

IMTEX 2015 Showcases Innovations, Technologies & Solutions to enable 'Make in India'

Technical Closing Report on the IMTEX 2015 and Tooltech 2015 held from 22 to 28 January 2015

'IMTEX 2015 and Tooltech 2015', South East Asia's largest exhibition, organized by the Indian Machine Tool Manufacturers' Association from 22 to 28 January 2015 concluded at the Bangalore International Exhibition Centre. Over 1000 exhibitors from 24 countries from all over the world showcased production technologies of the future. IMTEX 2015 which exhibited innovative technologies for increasing productivity and optimising resource utilisation is hoped to be a great enabler of the 'Make in India' initiative.

IMTEX as an event has consistently showcased numerous technologies and machines to industry players. The solutions displayed at the seventeenth edition of the exhibition were one step ahead. Focus was on innovations that would give a boost to the manufacturing sector of India. The showcasing of many new technologies has ameliorated the conditions for global competition.

The technology show created quite a buzz and attracted many eyeballs keeping in sync with the prevailing business environment and neo-positive sentiments. Live display of new machines, both indigenous and foreign made the show quite impressive.

A – TRENDS DISPLAYED BY INDIAN EXHIBITORS

With the 'Make in India' initiative providing a boost to the Indian manufacturing sector many new technologies such as multi-spindle and multi-turret turning centres gained popularity. Machining centres with higher precision, higher speeds, high stability and static rigidity were on offer. The use of quick setting tools and work fixtures picked up. Now these are offered indigenously. The exhibition also had some green initiatives like coolant purification and shop air cleaning solutions. Vision based inspection gained popularity where both 2D and 3D measurements are offered. Vision based re-engineering systems are also popular. Indigenous developments in testing equipment are evident from the display of hydraulic servo exciters and spindle testing, gear testing, air leak detector and testing machines.

From technical point of view, numerous productivity improvements are offered by various Indian manufacturers, driven by major user industries, predominantly by the auto industry. Some of these are the use of higher spindle speeds and feeds, Automation (use of Robots and gantry manipulators for safe & fast part handling,) use of coated inserts and special tooling, special job fixtures enabling multi face machining in single set up, in-process/on machine inspection, use of multi-tasking machines, and use of operator friendly CAD/CAM software to improve productivity and easy programming.

Initiatives on metrology and measurements included hand held 3D measuring systems as well as machine mounted pre/post process inspection systems using touch probe, laser scanners and vision/image processing technologies.

Indigenous R&D initiatives from various companies as well as academic institutions were on display in a separate arena. These included nano positioning systems, aerostatic spindle bearings, spindle rotation analyzers, linear and magnetic scales and vision based nano level measurements.

To enhance cutting tool performance and better surface finish in addition to extending tool life and cutting oil life highly efficient, GHS compliant cutting fluids were displayed.

The machine tool industry of India has shown tremendous improvements in terms of aesthetics which are at par with international observations. IMTEX 2015 saw the launch of several new models. These were the Vertical Turret Lathe, the CNC Twin Spindle Turn Mill Centre with Y-axis and the CNC High Speed Vertical Machining Centre — all these machines are being used in the defence and aerospace sectors, apart from the automotive sector.

B – TRENDS DISPLAYED BY INTERNATIONAL EXHIBITORS

International trends followed by foreign companies could be seen in the use of touch screen monitors, multi-tasking in single machine (raw material to finished component in a single set up), special tool geometries and coatings for machining SS, Titanium, Titanium-aluminide, Inconel, difficult to machine alloys and composite materials.

Also on display were single unique geometry insert for all types of materials, reduced cycle times with high slide acceleration (>1G), high slide velocity (>80 m/min rapid, & >10 m/min feed rates), fast tool changes (<1 second), multiple tool spindles / turrets, and use of carbon nano fibers for structures to improve strength to weight ratio. Screwless workholding fixtures, additive technologies, and 3D printing were the other highlights. Foreign companies gave maximum attention to aerospace, automotive, energy and medical sectors as these are the upcoming sectors highly influenced by the machine tool development

Multinational companies also exhibited multi-tasking in a single machine. This is futuristic technology. A single machine would handle several machining operations. This will result in reduction of change-over time and improve the component accuracy levels. Such machines enable users to execute not only turning, milling and drilling operations but also deep-drilling, grinding and honing. The aim here is to do multi-tasking.

C - TECHNOLOGY BREAKTHROUGHS

Examples are presented below of the new introductions on which the machine tool industry is focusing. These technologies were evident in the respective stalls of the companies.

Y-Axis on CNC Turn Mill

CNC Turn Mill center with Y-axis developed by Jyoti CNC, Rajkot is one of the latest technologies to enhance productivity. Milling operation by interpolation of C and X or Z axes is widened by adding Y-axis. This is an excellent technological edge for multi-tasking & cycle time reduction and results in greater productivity.

Unmanned Tool & Cutter Grinding

Tool & Cutter Grinding Machine with AWC (Automatic Wheel Changer) and AWH (Automatic Work Holding) is a new product developed by Kennametal, Bangalore. The machine is completely unmanned and highly productive. The machine is built with a regular CNC controller and customized with dynamic graphics and pictorials to help even an unskilled operator to easily program the machine.

Single Setup Crank Shaft Grinding

CBN Crank shaft grinder from Bestek Industries is a new product which helps in elimination of multiple setups. Journal and pin grinding in a single setup on single machine adds value in terms of accuracy and productivity. This is one of the best technology products witnessed.

Electro-Mechanical Table Top Broaching

Electro-Mechanical Table Top Broaching machine developed by MTE Industries, Hyderabad, is a new technological approach for vertical configuration. Usually the vertical broaching machines are not easily re-positioned once installed as a portion of the machine need to have space below ground for easy loading and unloading. However, MTE has come out with a new concept to create a machine which can be placed and moved any number of times as per requirement without compromising the ergonomics and utility of the machine.

Twin Spindle Horizontal Machining for Higher Productivity

Twin spindle Horizontal machining center developed by ACE Manufacturing System, Bangalore, is a new product developed for higher productivity. Twin spindle machines enhance the production 200 per cent whereas in the new machine increase in space and cost is only 30 per cent.

Technology and Automation

It was observed that many exhibitors showcased their products with multiple use of single robot specifying the operations for job loading/unloading, acceptance/rejection, machine door closing/opening, and job deburring and job inspection. The complete machining of jobs for enhanced productivity with the aim of performing several different machining operations on a single machine was displayed.

Cryogenic Machining Technology (A green initiative)

A new trend on Cryogenic Machining Technology (5 ME) was introduced by MAG. SME's unique, multi-patented cryogenic machining process is a breakthrough technology that enables higher cutting speeds for increased material removal and longer tool life by transmitting liquid nitrogen at -321° F through the spindle/turret and tool body, direct to the cutting edge. Cryogenic technology makes new installations less expensive and reduces energy consumption, and provides an improved working environment for worker health and safety.

Automatic on Machine Measurement

Graphical Profile Grinder DV-1 introduced by Japanese manufacturer, AMADA is a state-of-the-art digital machine featuring the use of a CCD camera for automatic on-machine measurement and automatic compensation, and can solve problems encountered by a conventional projector such as quality fluctuation, ultrafine work piece grinding and efficiency.

High Precision CNC Creep Feed Grinding

Cosmos in collaboration with a German firm, JOEMARS developed a Creep Feeding Grinding Machine with innovative configuration for maximum rigidity and protective seals for the machine spindle bearings and guideways from entry of grinding dust.

Deep Hole Drilling

UK based Mollart has come up with dedicated Deep Hole Drilling Machines in the diameter range of 0.5 mm to 150 mm with drilling depths up to 3000mm and special applications up to 12 metres hole depth.

Weight-optimised External Reamers by Laser-sintering Process

Weight optimisation of the tools immediately brings noticeable increases in productivity. Conventionally manufactured steel tool for external reaming of a diameter of 8.5 mm already weighs 400 grams. This weight and the resulting inertia considerably limit the maximum possible cutting speeds. Globally known MAPAL is one of the first companies in the industry to use the additive

production process of laser sintering to optimise the weight of the external reamers. With a specially developed rib structure inside the tool (patent pending), it is now possible to produce the above-mentioned reamer with a weight of 172 grams.

Enhanced CNC System

HMT, an Indian public sector undertaking has introduced a new series of CNC system in collaboration with NUM AG of Switzerland. The key features being an enhanced servo bus, drives and simplified connectivity. The system provides optimum cost/performance ratios, and improves flexibility, scalability and accuracy.

D - GENERAL OBSERVATIONS AT IMTEX

It was observed, along with specialised machines and newer technologies covered earlier, a large cross-section of displays contained multi-tasking centres, CNC gear hobbing machines, sawing machines, CNC lathes, machining centers and special purpose machines. Few of the observations are noted below:

CNC lathes / Turning centres

Along with single spindle turning centres machines were seen with sub spindle and multi spindle arrangements. In addition to horizontal beds, slant bed machines were observed having 45°, 60, 70, 90 angles. Twin and multiple turrets were commonly observed. Machines showed multiple axes having 2 to 8 axes (X, Y, Z, C, and B).

Machining Centres

Along with common vertical spindle machines also showed horizontal spindle models, some machines had multiple axes having 3 to 8 axes (X, Y, Z, A, B). Single and multi-spindle machines could be witnessed.

CNC Grinding Machines

Gear grinders, Tool and Cutter grinders with cylindrical, universal and centreless grinding systems were observed. Both internal and surface grinding machines could be seen.

Engraving Marking Machines

Machines for engraving and marking were observed working on machining or laser or erosion technologies.

Surface Finishing Operations

Specialised machines for surface finishing were observed displaying deburring, lapping, honing, polishing and super finishing operations.

Spark Erosion Machines

Few companies displayed ECM, EDM Wire EDM, Electrolytic Metal working machines at IMTEX.

Conventional Metal Cutting

Few companies displayed conventional metal cutting machines performing drilling, milling, grinding, etc. operations.

E – GENERAL OBSERVATIONS AT TOOLTECH 2015

Cutting tools, tool holders, workholding devices, machine elements, subsystems, lubricants, testing equipment, measurement and metrology systems, controllers and various software were on display at Tooltech 2015. Few of the noticeable ones are discussed below

Cutting Tools

Cutting tools displays included carbide inserts, turning, milling, hobbing tools and sawing tools. Drilling, reaming, boring, taps, grinding wheels, dressers, deburring, honing and polishing tools were also displayed.

Tool Holders

Turning, milling cutters, boring and facing heads, and multi spindle heads were seen on display along with tool turrets, electric and hydraulic, ATC, pallets and pallet changers.

Workholding Devices

When it comes to chucks, mechanical, power operated, diaphragm, hydraulic, pneumatic and magnetic chucks were seen at stalls as well as collet chucks. Clamping devices including vices and expanding mandrels with steady and follow rests, dividing heads and rotary tables were visible whereas work handling devices included robots with enhanced automation and even grippers and fingers.

Machine Elements

Various kinds of bearings, ball screws, and linear guides were seen on display along with spindle motors, spindles, axes motors along with feed drives, guideway covers, couplings, belts, brakes, clutches, etc.

Measurements and Metrology

Gauges, callipers, digital gauges, bore gauges, height gauges, CMMs, gear testing, laser based measurements, image processing systems, optical measuring instruments, speed, temperature, pressure, noise and vibration measuring instruments, and balancing equipment could be seen.

Software

Software for programming, production planning, engineering and methods, quality control, etc., could also be seen.

Along with the above, hydraulics, pumps, motors, various valves and power packs were on display. Many companies emphasised their enhancement on lubricants and coolant systems as well as testing equipment.

F – ACADEMIA PAVILION

Collaboration between industry and academia offers mutual benefits as it facilitates innovation in industry and at the same time ensures industrial relevance in academic research. Academia Pavilion is an initiative of IMTMA to connect institutions with industry. The pavilion sees participation from leading engineering and technical institutions presenting their R&D capabilities. The first Academia Pavilion was held in 2011. The Academia Pavilion provides delegates an opportunity to interact with renowned experts and keep themselves updated with the current scenario in machine tool industry, particularly the latest technologies in machine tool building and machine tool metrology showcased by global machine tool builders.

Cash prizes were awarded to the following best displays at IMTEX 2015

- ◆ First prize: NMAM Institute of Technology, Udupi.
- ◆ Second prize: Chennai Institute of Technology, Chennai.
- ◆ Third prize: Amrita Vishwa Vidyapeetham, Kollam.
- ◆ First consolation prize: IIT, Delhi.
- ◆ Second consolation prize: IIT, Madras.

Exhibition of Academia Projects at IMTEX 2015

Twenty-five institutions that participated along with their themes are presented below:

1. Acharya Institute of Technology: Portable Induction Meter Heater - Environment and Energy Efficient.
2. Amrita Vishwa Vidyapeetham: Design and Fabrication of Metal Chip Compaction Machine and Magnetic Coolant Filter.
3. Amrita Vishwa Vidyapeetham (University): 1) A Novel Self Drilling Revolving Center, 2) A Cost effective Universal Multi-Gauge Surface Tester and 3) Brain Controlled Interface for Robotic Applications.
4. BMS College of Engineering: 1) Concept Modular Linear Hydraulic Actuator Assembly and 2) Actuator synchronization Solution.
5. Brindavan College of Engineering: 1) Concept Modular Linear Hydraulic Actuator Assembly and 2) Actuator synchronization Solution.
6. Chennai Institute of Technology: 1) Virtual Manufacturing and Robot Cell Simulation.
7. HKBK College of Engineering: Investigation of Composites, Shape Memory Alloys, Chilled and Alloyed Casting.
8. IIT Bombay: Projects on Iron & Steel - Effect of High Silica in DRI on Dephosphorization of Steel in EAF.
9. IIT Madras (Department of Mechanical Engineering): 1) Analysis of thermal deformations in wheel head spindle of a cylindrical grinding machine; 2) Design and development of micro abrasive waterjet machining system; 3) Tolerance stack-up method for analyzing precision of

assemblies of a cylindrical grinding machine and 4) Approach for estimation of volumetric accuracy of a cylindrical grinding machine tool.

10. IIT, Ropar: 1) Advancement of modulation assisted machining/drilling; 2) Enhancement of mechanical properties of light weight structural materials via friction stir processing (FSP); 3) Development of cutting tools and advanced, environmentally-friendly ionic lubricants for dry, near-dry/MQL and cryogenic machining; and 4) Investigation of surface integrity/life of machined parts for critical applications (aerospace, biomedical, etc.).
11. IIT Delhi: Machine tool spindle bearing diagnosis and prognosis kit. The system finally gives an indication of remaining useful life of the bearing.
12. KLS Gogte Institute of Technology: Projects in Metal Cutting & Automation 1) Study of input parameters, Responses, performance characteristics of Drilling, Milling Processes using Design of Experiments; 2) Design of Fixture for CNC machine to accommodate different components; 3) Parametric Analysis on Electrical Discharge machining of Al/SiCp Metal Matrix Composite; and 4) Gear Cutting on Lathe with Electronic Indexing.
13. New Horizon College of Engineering: Research work in the field of 1) Cutting Tool Engineering – Simulation and Analysis; 2) Cutting Fluid Management; and 3) Cooling Techniques.
14. NMAM Institute of Technology: 1) Investigation on Open Loop Position Control of Amplified Piezoactuator; 2) Development of Micro Electro-Discharge Machine (Micro-EDM) with in-situ tool grinding and measurement system; 3) Investigation on Mechanical Micro; 4) Design of compact air coolant system and high speed spindle cooling system for micromilling; 5) Design of piezoactuator based open loop workpiece feed control system for micromilling; and 6) Design of active workpiece vibration isolation system for tool based micromachining application.
15. PES Institute of Technology: Advanced Composites Research Projects.
16. PSG College of Technology: 1) A novel Machine Bed for Sheet Metal Cutting Processes; and 2) Investigations on Static and Dynamic Characteristics of Machine Tool Structures.
17. PSG College of Technology Robotics and Automation Engineering: Design and Development of an open CNC controlled based on LINUX.
18. R.V. College of Engineering: 1) Design and Development and Characterization of Nano Material based Multi-layered Surface Engineering Coating for Enabling Tooling and Cutting.
19. Rajalakshmi College of Engineering: 1) Reed Valve Inspection using Machine Vision; and 2) Inner Thread Inspection Using Machine Vision.
20. Sambhram Institute of Technology: Machining of Cryogenic treated Metals and Polymers.
21. SASTRA University: 1) Investigation on Aluminium based Metal Matrix Composites by Hybrid Reinforcement.
22. Sona College of Technology: 1) Innovative custom-engineering in the application of Drives and Controllers; and Innovations for the Garment Industry.
23. Sri Krishna College of Engineering & Technology: 1) Composite Materials, Welding and Sheet Metal Forming process.

24. St. Peter's College of Engineering & Technology: Balancing of Engine Test Rig Fatigue Testing Machine Hydraulic Fork Lift.
25. T. John Institute of Technology: 1) Performance analysis of mixed Non-Newtonian thermo elasto hydrodynamic journal bearing considering fluid inertia effect; 2) Direct Processing of Nano filled Long glass Fibre Reinforced Thermoplastic Composites; 3) Direct Extrusion – Compression Moulding of Long Natural Fibre Reinforced Thermoplastic Composites and their Characterization; and 4) Direct Processing of Nano filled Long Glass Fibre Reinforced Thermoplastic.

G – INTERNATIONAL SEMINAR ON MACHINING TECHNOLOGIES

IMTMA organized the sixth “International Seminar on Machining Technologies” (ISMT) on 21 January 2015, in conjunction with IMTEX 2015 exhibition at BIEC. The theme of the international seminar was “Powering Manufacturing Growth and Competitiveness”. International experts from countries like Germany, Israel, Sweden, United Kingdom, United States of America, and as well as India will facilitated sessions at the international seminar.

ISMT 2015 covered key technology areas related to metal cutting and its subsystems including two keynote addresses by *Fraunhofer IWU* and *Hero Moto Corp.*, and five concurrent sessions on Machine Tools and Machining; Work Holding, Tools and Tooling; CAD/CAM and Automation; Grinding and Finishing Processes; and Emerging Trends.

The Seminar began with an inaugural and keynote session. *Fraunhofer IWU Chemnitz*, Germany gave an ‘Overview of latest development in machining technologies’. *HeroMoto Corp.* presented on the ‘Experience of using Integrated Automation Line’.

Overview of Latest Development in Machining Technologies

Resource conservation continues to be one of the main tasks of society. It requires an increase in resource, efficiency in production processes as well as for product operations. The challenges for mechanical machining rise are due to trends of difficult-to-machine materials and improved qualities of components and surfaces.

This contribution presented new developments of production technology. The focus lay on new machine concepts, including monitoring and simulations of machining processes, resulting in increasing machine availability and process stability as well as in the reduction of primary processing times and secondary times. Innovative machining strategies were discussed, for example, 5-axis, machining and tribological optimization by preventive out-of-round machining. In addition, CNC functionalities were discussed with respect to monitoring or prevention of collisions.

The presentation was made by Mr. Peter Blau and Mr. Carsten Hochmuth, *Fraunhofer IWU Chemnitz*, Germany.

Experience of using Integrated Automation Line

Hero MotoCorp has simply not integrated machines. They have brought in automation in operation, logistics and even in environment thereby fulfilling social commitments. This keynote presentation was an eye opening one on how a major auto manufacture has moved from standalone machine automation, to machining lines and then onwards to an integrated automated factory.

This presentation was made by Mr. Ajay Sinha of Hero MotoCorp India.

Power Skiving – Economic Alternative to Shaping

Gear manufacturing and gear shaping is known to us for several decades. A new process called power skiving can be used as a replacement for gear shaping and even in some cases broaching. The presentation discussed advantages, disadvantages and process details of power skiving for gear manufacture.

The presentation was made by Mr. Heiko Meier of Gleason Pfauter.

Difficult to Machine Aerospace Materials – Challenges & Solutions

Aerospace industry in India is upcoming and is expected to grow very rapidly in the years to come. Companies who would like to enter in this arena will face machining challenges due to machinability of aerospace materials. The presentation highlighted various solutions and best practices to encourage new entrants and solve problems of current manufacturers.

The presentation was made by Mr. Brian Rego from Kennametal India.

“TURN / GRIND” Combination Technology for Economical Process Control

What are the advantages of Turn / Grind to achieve a stable Turn/Grind process? Various aspects need to be considered. These include machine's stability, rigid clamping system, inherent workpiece stability, advanced cutting materials, and inherent machine precision. All these would result in high machine capability. Examples were given on various applications where these processes are superior to the conventional one.

The presentation was made by Mr. Robert A. Seach from Hardinge, UK.

Advanced Technology for Threading & Gear Milling

This presentation compared the conventional gear hobbing process using HSS coated hobs with indexable carbide insert milling cutter used on machining centres for gear manufacturing. The use of indexable carbide cutter can not only produce gears without specialised machines but also with high level of quality and productivity. This process is suitable for gear, spline and rack manufacturing, etc. The presentation also touched upon thread milling of non-symmetric profile threads and how it can be done in the most effective manner.

The presentation was made by Ami Yacar from Vargus Ltd.

Automotive Component Solutions

Machining of automotive components continuously throws challenges of cost reduction, increasing output, reducing vibrations, effective chip breaking, higher requirements of surface finishing and tighter tolerances. Various solutions for typical automotive components will be presented on how these challenges can be overcome effectively.

The presentation was made by Mr. Sharad Kulkarni of Sandvik Coromant.

Interestingly “Boring”

Boring tools and their adjustments have hardly changed over the last few decades. This presentation discussed the development, design, and engineering of the most sophisticated accurate and easily adjustable boring tools available.

The presentation was made by Mr. Greg Cocks of Rigibore.

Workholding technology – an essential aspect of the machining process

This presentation compared clamping using round collets and hexagonal ones. It also illustrated how changeover can be done in extremely short times. If a complete chuck is to be removed and another one put in place, how can it be done in the shortest possible time? There is a possible trend of using carbon fibers as an ideal material in manufacturing chucks. This presentation also included the advantages that users can obtain from this evolving technology.

The presentation was made by Mr. Jochen Schneider from Hainbuch GmbH, Germany.

Typhoon – High Speed Jet Spindle

Currently most machining centres except for high speed machines operate at around 10,000 Rpm and often these machines have to do roughing and finishing operations. While finishing with small diameter cutting tools, this Rpm limits the cutting speed and reduces tool life. The high speed jet spindle which is driven by machine coolant can be most effectively used when such finishing operations are involved on standard machining centres used for roughing and finishing operations.

The presentation was made by Mr. Baruch Books from Colibri.

Optimization of threading process through advanced methods

The holding method of a tap often determines the quality of the tapped holes. Problems can be traced to a quick change chuck. While rigid tapping is very popular and has advantages there are a few disadvantages as well. Synchro-chuck could be a better solution. This presentation showcased how the quality of tapping and elimination of tapping problems could be achieved by the use of a Synchro-chuck.

The presentation was made by Mr. A. Nagaraj of Guhring India.

Micro – Electrical Mechanical Systems (MEMS)

We have been hearing about nano technology and micro machining for some time. It is still an emerging area for most manufacturing companies. This presentation explained in detail micro-electrical mechanical systems, its applications, application techniques and emerging trends.

The presentation was made by Prof. S. Mohan of Indian Institute of Science, Bangalore

Emergence of Vegetable Oil based Cutting Fluids for Boosting Cutting Performance

Mineral oils have been used for cutting over a long period of time. They have certain environmental issues in terms of health and disposal. Vegetable oils could be a substitute because they are environmental friendly and equally effective. The presentation touched upon the use of vegetable oils in place of mineral cutting fluids.

The presentation was made by Mr. Vrushal Phadnis of Taurilube Petrochemicals.

Innovative Cleaning Process for machined components

The disadvantages of solvent cleaning process are known to all of us. With the trend towards green technology, chlorinated solvents need to be eliminated and hydrocarbons offer a possibility to substitute TCE and PCE based solvents. The presentation discussed in detail the pros and cons of the emerging trends in cleaning solutions.

The presentation was made by Mr. Mangesh Agarwal of Durr Ecoclean India.

Emerging Trends in CAD/CAM Software & Automation

The challenges in effective utilizing of multitasking machines include lack of learning/training, programming skills, tooling, qualified engineers and inadequate software. Cloud enabled CAM software will provide consumers on demand solutions anywhere, anytime to operate their multitasking machines productively. This presentation discussed how all facets of multitasking machines can be addressed through Machining Cloud applications.

The presentation was made by Mr. Paul Ricard of DP Technology Corp.

3D Printing – Technology of the future

This presentation covered principles of additive manufacturing and its various processes, its benefits and applications, its limitations and allied technologies. Today rapid manufacturing includes additive manufacturing and allied technologies. Rapid manufacturing itself has evolved into three levels which were discussed in this presentation.

The presentation was made by Mr. K.P. Karunakaran of IIT, Bombay.

Increasing design efficiency for error free manufacturing

The latest generation of IT tools helps to design a process virtually for error free manufacturing. Titan Automation Solutions, a user of these IT tools shared their experience specifically in the area of virtual modeling for assembly and testing lines for error free manufacturing.

The presentation was made by Mr. Rajiv Bajaj, Autodesk and Mr. R. Marxmani, Titan Automation Solutions.

Precision Electro Chemical Machining

Electrochemical machining as a process has been used for deburring operations for many years. The presentation with applications discussed how this can be used for achieving finishing operations on components such as blisk, blade, disk, diffuser, in the aviation industry as well as several automotive components such as steel piston, high pressure cylinder, turbine blade, etc.

The presentation was made by Mr. Krishna Prasad Vasudevarao of EMAG India

Machining of Functional Surfaces

Super finishing of functional services has requirements of adhesion, sliding, sealing, and guiding. There are different honing processes and same was explained in detail during this presentation. An interesting and emerging area was laser structuring and laser honing.

The presentation was made by Mr. M. Waiblinger of Gehring Technologies GmbH, Germany.

Innovative Method of Internal and External Thread Grinding

This presentation discussed the advantages of using a standard CNC cylindrical grinder for doing thread grinding. This innovation helps one to create an integral pre-loaded ball screw nut and has several advantages for the user industry.

The presentation was made by Mr. Vishnu Vasudeo Mujumdar of Institute of Applied Research.

SUMMARY

IMTEX is a flagship event for the Indian Metal Cutting Industry. It is South East Asia's apex exhibition showcasing the latest trends as well as technological refinements from Indian and other global players. The mega event attracts visitors from a wide spectrum of manufacturing and ancillary industries starting with key decision and policy makers as well as industry captains who are keen to source latest technologies and manufacturing solutions from their production lines. IMTEX has come to symbolise as a one-stop forum where customers can experience 'live' display of the products enabling them in the decision making process to enhance their manufacturing capabilities.

At IMTEX 2015 and Tooltech 2015, numerous innovations were displayed in response to the latest needs of the customers. The exhibits mirrored the positive sentiments of the industry. Trends and technologies that are moving manufacturing forward are additive manufacturing, automation, modern machine shops and data-driven manufacturing.

Next IMTEX (Metal Forming) will be organized by IMTMA at BIEC from 21 January to 26 January 2016 at Bangalore. For more information, contact corpcomm@imtma.in.