid tooling, and it will work-harden if you give it half a chance. In short, Nitronic 40 is a real bear to cut.

Production challenges

Operating a Doosan Infracore DBC 130 horizontal boring machine, machinists Dale Penkaty and Troy Dorman spent weeks working across two shifts to get the closure-head parts completed. One operation in particular posed a significant production challenge: boring a series of 50 flat-bottom holes measuring 1.9 in. in diameter by 6 in. deep, situated around the periphery of the workpiece—like holes drilled in the face of a giant soup can.

Each of the holes breaks into a matching slot milled through the part's outer diameter,



Source: Modern Machine Shop

forming an outward-facing-C shape that makes for a severely interrupted cut. Worse, the hole tolerance is $+0.002/-0.000$ in. on the diameter, with true position accuracy within 0.010 in. It was enough to keep any seasoned machinist awake at night, Penkaty and Dorman say, and they were no exception. "You're not working with much tolerance, and with that kind of material, there's no room for a mistake."

The operation took 80 hours per part. Each hole was roughed out with a spade drill, followed by a modified drill to flatten the bottom of the hole and successive passes with a boring bar prior to milling the slot. "Because of the hole depth, we had a lot of problems with taper," says programmer Dan Kreamer. "Also, there's a boss at the top of the hole we have to work around, so the boring tool sticks out around 11 in. from the spindle face. Everything works against us on this part."

Once the slot was milled, a final boring pass was needed to bring the hole to its final diameter. Boring can be a challenge under the best machining conditions,

especially with blind holes. The chips tend to pile up in front of the tool, and hitting the bottom of the hole can spell disaster. The closure head took boring to a new level of difficulty—between the interrupted cuts and the Nitronic's poor machinability, ENI's machinists were forced to index the finishing insert after every hole. This meant they had

The most difficult operation was drilling 50 flat-bottom holes measuring 1.9 in. in diameter by 6 in. deep, situated around the periphery of the workpiece. Each of these holes breaks into a matching slot milled through the part's OD, forming an outward-facing-C shape.



Source: Modern Machine Shop

The boring tool sticks out around 11 in. from the spindle face, so reducing vibration during the boring process was critical.



Source: Modern Machine Shop

Machinists Dale Penkaty and Troy Dorman operate the Doosan Infracore DBC 130 horizontal boring machine where the closure head was machined. With Sandvik's tooling, the men could complete a part in a single shift, a 90 percent time savings compared to the previous process.

to back off the boring head, take a test cut, measure and adjust until the correct diameter was achieved.

For a better boring solution

At this point in the machining process, the workpiece was nearly complete, but with the production backlog mounting behind this stalled job, ENI's production crew knew they had to find a better boring solution. They tried different carbide grades and insert geometries, a range of feeds and speeds, larger and smaller nose radii, but nothing worked.

Kreamer suggested they give Sandvik Coromant a call. The team had worked with Sandvik's Christian Waggoner in the past and, based on his recommendations, were having good luck on a similar, yet smaller, application.

Waggoner visited the facility, observed the machining operation and spoke with the machinists. Considering the part tolerance, conventional

logic said he should recommend a CoroBore 825 fine-boring system. With the ability to adjust boring diameter in increments of 0.002 mm (0.00008 in.), a cartridge-style insert and a system size range to handle most anything ENI could throw at it, the 825 should have been the tool of choice, and would have surely provided the accuracy and repeatability needed to complete the holes in a reasonable amount of time.

The DuoBore 821D approach

But that's not what he did. The problem, he explains, is the interrupted cut. With the 825's single insert, every rotation of the spindle takes the insert in and out of the cut, creating harmonics and tool vibration sure to destroy even the best of carbides. Given the interrupted nature of the cut, and considering the need to bore 50 holes per workpiece, Waggoner decided to take a different approach and

recommend the DuoBore 821D rough boring tool.

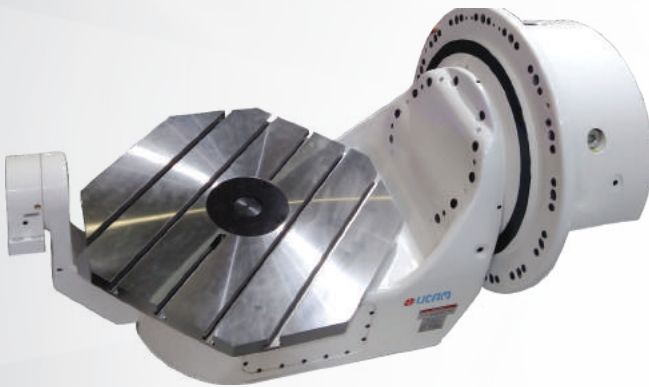
Designed as a roughing tool, the 821D carries two cutting inserts, each 180 degrees apart. Under normal use, one of those inserts is set to a slightly smaller diameter than the other and shimmed to sit a few thousands ahead, thus creating a step-boring effect at twice the feed rate of a single-edge boring tool. Waggoner knew that if he could set the two inserts to cut at the same diameter, each would lend stability to the other when it swung out of the cut, thus canceling any potential vibration. Also, because the 821D utilizes Sandvik Coromant's Silent Tool boring-bar shank, the harmonics generated by the interrupted cut and extended-reach application would be canceled.

Favorable results

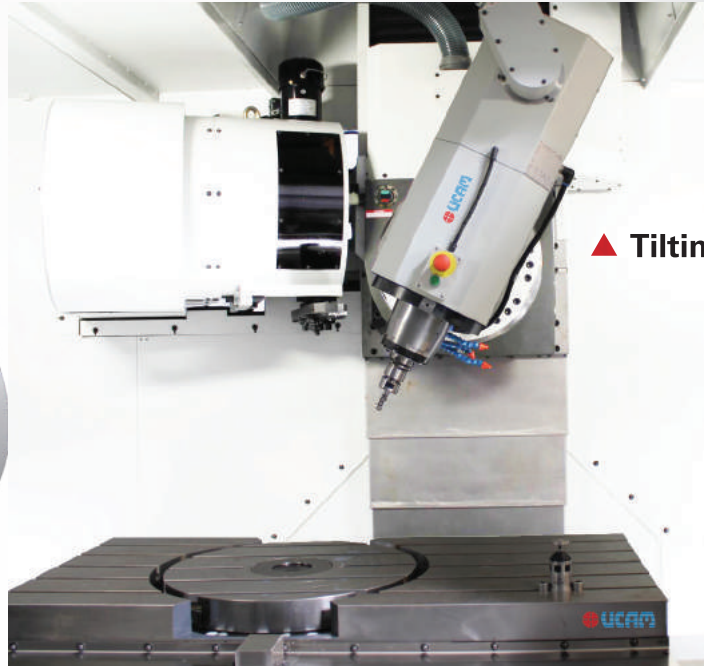
He says it took some finagling, but Waggoner worked with ENI's machinists to set up a test fixture and map out a process to set the tool. With fingers crossed, the team took the first cut. The results were astounding, Kreamer says. "You have to be careful when you set the tool, because the cut needs to be perfectly balanced. Even so, we finished the first part in a single shift, a 90-percent time savings over the previous process," he says. In addition, they no longer have to index the insert after every hole. Instead of 50 insert tips per part, ENI now uses five to six, with minimal test cutting. "The tool is exactly where we expect it to be, every time," Kreamer says. The collaborative problem-solving of both the production team and Waggoner helped the company create a sound machining process, reducing the shop's backlog by nearly one month. 

High performance. High efficiency.

Solutions for Machine Tool Builders



▲ Cantilever Table



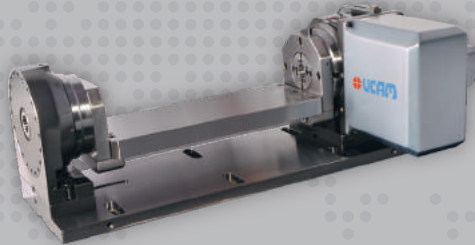
▲ Tilting Head

▲ Table in Table

World of 4th & 5th Axis Solutions



▲ CNC Rotary Tables



▲ Rotary Production System



▲ Tilting Rotary Table



Source: SKF Evolution

Collaborating with its global counterparts will help Indian industry gain access to critical technology needed to build armed forces.

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SOARING HIGH

Opportunities are brimming in India's emerging aerospace and defence sectors, leading to large scale tie ups between Indian and foreign companies. Certain initiatives like IMTMA's AeroDef project have surfaced to help Indian machine tool builders better equip themselves to cater to the precise demands of the sectors and fill the gaps.

India's machine tool industry has its gaze fixed firmly upon Aerospace and Defence sectors, recognizing them as new sunshine markets. The country's developing infrastructure and the government's attempts at providing impetus to 'Make in India' through its investor-friendly policies such as Defence procurement policy and Strategic partner policy, present an attractive and significant opportunity for the foreign firms to forge alliances with the local players to make equipment for the two sectors.

Making full use of this opportunity, OEMs and their suppliers are leveraging India's competitive advantages in manufacturing by setting up units in India. Bharat Forge, Reliance Industries, the Tata group, Ashok Leyland, Larsen & Toubro, the Godrej Group and the Mahindra Group are some examples that have entered into such strategic partnerships, with the latest being the Adani Group.

"In continuation of our vision of nation building, we are keen to play an instrumental role in helping transform India into a destination for world class high-tech defence manufacturing," says Gautam Adani, Chairman, Adani Group over its tie-up with Sweden's Saab to bid for defence deals in India, with a focus on manufacturing Gripen fighter jets in the country.

Global players important for Indian firms

The Indian industry with all its capabilities is still at a stage of evolution. Collaborating with its global counterparts will help it gain access to critical technology needed to build armed forces.

According to Dr Wilfried Schaefer, Executive Director, German Machine Tool Builders' Associa-



"An estimated \$100 billion contracts are likely to be signed in the next decade to modernize India's armed forces, providing opportunities for Indian and foreign firms to forge alliances for mutual benefit."

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

tion, VDW, European machine tool manufacturers, especially German ones, are in a very good shape for supplying to the aerospace sector. "Since progressively more components in an aircraft are being manufactured with the aid of industrial-scale 3D printing, companies here have excellent opportunities to score highly on the up-and-coming Indian aerospace market," he adds.

This is because in regard to additive manufacturing processes for metal components, especially, German manufacturers are playing a front-runner role. These processes enable lighter and more stable structural components to be produced.

Challenges encountered

With all the developments happening, there is still a lot of room for the Indian machine tool industry to optimally cater to the precise requirements of aerospace and defence sectors. Shailesh Sheth, Past President & Mentor, IMTMA lists several constraints to entering into the space.



"In continuation of our vision of nation building, we are keen to play an instrumental role in helping transform India into a destination for world class high-tech defence manufacturing."

**Gautam Adani
Chairman, Adani Group**

"Manufacturing aerospace components is not everyone's cup of tea. It is recognized that metalworking machine tools and manufacturing technologies required by aerospace sector are specialized – large in size, requiring very different approach in the entire process of 'design to delivery'. These include a unique set of knowledge, skills, precision, technology-intensive focus," he says.

However, Vikram Salunke, Managing Director, Accurate Gauging & Instruments Pvt Ltd, strongly feels that there is a lack of awareness of local machine tooling capabilities of India among most global companies involved in aerospace. "Hence, most recommendations of RFQ, therefore, refer to few international brands, which becomes a show stopper for an Indian company to get an equal opportunity during the bidding process."

Another challenge is the sector's demand for specialized materials, accuracy and quality check process. "In order to fulfill these, local machine tool manufacturers need to develop non-con-



"Metalworking machine tools and manufacturing technologies used in aerospace sector require a unique set of knowledge, skills, precision, and technology-intensive focus."

**Shailesh Sheth
Past President & Mentor, IMTMA**

ventional processes and technologies," opines Milind Kelkar, Chairman, Grind Master Group. Understanding the economics of investment by the buyers in aerospace industry is yet another essential feels Vivek Nigam, Executive Vice-President & Head of Business Unit - Machine Building, Isgec Heavy Engineering Ltd. "Investments are made for long term and low price is mostly not a criterion."

"There is a need to focus on the consistency in the precision class of machines, in order to be a global player in this sector. The challenge is to develop machines which perform consistently in-spite of thermal variations due to the heat generated in the machines, especially the ones used in tropical regions. We are working towards providing these solutions. The Indian machine tool industry also needs to look at building larger machines for structural parts of aircrafts. This segment is at present addressed only by overseas manufacturers," explains Soundhar Rajhan, President, Machine Tool Division, LMW.

India's spending in the next five years is expected to be \$25 billion for commercial and \$100 billion for defence aircrafts.



"Since progressively more aircraft components are being manufactured with the aid of industrial-scale 3D printing, German companies have excellent opportunities to score highly on the up-and-coming Indian aerospace market."

Dr Wilfried Schaefer
Executive Director, German Machine Tool Builders' Association, VDW



"Machine tools built in India are far more robust and have significant advantages on the after sales and future upgrade capabilities. Indian companies need to increase their brand awareness at decision making level with global customers."

Vikram Salunke, Managing Director,
Accurate Gauging & Instruments Pvt Ltd



"We are well ahead with our advanced 5-axis solutions and already supply them to international OEM customers. We await challenges of supplying them high-performance units for building their machines for aerodef applications."

Indradev Babu, Managing Director,
UCAM Pvt Ltd

AeroDef can create a platform in India for knowledge sharing on the technical requirements such as materials, methods and machinability.

Industry gearing up

Despite various odds, the machine tool manufacturers of the country such as Jyoti CNC Automation are relentlessly trying harder to make the most of the present opportunities in the aerospace and defence sector with their innovations. The result of which is a host of awe inducing names in its client list including BrahMos Aerospace; ISRO (SAC - Space Application Centre, VSSC- Vikram Sarabhai Space Centre); Tata Sikorsky Aerospace Ltd, Tata Advanced Systems Ltd; Huron; Heavy Alloy Penetrator Project; Airbus; Boeing; Bombardier; European Aeronautic Defence and Space Company and Sukhoi.

The company's offerings for the sector include: KX FIVE Series, HSM concept that enables operations in 5-axis simultaneous from roughing to finishing of a variety of complex high precision applications, especially designed for complex aerospace components and high integrity mechanical parts manufacturing.

UCAM is well ahead with its bas-

ket of advanced 5-axis solutions and is already supplying these to international OEM customers for aerospace parts machining. Grind Master too has strategic alliances with MJC, USA for its Flow Forming technology; ACT Robotics, USA for Robotic Grinding & Finishing of Turbine Blade; and Timesavers, Holland for Robotic Grinding & Finishing of Turbine Blade. "These partners are well-established and regularly supply their technology to Aerodef sectors," informs Kelkar.

Project AeroDef

The project came into being when the need to aid local machine tool players overcome hurdles in catering to aerospace and defence sectors and curtailing imports was strongly felt by the Indian Machine Tool Manufacturers' Association (IMTMA). Hence, the name AeroDef.

"Around 65-70 percent of India's defence requirement is imported from global aerospace and defence companies, making it world's eighth largest purchaser of defence armament and equipment. India's spending

in next five years is expected to be \$25 billion for commercial and \$100 billion for defence aircrafts. Assuming an offset of 30 percent, total offset opportunity for aerospace sector alone is valued at minimum \$10-15 billion of manufactured parts, if not more," points out Sheth. As a first step, on Baba Kalyani's suggestion, IMTMA organized



"The machine tool manufacturers need to understand the demands of special materials, accuracy levels, and quality check process of the aerospace sector, and develop non-conventional processes to fulfill them."

Milind Kelkar, Chairman,
Grind Master Group

technology missions to various institutions in the UK, Germany and Spain.

Through the project, IMTMA aims, with some encouragement and support, to groom the Indian machine tool players to quickly graduate to meet these specialized requirements. The process is to first select companies on the basis of their capabilities. An agency is then hired to help them through documentation, get them trained for the certifications required, and put their internal systems in proper order.

The key projects objectives are to:

Expose and familiarize select industry CEOs to advance and high technology developments at leading global aerospace institutions; Meet and interact with manufacturers of aerospace raw materials, components, and machines for the aerospace and component industries; Understand the type and nature of metalworking machine tools and manufacturing technologies required for aerospace and defence manufacturing, to enable indigenous development and manufacture in India; and Explore possible alliances with machine manufacturers, so as to jointly exploit market opportunities in the Indian aerospace and defence industries.

Industry expectations from AeroDef

According to Soundhar Rajhan, "AeroDef can create a platform in India for knowledge sharing on the technical requirements such as materials, methods and machinability. This will help the Indian suppliers respond faster to the requirements of the Aerospace OEMs, rather than each company spending enormous time and money to arrive at results, which have already



"Today, we have many players like us supplying parts to major OEMs. There is a vast resource and capability in our country, which is largely under-utilized in terms of knowledge on some critical parameters and materials."

**Soundhar Rajhan, President,
Machine Tool Division, LMW Ltd**

been established by the Aerospace OEMs.

"Machine tool and tooling companies can offer their products and services to cater to global requirements helping several defence players fulfil their off-set obligations. The new defence procurement policy has provided certain measures in this direction. An effective awareness of



"The AeroDef Project can contribute in bringing openness among public and private sector buyers for indigenous development. Forums of equipment users and selectors make ideal platforms to make them aware of high reliability of Indian machine tools."

**Vivek Nigam, Executive Vice-President &
Head of Business Unit-Machine Building,
Isgec Heavy Engineering Ltd**



"The 'Make in India' initiative launched by Prime Minister Narendra Modi, as part of a wider set of nation-building initiatives, has paved way for India machine tool manufacturers to cater to the requirements of aerospace and defence sectors."

**Dr Arvind Patel, Managing Director,
Sahajanand Laser Technology Ltd**

this is required to be generated among the customers as well as various trade promotion bodies of like CII, FICCI, ASSOCHAM," says Salunke.

For Nigam, AeroDef Project can substantially contribute in amplifying influence of 'Make-in-India' pitch, particularly in Government controlled investments. As a group, it can highlight opportunities offered by Defence sector to its members. It can contribute in bringing an open mindset among public and private sector buyers for indigenous development. Organizing meet ups at different forums of equipment users and selectors can make them aware of high reliability and productivity of Indian machine tools. 

*To know about IMTMA's
initiative on the Aerodef Project
please write to us at
soumi.mitra@magicwandmedia.in*

*We will be glad to connect
you with the concerned team
members from the Association.*



Source: Hypertherm

Improvements in hole and slot cut quality were observed in the part cut with genuine Cu+ consumables.

RAISING PRODUCTIVITY WITH RIGHT CUTTING CONSUMABLES

To reduce costs, manufacturers, at times, resort to cheaper alternatives from unauthorized suppliers, which, rather than being profitable as expected, turn out to be fake and counterproductive. An account of Bharat Foils Ltd's inadvertent use of counterfeits of Hypertherm that impacted its manufacturing process and how genuine cutting consumables helped it attain its productivity goals.

SANJAY KUMAR
Consumable Sales Manager
Hypertherm India
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hypertherm.com



Currently where competition is rife, productivity and cost-effectiveness are often key differentiators that allow companies in the manufacturing sector to stand out amongst their business rivals. Over the years, manufacturing processes have progressed

steadily with the advent of technology, and one of the key aspects of production lies in the machinery, where metalworking plays an important role.

Plasma system and its consumables

For many equipment manufac-

turers, sheet metal cutting is a common procedure in their factory. India-based Bharat Foils Ltd is one such company. Established in 1975, the family-owned business has a long history in equipment manufacturing, and currently specializes in the production



“With Hypertherm’s consumables, our consumption level has gone down by 40 percent while the quality of our cutting has improved greatly. We are growing rapidly because our productivity has increased, and are able to offer a high-quality product that is on par with our competitors.”

**Sunil Gupta, Managing Director,
Bharat Foils Ltd**

of equipment used in the grain milling industry, spanning the entire process from cleaning to drying, milling processing, and packing. In its daily operations, plasma cutting systems play a pivotal role as the company cuts 10 to 12 tonnes of sheet metal per day on average.

Modern cutting technologies, such as plasma systems, can produce high quality cut parts at fast speeds, requiring little or no post-production processes. That said, the performance of a plasma system is also dependent on the consumable parts used with the torch. Even the latest advances in technology and torch designs are not exempted from this ‘rule’ – a high performance plasma system can be rendered mediocre when inferior consumables are used.

Means to reduce costs

Often, instead of purchasing consumables directly from the cutting system provider or authorized retailers, manufacturers may seek out cheaper alternatives from other suppliers to reduce operating costs. This can lead to increased risks of purchasing counterfeit products unknowingly, since counterfeits are usually close copies of the genuine product that look similar in appearances, but are sold at relatively lower prices.

Despite being functional and cheaper, the usage of counterfeit consumables can be more counterproductive than bene-

A high-performance plasma system can be rendered mediocre when inferior consumables are used.

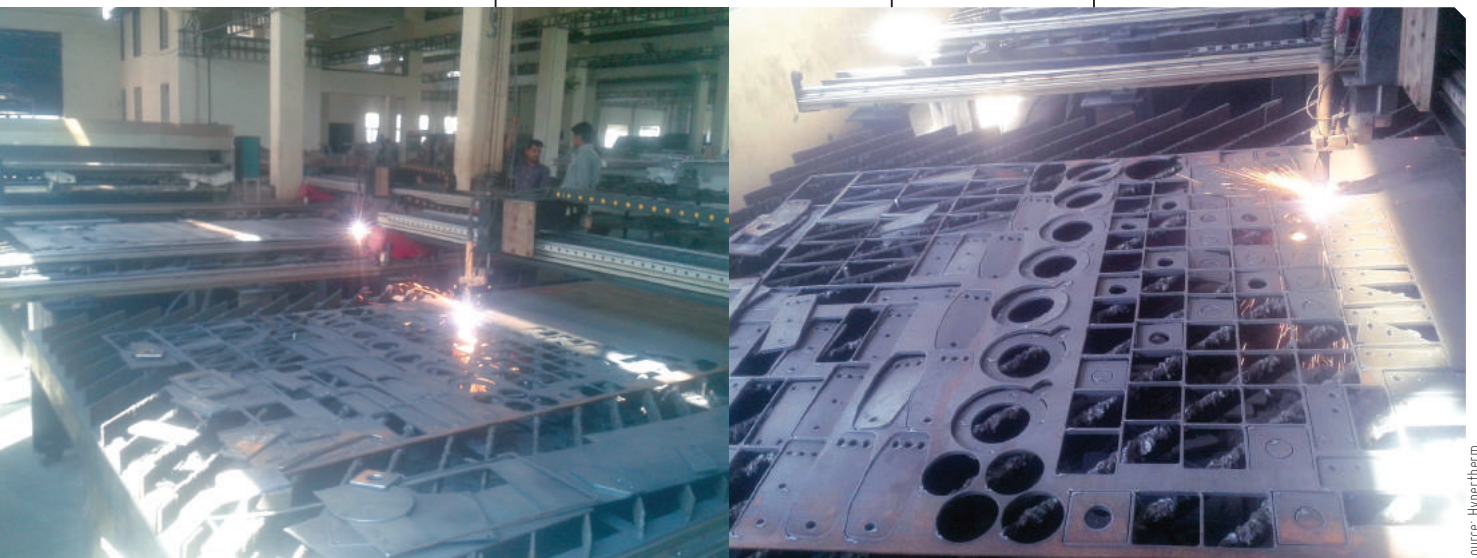
ficial, as experienced first-hand by Bharat Foils.

Counterfeits uncovered

A customer of Hypertherm for several years, Bharat Foils currently uses six Powermax85 plasma systems in its factory. As part of its service standards, Hypertherm routinely checks in with customers even after a purchase has been made. It was during one such occasion that a channel partner discovered that Bharat Foils had been purchasing consumables from another source in the open market. They had noticed from their records that the company had not been purchasing consumables from them despite owning six plasma systems.

The matter soon came to Hypertherm’s attention and after further investigations, it was revealed that unbeknownst to Bharat Foils, the consumables they had purchased were, in fact, counterfeit products, as they looked virtually identical to the genuine consumables. Sunil Gupta, Managing Director, Bharat Foils Ltd, shared, “Our purchase department was instructed to source from the open market, to see if we could

Photographs taken during the trial.



Source: Hypertherm

HIGHLIGHTS

TRIAL RESULTS WITH GENUINE VS. COUNTERFEIT CONSUMABLES

- ▶ For the same amount of mild steel plates cutting, Bharat Foils had to use three sets of counterfeit consumables compared to just one set of genuine consumables.
- ▶ A significant increase in cutting speed was observed (around 68 percent on average) with the use of the genuine consumables.
- ▶ During the trial, counterfeit consumables had inconsistent lifespans, with the first set getting damaged after just 9 meters of cutting.
- ▶ Quality-wise, the machine fitted with genuine consumables also delivered parts with better hole and slot cut quality.

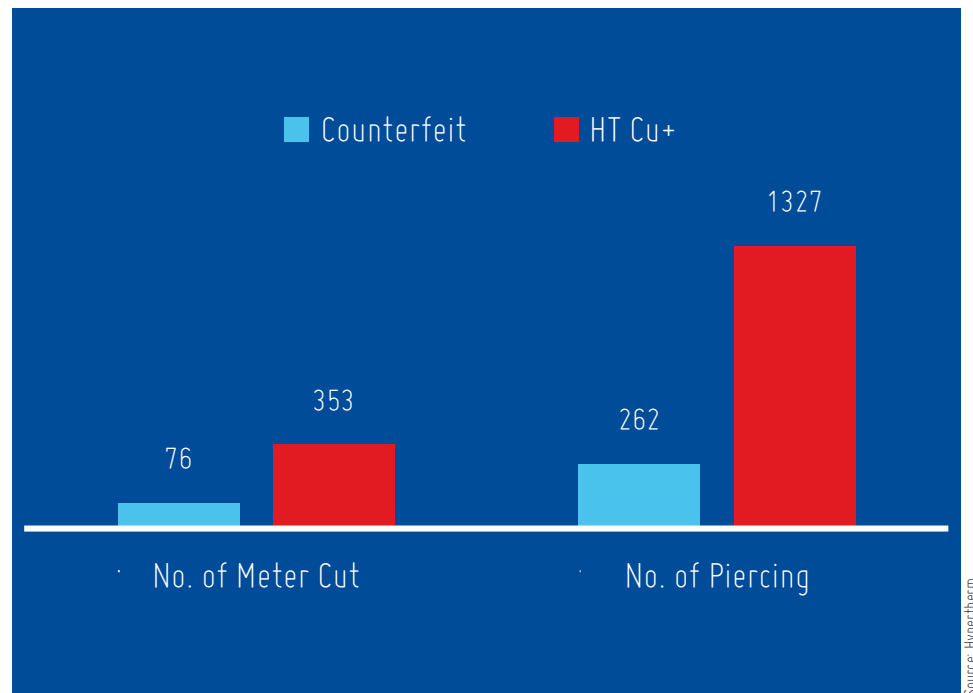
get the consumables at a better price than what was offered by the channel partner. We found a product which looked like Hypertherm's and hence started to purchase from that source." Upon understanding the situation, Hypertherm immediately contacted Bharat Foils to explain the consequences of using counterfeit parts, and the benefits associated with using genuine consumables. During a discussion with the operators at the company, Hypertherm also found out that they had to reduce the cutting speed in order to maintain acceptable cut quality, which resulted in cutting issues like dross that required secondary work. The consumables' performance was also found to be inconsistent and had to be changed frequently.

Trials, tests & results

The high consumable consumption ultimately resulted in higher expenses in cutting operations for the company, in addition to reduced cut quality

and decreased productivity. To illustrate the difference in performance between the genuine and counterfeit consumables, Hypertherm proposed the idea of conducting some trials in the factory.

Two separate trials—one with Hypertherm Cu+ consumables and the other with Bharat Foils' existing consumables—were conducted simultaneously for three days under similar conditions, on mild steel plates of varying thickness (8 mm, 10 mm, and 12 mm). As the trials progressed, the differences in performance became apparent to Gupta. For the same amount of cutting, Bharat Foils had to use three sets of counterfeit consumables compared to just one set of genuine consumables. The team also observed a significant increase in cutting speed (around 68 percent on average) with the use of the genuine consumables. During the trial, it was also noted that the counterfeit consumables had inconsistent lifespans, with the first set getting damaged after



Results of the trial showed that the original consumable performed 3 to 4 times better in terms of cut length and number of pierces.

just 9 meters of cutting.

Quality-wise, the machine fitted with genuine consumables also delivered parts with better hole and slot cut quality. Upon assessing the results, Gupta became convinced of the benefits brought by the use of genuine consumables, and immediately made the decision to switch to Hypertherm's consumables.

Better performance

Since switching to genuine consumables, Bharat Foils has experienced smoother operations, lesser down time, and better customer service levels. These benefits have led to a significant overall improvement in their manufacturing process, notably in the areas of productivity, cost effectiveness, and customer satisfaction.

Moving forward, Gupta intends to adopt other cutting solutions to enhance Bharat Foils' operations, with high definition plasma cutting systems being next on his list.

Source: Hypertherm

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FORGING TIES FOR BIGGER PROSPECTS

In order to develop advanced technologies in India, it is imperative for businesses and academic institutions to join forces. An instance of the fruitful union of the Indian Institute of Technology Madras and Micromatic Grinding Technologies, Ghaziabad & Bengaluru.

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A common complaint that one hears from employers is that “our graduates are not industry-ready.” But this scenario is definitely changing. Recently, the Indian Institute of Technology Madras (IITM) and Micromatic Grinding Technologies (MGT) Ghaziabad jointly developed advanced grinding machine technology. The project was supported by the Office of the Principal Scien-

tific Adviser (PSA) to the Government of India. Starting with the company’s best present product, applying a thorough scientific approach to the subject, IITM has helped the company develop a substantially improved grinding machine with superior accuracy and productivity.

A remarkable aspect of the project, which took around four years for completion, was

the close and continuous interaction between IITM faculty, technical and project staff and scholars with technical staff of the company at every stage of design, manufacturing, assembly, integration and testing. Prof N Ramesh Babu, V Balaraman Institute Chair, Manufacturing Engineering Section, Department of Mechanical Engineering, IITM highlighted, “Tapping the high precision

Dr R Chidambaram,
Principal Scientific
Adviser, Govt. of India,
at the Inauguration at
IITM of NGPG machine
built by MGT, along
with Prof Ramesh
Babu, NK Dhand,
Dr K Subramanian &
PRMC team members.



Source: MGT

machine tool market by indigenous machine tool manufacturers mandates the incorporation of technological advancements, which would enable them to build next generation high precision grinding machine tools." P Mohanram, Senior Advisor - Technology, Indian Machine Tool Manufacturers' Association (IMTMA), added, "The whole program was driven by a Project Review and Monitoring Committee (PRMC) constituted by the Office of the PSA, which had renowned academic and industry members on it. This project also received guidance and mentoring through all phases from Dr K Subramanian of the Science Based Technology, Innovation and Management Solutions (STIMS) Institute, USA - a knowledge integration company."

What can we learn from this?

These are the learnings, not only for MGT but for other industries as well:

Cooperative R&D is entirely possible between industry and academic/R&D institutions in India as long as everyone is focused on the same common goal i.e. advancement of academic knowledge that supports commercially viable end results.

Such an approach is most appropriate for medium to long term R&D projects (3-5 years), not those requiring immediate development.

At higher reaches of technology, the scientific inputs can only be brought by academia, since industry mostly does not have the needed resources.

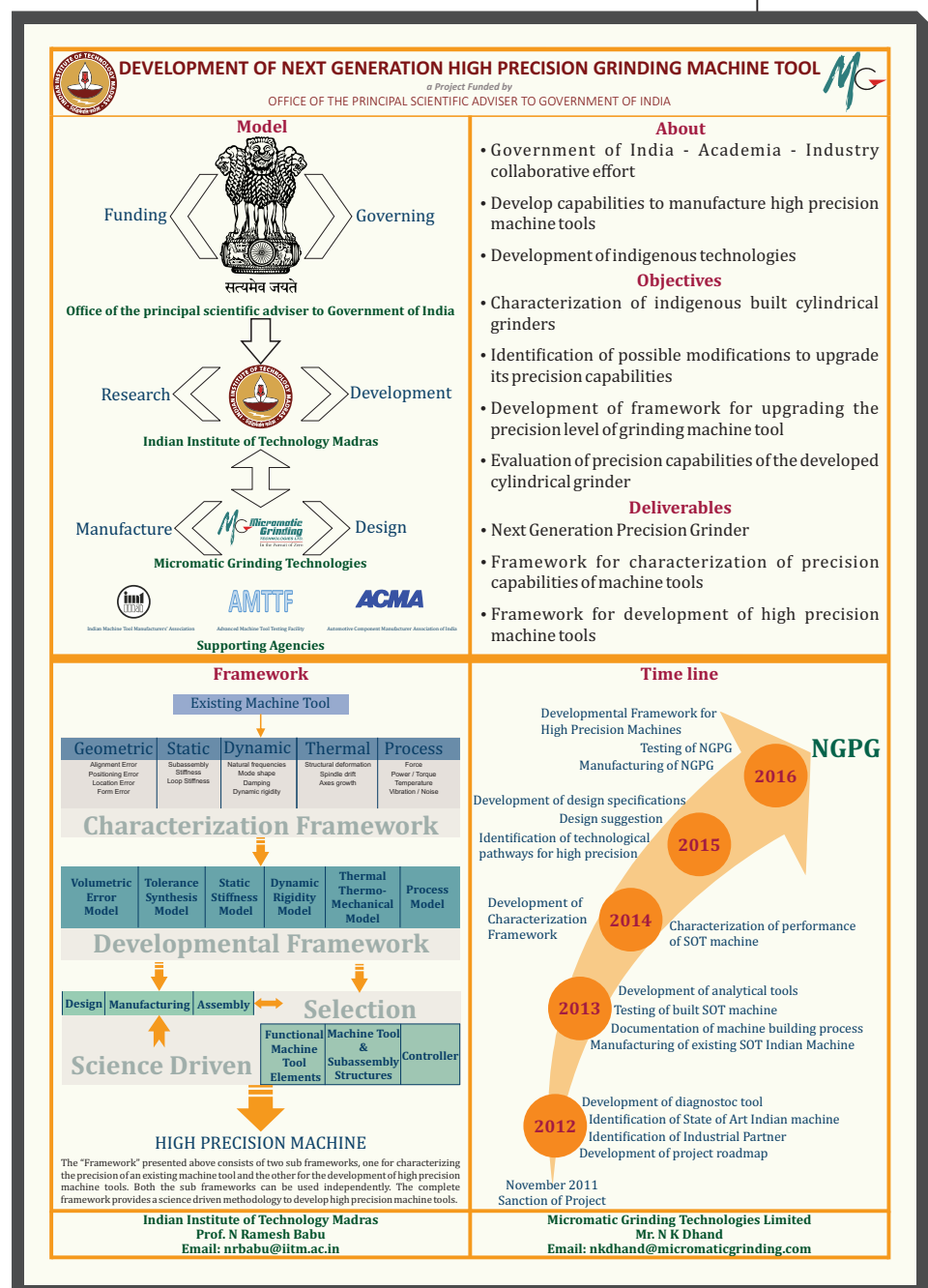
There are tools and resources available from facilities like Advanced Machine Tool Testing Facility (AMTTF) that could be deployed by the students and industry professionals. Developing such ecosystem enhances

efficiency and reduces the total cost and investments needed in such projects.

A structured project with System Thinking leading to clearly laid down quantified objectives stands a good chance of success. There must be a driver each from industry and academia, who make it their personal mission to complete the project successfully.

It is essential for the industry and academic institution to continuously interact and jointly work on the project at every stage. Such collaboration also benefits from engagement of organizations such as IMTMA as well as international experts in Knowledge Integration.

A free exchange of information and data is essential, without being worried about





“Tapping the high precision machine tool market by indigenous machine tool manufacturers mandates the incorporation of technological advancements, which would enable them to build next generation high precision grinding machine tools.”

Prof N Ramesh Babu
V Balaraman Institute Chair,
Manufacturing Engineering Section,
Department of Mechanical
Engineering, Indian Institute of
Technology Madras



“The whole program was driven by a Project Review and Monitoring Committee (PRMC) constituted by the Office of the PSA, which had renowned academic and industry members on it. This project also received guidance and mentoring through all phases from the STIMS Institute, USA – a knowledge integration company.”

P Mohanram
Senior Advisor - Technology,
Indian Machine Tool
Manufacturers' Association

Intellectual Property (IP) confidentiality at every stage. This can be secured through a mutual Non-Disclosure Agreement (NDA) at the start.

If properly reviewed and managed periodically (as by the PRMC), it is possible to complete such projects within the time and budget allotted.

It is heartening to note that the Government of India has supported 11 more such projects now for the development of advanced machine tool technology at IITM with the participation of six machine tool companies. If these projects can be successfully completed and the concerned companies derive market advantage, then it can truly be said that industry-academia cooperative R&D has reached a mature stage. There is in fact no other way to develop advanced technology in India.



Herald the Latest Technology

Unveiling Next Generation Precision Grinders at IIT Madras

Recently, the Next Generation Precision Grinder (NGPG), an indigenous high precision cylindrical grinder, was inaugurated at the IIT Madras (IITM) campus by the Principal Scientific Adviser (PSA) to the Government of India (GoI), Dr R Chidambaram. This Precision Grinder has been built through a joint collaborative effort between industry and academia i.e Micromatic Grinding Technologies (MGT) and IITM, a project funded by PSA's office to GoI. The aim was to indigenously develop the technologies to bring out a best-in-class High Precision Machine such as Cylindrical Grinding Machine Tool in the country.

There is an increasing demand for high precision equipment and components in strategic sectors like automobile, aerospace, defence, nuclear and medical. These sectors typically employ large numbers of imported grinding machines to meet their demands, due to the inability of such high precision machines being manufactured by the Indian machine tool manufacturers. Traditionally, the development of high precision machine tools is treated as something very complex and known only to foreign machine tool manufacturers with specialized skills and advanced technologies. Tapping the high precision machine tool market by indigenous machine tool manufacturers mandates the incorporation of technological advancements, which would enable them to build the next generation high precision machine tools.

In this project, IITM generated the necessary information and knowledge to realize the precision for the grinding machine, from the existing best available from an Indian machine tool manufacturer, prepared a framework to design and analyse the existing grinding machine, and finally developed the methodology for the next generation indigenous high precision CNC cylindrical grinder. Such projects coming to life confirms the fact that “Make in India” dream for the domestic and global markets is coming true.

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PROPELLING TOWARDS EXCELLENCE

An account of out-of-the-box thinking that helped Mahindra and Mahindra's Kandivali Plant overcome a productivity bottleneck, significantly reduce rejections and cost of production. The innovative solution of converting an existing Hot Core box to Cold box process made the company the rightful recipient of the Award this year at the National Productivity Summit.

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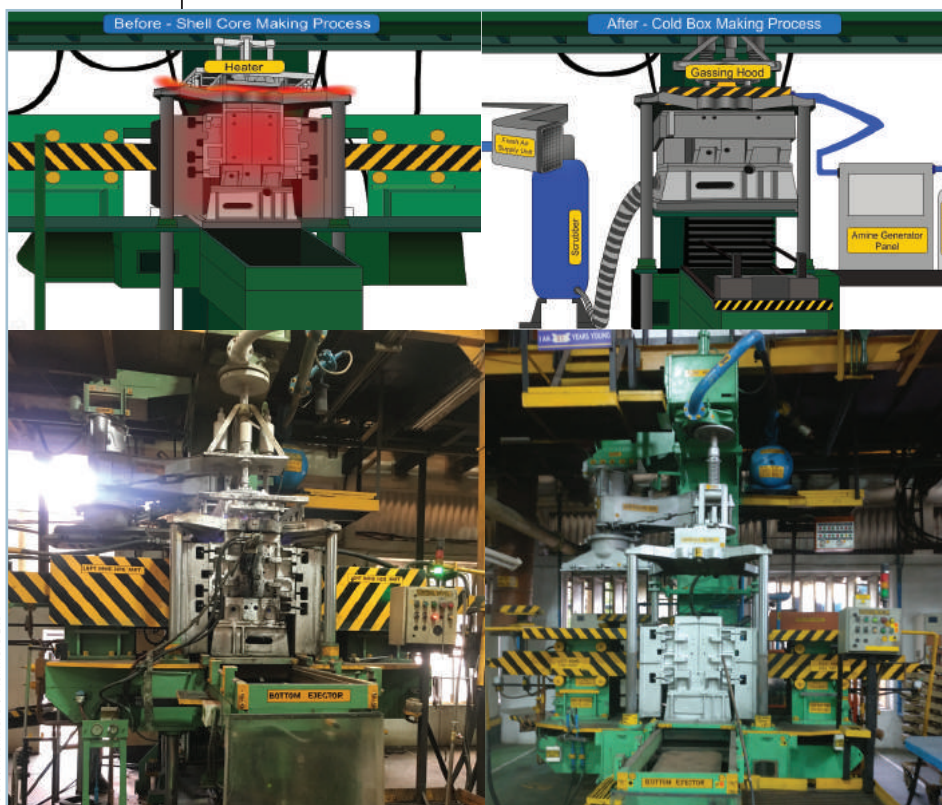
Mahindra Kandivali Plant is the mother plant of Mahindra Auto Sector that operates on the Product Unit Concept. There are six product units producing aggregates and vehicle—Axle, Body, Engine, Foundry, Transmission and Vehicle. Apart from vehicle production, the plant produces and supplies aggregates to the company's other plants like

Nashik, Chakan, Haridwar and Zahirabad, Igatpuri of Auto Division and also to Mahindra Farm Division.

Mahindra foundry

It is a Grey Cast Iron captive foundry, commissioned in the year 1971. It has a built-up area of 2.5 acre and a dispatch capacity of 15,000 metric tons. The company produces DI Cylinder Heads and Crank Case Castings

which are considered to be one of the most difficult castings in the foundry industry. The Cylinder Heads constitute almost 80 percent of its production. The company is a Single Source for these casting products. Its customers are Auto Division, Farm Division, Power-all Gen-sets and Agri business. It also exports castings to Mitsubishi Tractors Japan as well as Mahindra USA.

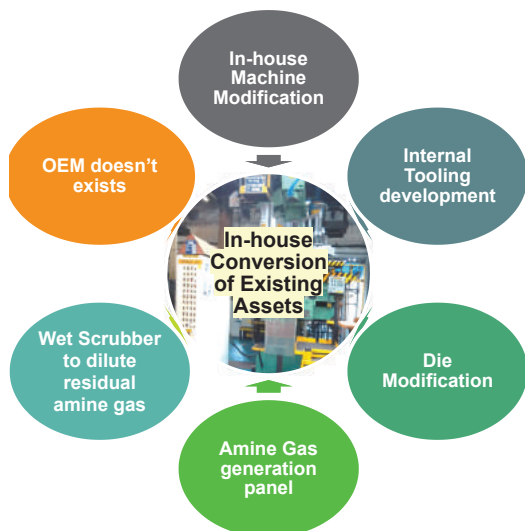


Source: Mahindra & Mahindra Ltd

Benefits at a glance

- ▶ Earlier M&M's core making capacity was constrained to 258 no's/day which was enhanced with cold box project implementation to 353 no's/day. This increased company's capacity by 95 cores/day and created opportunity to generate additional business and move global.
- ▶ M&M grabbed new business for producing parts for Yuvraj which has recently launched under the name of JIVO Tractor.
- ▶ The company created a new platform to export its Cylinder Head CRS to MAM - Mitsubishi.
- ▶ It could save 1.28 crore per annum with raw material cost reduction, PNG consumption reduction and manpower optimization through productivity improvement.
- ▶ New business has created an opportunity to generate additional revenue of ₹17.6 crore per annum.
- ▶ Carbon footprint was reduced by 62 tons per year.

Complexity of Project Execution



Uniqueness of this project :

- ▶ Seamless execution of Project without interrupting running production
- ▶ Flexible Manufacturing with First Time Right Approach calls for patent
- ▶ All 3-P addressed to ensure inclusive growth.

Source: Mahindra & Mahindra Ltd

Planet, People and Profit Problems

Foundry process flow comprises of many processes such as core making, moulding, melting, pouring and fettling, all integrated with each other. After analysing foundry's capacity through Yamazumi, it was found that bottleneck was in the area of core making stage. Teams mapped the entire process for cellwise carbon footprint generation to realize the adverse effect on the planet and found that the core making stage is the second largest contributor of CO₂ generation. Already focused CFT Team is working on the Melting Section which was highest Carbon Footprint Generator.

Associates' fatigue was studied through scientific ergonomic tool 'SSES' (Simplified Safety and Ergonomics Study) and it was realized that there was high fatigue to associate due to the heat involved (300°C) in the Shell Core making stage.

Resolving the problem

M&M carried out a why-why analysis against each phenom-

enon like high cycle time, high CO₂ emission and high fatigue to associates, and found the common root cause of 'Exothermic Process' that needs heat around 300° C for core curing process. Hence, a process had to be explored that didn't require any heating.

Various options were considered: A core centre costed around ₹560 lakhs and the payback period was around five years; a multi-station machine costed ₹110 lakhs per annum and the payback period was coming to be 10 months. Resorting to these conventional ideas didn't align with the company's frugal approach as these would have led to discarding of the existing machines.

The team with a robust TPM approach, operation excellence and robust planning took up the challenge to convert the existing 35 years old equipment to Global Cold Box technology.

Cold Box process requires absolutely no heating. It's a chemical bonding reaction which is carried out at ambient temperature against heating of the die upto 300° C earlier.

Here, there is no fatigue to the associates working at that stage and it's highly safe to operate.

Hurdles encountered

However, while implementing the project, the company had to tackle many issues and make modifications:

Machine Modification: Earlier machine was of open chamber type to support Die heating through PNG Gas but cold box core making process requires closed chamber to avoid Amine gas Leakages. The gas burner used for heating of the Cores is been converted into an Integrated Amine Purging unit required for the desired process.

Die Modification: Conversion of existing dies to suit Cold box where highly precise sealing is needed at the parting line to ensure gassing and curing of cores.

Amine Gas Generation Panel: It's highly unsafe to transport gaseous Amine so custom designed Amine Gas Generation Panel was installed to convert the liquid Amine to gaseous Amine used for gassing and purging of cores.

Neutralizing Residual Amine Gas: Gaseous Amine is highly dangerous to the environment. Hence, custom-designed water-based Scrubber unit was installed to neutralize residual Amine gas.

Efforts recognized

This was the first time in the foundry industry that an existing Shell box machine was converted into Cold box machine. Accomplishing this conversion under the theme of flexible manufacturing without a single day production loss and achieving productivity enhancement by 38 percent, depicts the true demonstration of Mahindra Rise Philosophy. 

Challenge & Solution

3Ps Problem

To enhance productivity and quality of associates' work life, and address CO₂ generation.

Solution

Implementation of cold box process for core making.

EVENT CALENDAR		
EVENT NAME	CONTACT	DATE & VENUE
EMO HANNOVER 2017	T: +91 (22) 6687 550 001 E: info@hmf-in www.emo-hannover.de	September 18-23, 2017 Hannover, Germany
MANUFACTURING SOLUTIONS EXPO 2017	T: +65 (68) 263 000 E: jolintan@sph.com.sg www.ms-expo.com	October 25-27, 2017 Singapore EXPO, Singapore
BLECHEXPO 2017	T: +49 (0) 7025 9206-0 E: info@schall-messen.de www.blechexpo-messe.de/en	November 07-10, 2017 Stuttgart, Germany
AUTOMOTIVE ENGINEERING SHOW CHENNAI	T: +91 (22) 6144 5900 E: info@india.messefrankfurt.com www.aes-show.com	November 09-11, 2017 Chennai Trade Centre, India
MACHINE TOOL INDONESIA 2017	T: +62 (21) 252 5320 E: maysia@pamerindo.com www.machinetoolindonesia.com	December 06-09, 2017 The Jakarta International Expo, Kemayoran, Jakarta, Indonesia
IMTEX FORMING 2018	T: +91 (80) 6624 6600 E: imtma@imtma.in www.imtex.in	January 25-30, 2018 Bangalore International Exhibition Centre (BIEC), Bangalore, India
DIE & MOULD INDIA INTERNATIONAL EXHIBITION	T: +91 (22) 2852 6876/2850 8976 E: tagma.diemould@tagmaindia.org www.diemouldindia.org	April 11-14, 2018 Bombay Exhibition Centre, Goregaon, Mumbai, India
ACMEE 2018	T: + 91 (44) 2625 0489 E: info@acmee.in www.acmee.in	June 21-25, 2018 Chennai Trade Centre, Chennai, India
JIMTOF 2018	T: + 81 (03) 5530 1333 E: jimtof@tokyo-bigsight.co.jp www.jimtof.org/en	November 01-06, 2018 Tokyo International Exhibition Centre, Japan
INTEC 2019	T: + 91 (422) 2222396 E: intec@codissia.com www.intec.codissia.com	June 06-10, 2019 CODISSIA Trade Fair Complex Coimbatore, India
To suggest an event, please send details to soumi.mitra@magicwandmedia.in		



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LEVERAGING THE POWER OF EXAMPLES

To recognize the capabilities and attributes that differentiate top performing manufacturing companies and encourage others to implement them for achieving significant results, the Indian Machine Tool Manufacturers' Association (IMTMA) organized the 11th edition of National Productivity Summit (NPS) on August 04-05, 2017 at Hyatt Regency, Pune. A sneak peek into the event...

P K CHATTERJEE
Senior Correspondent
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The Indian manufacturing industry is a witness to companies striving relentlessly to increase their productivity, reduce costs, and enhance and sustain competitiveness. By organizing the National Productivity Summits that highlight and applaud the projects which have excelled in achieving outstanding performances in manufacturing, IMTMA has positioned itself in the forefront to champion the cause of providing solutions to the productivity challenges faced by the industry.

Girish Shankar, Secretary, Department of Heavy Industry, Government of India and Shishir Joshipura, Managing

Director, SKF India, graced the occasion as the Chief Guest and Guest of Honour respectively. With insightful industry visits, enriching key notes and interesting live case study presentations, this year's summit made for a repeat edition of its legendary success.

Keynotes that inspired

As part of the Summit, industry leaders shed light on their executed practices and shared their expertise and experiences. Sunil Kaul, Group President, Excellence in Manufacturing, Innovation and Technology, ANAND Automotive, revealed the "Quality Culture at ANAND - Leader Led Transformation

for Zero Defect". Dattatreya Gaur, Vice President and Business Unit Head, Robert Bosch Engineering and Business Solutions, enlightened the participants on the "Relevance of Smart Manufacturing in the Indian Context". Ravi Damodaran, President, Technology & Strategy, Varroc Engineering, presented his take on the "Challenges in Manufacturing Productivity - The Way Forward". Parag Satpute, Managing Director, Sandvik Asia Pvt Ltd elaborated on the ways to Maximise Productivity through sustained Innovation.

IMTMA - ACE Micromatic Productivity Championship Awards 2017

IMTMA strongly believes in acknowledging efforts of those who have been instrumental in productivity improvement in the Indian manufacturing industry. With this objective, it has instituted the Productivity Championship Awards to felicitate them with cash prizes worth ₹10 Lakhs. ACE Micromatic Group graciously sponsored the Productivity Championship Awards 2017.

Selection parameters for winners

A competitive process is used to

Industry stalwarts at the inaugural ceremony of the NPS 2017.



Source: Magic Wand Media Inc



Source: Magic Wand Media Inc

bring the highest objectivity in identifying and rewarding the productivity champions. Entries in the form of case studies are called from a wide spectrum of the manufacturing industry, describing the productivity improvement projects implemented by them. These are examined critically for their intrinsic merits and the breakthrough achievements that have brought in significant competitive advantages to these companies by an independent screening panel, in the areas of Productivity, Technology, New Equipment Design, Solution to challenges in manufacturing and so on. The short-listed case studies are then presented at the National Productivity Summit. Based on the presentation and the interactions with the jury and the delegates, the awards are decided. This year the jury comprised N Ramanathan, an Independent Counselor in Quality-based Management engaged in training and counseling select companies; T Parabrahman, an Independent

Director on board of BFW, a member of CII Karnataka State Council and a member of the advisory committee for development of a new generation shuttle-less loom; and AV Govekar who has over 40 years of experience in Quality Assurance, Production, Planning and Supply chain Management functions across various types of production volumes.

Best practices recognized

Out of the eight case study presentations at the Summit – Bajaj Auto, Hero Motocorp, Mahindra & Mahindra, Mahle Behr, Titan Company, TVS Motor Company and WABCO India -- that contested for the Awards, Mahindra & Mahindra was declared the winner for accomplishing the almost impossible feat of converting an existing Hot Core box to Cold box process to make shell cores without stopping production for a single day. By doing this modification of equipment and Die for core making, it overcame

Proud winners of the ITMA - ACE Micromatic Productivity Championship Awards 2017.

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Crystal Trophy
and Certificate

Second Prize Winners
₹2 lakhs,
Crystal Trophy
and Certificate

Third Prize Winners
₹1 lakh,
Crystal Trophy
and Certificate

a productivity bottleneck, significantly reduced rejections and reduced cost of production. Carbon Foot Print reduction was an additional benefit. WABCO India and Bajaj Auto, Waluj was the first and second runners-up, in that order. WABCO India, Chennai, struggled with 40 variants in mass manufacture of compression-brake units for vehicles. Innovative use of QR code on nameplate for automated variant switchover on production line, along with systematic use of Lean methodology, better cutting tools, cutting parameters and reducing setup change time to accommodate more variants resulted in an increased machine availability to 94 percent.

Bajaj Auto, Waluj eliminated manual errors in inspection, recording, sorting, analysis and diagnosis of maintenance related activities. On its journey to becoming an Intelligent Factory, it automated its TPM dashboard with maintenance records, manuals, machine monitoring and diagnostics, resulting in increased uptime of mass production machines by 25 percent and de-skilling routine maintenance work.

The next National Productivity Summit will be held in Chennai to yet again serve its purpose of acknowledging industry's best manufacturing practices and encouraging others to follow suit.



Source: Magic Wand Media Inc

The panel of jury members listening to the presentations of the contestants at the National Productivity Summit 2017.

(L-R): P Ramadas, Vice President, IMTMA; V Anbu, Director General & CEO, IMTMA; Rattan Kapur, President, ACMA; and PG Jadeja, President, IMTMA at the opening ceremony of DMTX 2017.



Source: IMTMA

MARKING ANOTHER EPISODE OF STELLAR SUCCESS

The second edition of the Delhi Machine Tool Expo held at Pragati Maidan, New Delhi from August 10-13, 2017, turned out to be a major success owing to a strong presence of industry players and experts. Organized by the Indian Machine Tools Manufacturers' Association (IMTMA), the event effectively provided solutions to challenges faced by the manufacturers of Northern region of the country. A glimpse of how it panned out.

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With 242 exhibitors from 10 countries, the event played host to 11,279 visitors from various industries such as auto component, automobiles, capital goods, defence, aerospace and

railways. Around nine foreign countries: Czech Republic, Germany, Italy, Japan, Korea, the USA, China, Taiwan and Australia participated in the exhibition and around 93 trade delegations from High

Commissioner of Nigeria, COFMOW (Railways), Ordnance Factory Board, Maruti Udyog, Honda Cars and BHEL visited the expo. Distinguished industry stalwarts graced the inauguration ceremony.



"To stay ahead of the game, Indian machine tool manufacturers need to improve speed and precision of machining, which demand investment in innovation and R&D."

Rattan Kapur
President
ACMA



"We have received great response from various manufacturing industries in the Northern region."

P G Jadeja
President, IMTMA &
CMD, Jyoti CNC Automation Ltd



"The success of DMTX gives impetus to our idea that the regional machines tools are the way forward to address the requirements of the OEMs as well as component manufacturers in the Tier II and Tier III cities."

V Anbu
Director General & CEO
IMTMA

ony with their presence. PG Jadeja, President, IMTMA; V Anbu, Director General & CEO, IMTMA; P Ramadas, Vice President, IMTMA; and Rattan Kapur, President, Automotive Component Manufacturers Association of India (ACMA) addressed issues the industry currently encounters.

Participants' perspective

Zavenir Daubert, through its participation in the event, aimed to connect with the key players of machine tool industries and the SMEs spread across North India from the nearby states of Haryana, Uttarakhand, Uttar Pradesh and Rajasthan. "We believe that our products will contribute to the improvement of quality and productivity in Indian production market," stated Shuhei Matsui, General Manager - CNC Systems, MEI. "In line with our customer-centric mantra, we look forward to meeting our existing customers and acquiring new customers at DMTX to strengthen and expand our network," said Himanshu P Shaparia, Vice President-Sales, Jyoti CNC Automation Ltd. Gravotech Engineering Pvt Ltd

unveiled its modified Technifor range of permanent marking machines for the Indian users, which can be carried along to mark even big components. "It took us time to understand how this market works. But today we have a place here and we are quite optimistic about it," said the company's Managing Director Ludovic Navarro.

Special focus

In today's complex manufacturing process, accuracy and precision play an important role to define the quality of finished products, which require high level of detailing and low tolerance. Hence, DMTX 2017, to help industry players keep

pace with the changing times, integrated two shows with a special focus on metrology and welding: METROLOGY EXPO for testing instrument, metrology and equipment; and WELDEXPO for welding, cutting and joining.

Trends in metrology

The Indian automotive sector, predominantly, has been the growth accelerator for the metrology segment. "Over the last few years, quality consciousness has greatly increased among customers, which is a major factor behind our rapid expansion," stated Anup Verma, Managing Director, Hexagon Metrology

Visitors learning about the latest products at exhibitor booths at DMTX 2017.



Source: IMTMA

India Pvt Ltd. Advitiya Goel, Assistant Manager, Sales & Marketing, APM Technologies, said, "In Indian market, the demand for metrological products is increasing exponentially. Earlier the Indian customers were interested in tactile measurement, now they are shifting towards 3D digital measurement technology."

Strong visitor participation

The event attracted impressive number of delegates and visitors from the Tier II and Tier III cities such as Jagadhri, Sangrur, Rudrapur, Chandigarh, Ludhiana, Jalandhar, Manesar, Faridabad, Panipat besides visitors from the neighboring states of Rajasthan, Uttar Pradesh, Himachal Pradesh, Uttarakhand and others.

A visitor from Delhi, SK Bansal, Director, Gayatri Technology, wanted to explore hydraulic presses at the expo and was happy with the wide array of products exhibited by Indian manufacturers. "It is a brilliant attempt by IMTMA to organize one such event in North where we can see and select products befitting our need," he remarked. Anil Kumar Saxena from Shriram Pistons & Rings Ltd, who hailed from Ghaziabad keen to learn more



"As the backbone of manufacturing, the machine tools industry has the potential to play a catalyzing role in the Indian manufacturing industry."

Hung Yang
Director of Bureau of Foreign Trade,
MOEA Economic division
Taipei Economic and Cultural Centre
in India

on metallurgical techniques, noted, "I am quite satisfied with the expo and hope it comes back with more information next year." "This is a grand show displaying several types of technologies and their applications," said OP Nangia of Stead Electronics (India) Pvt Ltd.

Taiwan ties

Encouraged by the positive business environment of the country and its demand for high-level machine tools, the Taiwan External Trade Development Council (TAITRA) along with eight Taiwanese machine tool manufacturers

participated for the second time in the Delhi Machine Tool Expo. At the press conference held by TAITRA, Hung Yang, Director of Bureau of Foreign Trade, MOEA Economic division, Taipei Economic and Cultural Centre in India highlighted the benefits both countries can reap through their symbiosis, "As the backbone of manufacturing, the machine tools industry has the potential to play a catalyzing role in the Indian manufacturing industry. We hope that India can benefit from Taiwan's formidable expertise in manufacturing and Taiwan can help augment the indigenous capacity and fill the gap in India for manufacturing solutions."

At the event, Tongtai Machine & Tool Company Ltd debuted its first machine collaboration with Lokesh Machines - EZ-5 Drilling & Tapping Center, an advanced model suitable for automotive industry.

It's Pune next

Expressing his views over the success of the event, Anbu said, "The second edition of the Delhi Machine Tool Expo, the fourth in the series, was a success. The exhibitors were also happy that the show managed to attract visitors from smaller manufacturing hubs from Northern region. This further gives impetus to our idea that the regional machines tools are the way forward to address the requirements of the Original Equipment Manufacturers, as well as component manufacturers in the Tier II and Tier III cities."

With the same aim and enthusiasm, the next Regional Machine Tool Exhibition will be the second edition of Pune Machine Tool Expo, which will be held from September 27-30, 2018, before its comeback to Delhi in 2019.

The event attracted impressive number of delegates and visitors from Tier II and Tier III cities of North India.



Source: IMTMA

QUICK-CHANGE PALLET MODULES

SCHUNK at
EMO
Hannover
 18-23.9.2017
Hall 3
Booth E55

The VERO-S NSE3 138 quick-change pallet module disposes of high pull-down forces and a high rigidity. On option, kit can be equipped with a cone seal that prevents chips or dirt from lodging in the changing interface. The VERO-S NSE-T3 138 version is additionally available for the use on tombstones.

SCHUNK, the competence leader for gripping systems and clamping technology, has introduced two premium quick-change pallet modules with unique features: The VERO-S NSE3 138 quick-change pallet module and the VERO-S NSE-T3 138 tombstone module. Their most striking feature is an optional spring-actuated cone seal that automatically locks the module's changing interface as soon as the clamping pin is lifted. In combination with the integrated blow-out function, the quick

Source: SCHUNK Intec India Pvt Ltd

The new premium modules from SCHUNK are fully compatible with the previous VERO-S modular system, which now consists of more than 1,000 possible combinations for highly efficient workpiece clamping.

lock prevents chips or dirt from lodging into the interface. Without changing the height, it locks the last gateway of the otherwise completely sealed modules.

Increased pull-down force and rigidity

SCHUNK has boosted the performance characteristics of the VERO-S NSE3 138 as compared to previous top sellers. An enormous pull-down force of 8,000 N or 28,000 N with activated turbo function as well as increased dimensional stability for the module body have a positive impact on the rigidity of the clamping

solutions. Thus, even the highest tilting moments and transverse forces can be reliably absorbed when parts are clamped at the base or machined on at height, for example. Clamping and positioning also occur via a short taper with a repeat accuracy of < 0.005 mm with the premium modules. This ensures maximum precision even in the most demanding applications. Due to the conical fitting, the clamping pins can also be joined into the modules eccentrically, making this process incredibly easy. The actual clamping is done via spring force without any external energy supply; it is form-fit and self-locking. The workpieces remain safely clamped in case of a sudden pressure drop in the air system. A pneumatic system pressure of 6 bar is sufficient to open the clamping modules.

Convenient monitoring

For maximum process reliability, both clamping slide positions "open" and "closed" can be queried as standard using dynamic pressure. On option, a position sensor can be used, which additionally detects a locking process without pins. Depending on the thread, diameter of the clamping pins have holding forces of 35,000 N (M10), 50,000 N (M12), or 75,000 N (M16). All components, such as base bodies, clamping pins, and clamping slide, are made of hardened stainless steel, making them absolutely corrosion-resistant and extremely long-lasting. Special support areas facilitate cleaning and ensure a perfectly flat contact surface for the clamping devices and workpieces. The new premium modules are fully compatible with the previous VERO-S modular system, which now consists of more than 1,000 possible combinations for highly efficient workpiece clamping. 



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Source: SCHUNK Intec India Pvt Ltd

HIGH-SPEED TOOL BREAKAGE DETECTION SYSTEM

The new programmable system is for non-contact checking of high speed tools, particularly committed to those applications where there is the need for hi-speed spindles up to 80,000 rpm.

MARPOSS at
EMO
Hannover
18-23-9-2017
Hall 6
Booth B34

Marposs S.p.A.'s Tool Breakage Detector (TBD) is a time-saving laser-based solution for tool breakage detection in a machine. TBD on milling machines and machining centres help to keep the process under control, thanks to a very short tool checking cycle. Fast and reliable detection achieved by the TBD reduces production time and avoids expensive work-pieces scrap due to wrong cutting process by damaged or broken tools. All functionality is contained within the TBD unit compact housing, which can be mounted outside the machine area, saving space on the table.

Source: MARPOSS INDIA Pvt Ltd

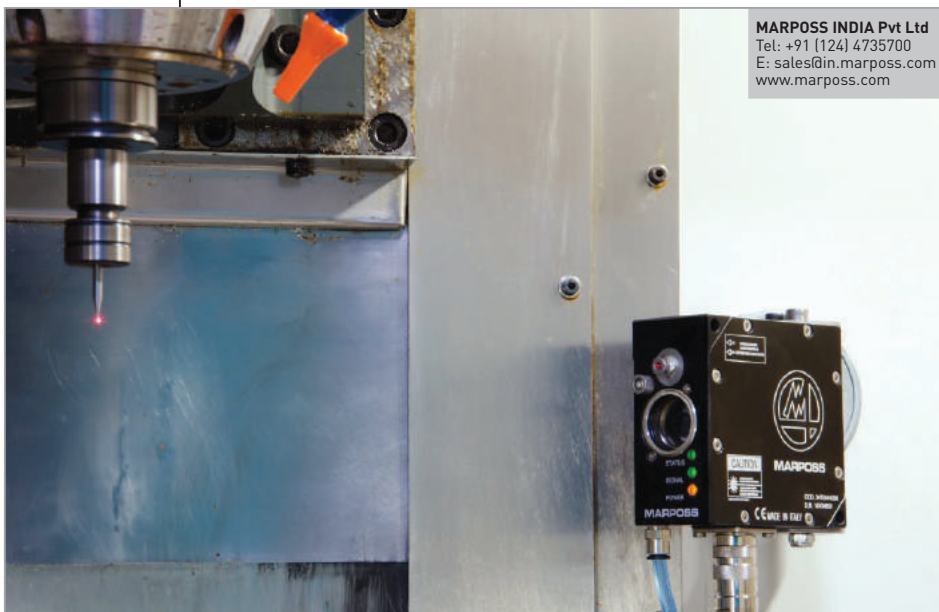
Switching the power to the maximum gets the detector to recognize a tool placed at a longer distance (up to 2m), with a standard capability to check the breakage. If a smaller tolerance is required, the reduced power can be set obtaining a smaller beam. Furthermore, a user can choose the filtering level of the signal. In fact, during the checking cycle, some coolant drops could interrupt the beam or coolant stuck on the tool could create variation in the signal received. Setting it on "Hi Filter" makes the software of the TBD more restrictive in order to give a more reliable response. On the other hand, choosing "Low Filter" helps it respond in a faster way, as the filter is less severe.

It is also possible to choose the appropriate range of spindle speed up to 5000 rpm.

The new TBD HS

Marposs S.p.A. has recently introduced a new programmable system, TBD High Speed (HS), for non-contact checking hi-speed tools, particularly committed to those applications where there is the need for hi-speed spindles, up to 80,000 rpm

Thanks to its rotary switch selector, the TBD HS is able to recognize the tool in two different ways, depending on the actual rotational speed, thus minimizing cycle times, generally crucial in this kind of process. On selecting "Quick Recognition", the tool checking is performed for 10,000 rpm spindle speed and its multiples; on the other hand, it is possible to choose "Hybrid Recognition" if the speed is 1,000 rpm and its multiples or 10,000 rpm and its multiples. With a reflective, clean tool an impressive 150 msec checking time is achieved, approximately half the time compared to the standard TBD. High spindle speeds and small tool dimensions lead to the need for a fine adjustment for positioning the TBD HS in a very precise way. Once TBD is installed and the tool approximately pointed, now it is even more quick and simple to optimize the laser beam and find the checking position. 



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Source: MARPOSS INDIA Pvt Ltd

Inserts and Cutters

CNMM inserts for heavy engineering applications

The inserts can help achieve ideal cutting parameters with low noise.

Dormer Pramet's CNMM inserts with OR chip breaker and T9315 grade can be used for heavy duty casting applications. The T9315 is an extremely heat-resistant high-performance grade. Its layer construction makes the cutting material more stable, harder and more resistant to plastic deformation and built-up edge. Its exceptional resistance to cracking and fatigue is instantly noticeable when machining the rotor shaft. The inserts can help achieve ideal cutting parameters with low noise.

It is a preferred cutting tool provider to heavy engineering industry including wind power industry. Covering maintenance departments and fabrication workshops to international suppliers for the railway, automotive and aerospace industries, Pramet's product program is one of the widest in the market. Its expertise in heavy engineering applications include tooling for heavy roughing (turning & milling), bar peeling, scarfing, special threading and tube chamfering.

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Precision machining

Whirling machine to process EPS screws

The LWN 100 enables finish machining of screws for electric power steering (EPS) technology with minimum space requirements at maximum quality.

LeistritzProduktionstechnikGmbH'sLWN100,thenewwhirling machine is able to reliably process EPS screws with a module from 0.8 to 3 and a swivelling angle of up to 42 degrees twice as quickly as other production processes. This is possible for the usual diameter of 14 to 30 mm and a length up to 220 mm.

The new machine speeds up production, and also helps to protect the environment and reduces operating costs. Thanks to the dry machining on the LWN, there are no cooling lubricant costs, resulting in savings on parts cleaning costs. At the same time, the short cycle times contribute to the unprecedented level of economy of the LWN 100 for EPS screw machining. There is no need for a subsequent grinding process.

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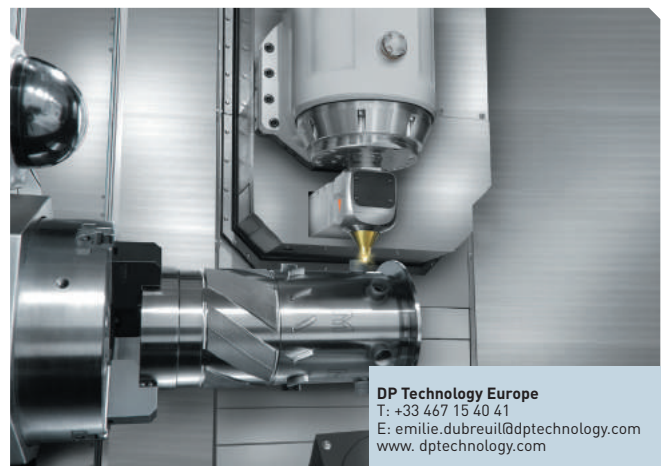
The ESPRIT Additive Suite from DP Technology is a comprehensive 3D printing solution that delivers high levels of efficiency and accuracy, while simplifying the time-consuming additive manufacturing process into a few easy steps. It delivers machine-optimized job files and complete control of the additive manufacturing process for both direct metal deposition machines and 3D powder bed fusion systems. The software will make its debut at EMO Hannover, September 18-23, with general end-user availability expected in mid-2018.

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Company Index

Accurate Gauging & Instruments Pvt Ltd	46
Ace Manufacturing Systems Ltd	36
Ace Micromatic Group	62
ACMA	64
Adani Group	16, 46
Agathon	18
Airbus	20
Anand Automotive	62
APM Technologies	64
Bajaj Auto	62
Bharat Foils Ltd	50
Boeing	20
CECIMO	28
Chennai Metco	36
Commercial Aircraft Corp of China (COMAC)	42
Doosan Infracore	42
Dormer Pramet	69
DP Technology Europe	69
Excelco/Newbrook Inc (ENI)	42
Forbes and Company Ltd	36
Galdabini SPA	28
GFE	24
Gravotech Engineering Pvt Ltd	64
Grind Master Machines Pvt Ltd	36, 46
Hartmetall-Werkzeugfabrik Paul Horn GmbH	24
Hero MotoCorp	62
Hexagon Metrology India Pvt Ltd	64
Hindustan Aeronautics Limited (HAL)	18
Hypertherm India	50
Hyundai Motors	18
IIT Madras	54
IMTMA	6, 8, 12, 16, 36, 46, 54, 58, 62, 64
Isgec Heavy Engineering Ltd	46
Jyoti CNC Automation Ltd	36, 46, 64
Lakshmi Machine Works Ltd	46
Leitzstritz Produktionstechnik GmbH	69
Lokesh Machines	64
Mahindra & Mahindra Ltd	58, 62
Mahle Behr	62
Marposs India Pvt Ltd	68
MEI	64
Micromatic Grinding Technologies	54
Micromatic Machine Tools Pvt Ltd	14
National Institution for Transforming India (NITI Aayog)	16
Robert Bosch Engineering Business and Solutions	62
Saab	16
Sahajanand Laser Technology Ltd	46
Sandvik Asia Pvt Ltd	62
Sandvik Coromant	42
Schneider Electric India	18
Schunk Intec India Pvt Ltd	67
SKF India	62
Stamp IT Robotai & Solutions Pvt Ltd	36
STIMS	54
Taiwan External Trade Development Council	64
Titan Company	62
Tongtai Machine & Tool Company Ltd	64
TVS Motor Company	62
UCAM Pvt Ltd	36, 46
UCIMU-SISTEMI PER PRODURRE	32
VDMA India	18, 36
VDW	24, 36, 46
WABCO India	62
Yamazaki Mazak India Pvt Ltd	17, 40
Zavenir Daubert	64

Advertiser Index

Accurate Sales and Services Pvt Ltd – www accurategauging.com	35
Ace Manufacturing Systems Ltd – www.amslin	9
ACMEE 2018 – www.acmee.in	11
Apex Precision Mechatronics Pvt Ltd – www.apexprecision.co.in	15
Beckhoff Automation Pvt Ltd – www.beckhoff.co.in/cnc	23
Chennai Metco – www.chennaietco.com	17
IMTEX FORMING 2018 – www.imtex.in	71
INTEC 2019 – www.intec.codissia.com	57
Jyoti CNC Automation Ltd – www.jyoti.co.in	3
Khushbu Engineers – www.khushbuindia.com	21
Lakshmi Machine Works – www.lmwnc.com	19
MARPOSS INDIA Pvt Ltd – www.marposs.com	53
Mitsubishi Electric India Pvt Ltd – www.mitsubishielectric.in	7
Rajamane Industries Pvt Ltd – www.khushbuindia.com	33
SCHUNK Intec India Pvt Ltd – www.schunk.com	2
TaeguTec India Pvt Ltd – www.taegutec-india.com	72
UCAM India – www.ucamind.com	45
Wendt (India) Ltd – www.wendtindia.com	61
Yamazaki Mazak Pvt Ltd – www.mazakindia.in	30-31



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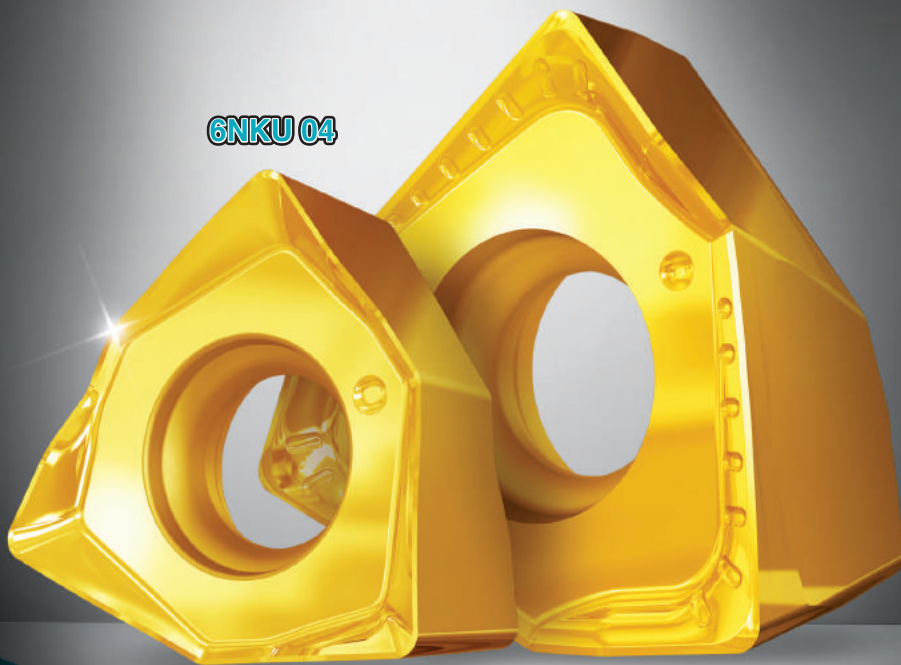


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