

Indian Machine Tool Manufacturers' Association

ANNUAL REPORT 2014-2015





CONTENTS

EXECUTIVE COMMITTEE 2014 – 2015	03
PRESIDENT'S FOREWORD	05
68 [™] ANNUAL GENERAL MEETING OF IMTMA	09
CALENDAR OF EVENTS	11
IMTEX 2015 AND TOOLTECH 2015	15
MAJOR EVENTS AND ACTIVITIES DURING 2014 - 2015	20
TRAINING PROGRAMMES	25
ACTIVITIES OF BANGALORE INTERNATIONAL EXHIBITION CENTRE	52
WORLD MACHINE TOOL SCENARIO	54
TRENDS IN INDIAN MACHINE TOOL INDUSTRY	58
NEW PRODUCTS DEVELOPED BY MEMBERS DURING 2014 - 2015	60
NEW MEMBERS ENROLLED DURING 2014 - 2015	62



EXECUTIVE COMMITTEE 2014-2015

President

Mr. L. Krishnan Managing Director TaeguTec India Private Limited

Vice President

Mr. P. G. Jadeja Managing Director Jyoti CNC Automation Limited

Members

Mr. P. Ramadas

Managing Director Ace Manufacturing Systems Limited

Mr. Ravi Raghavan Chief Executive Officer Bharat Fritz Werner Limited

Mr. B. M. Shivashankar Managing Director HMT Machine Tools Limited

Mr. Rupesh J. Mehta

Managing Director Macpower CNC Machines Private Limited

Mr. Vijay Pratap Singh

Head – Motion Control Siemens Limited **Mr. Pradeep Pradhan** CEO – Batliboi Machine Tool Group Batliboi Limited

Ms. Sonali Kulkarni President & CEO FANUC India Private Limited

Mr. B. C. Rao Managing Director Kennametal India Limited

Mr. Rajendra S. Rajamane

Managing Director Rajamane Industries Private Limited

Mr. Rajesh G. Khatri Executive Director & CEO TAL Manufacturing Solutions Limited



EXECUTIVE COMMITTEE 2014-2015

Past Presidents

Mr. Vikram Sirur Miven Machine Tools Limited

Mr. M. Lokeswara Rao Lokesh Machines Limited

Mr. N. K. Dhand Micromatic Grinding Technologies Limited

Mr. C. P. Rangachar Yuken India Limited

Mr. V. S. Goindi Parishudh Machines Private Limited

Mr. Shrinivas G. Shirgurkar Ace Designers Limited

Mr. Bir D. Singh Voltas Limited* Mr. C. R. Swaminathan PSG Industrial Institutions*

Mr. Shailesh Sheth Simtools Limited *

Mr. S. N. Mishra Bharat Fritz Werner Limited*

Mr. Nirmal Bhogilal Batliboi Limited

Mr. Jamshyd N. Godrej Godrej & Boyce Manufacturing Company Limited

Mr. G. A. R. Shaikh Voltas Limited*

Mr. Jayant H. Shah Batala Engineering*

(*Companies represented by Past Presidents during their tenure of Presidency)

Invitees

Mr. Achal Nath

Executive Director Ashok Manufacturing Company Private Limited

Mr. Syed Amjed

Sr. Vice President-Marketing Bharat Fritz Werner Limited [Retired from Bharat Fritz Werner in October 2015]

Mr. Vivek Nigam

Business Head – Presses, Metal Cutting Machinery & Contract Manufacturing ISGEC Heavy Engineering Limited

Mr. T. K. Ramesh

Chief Executive Officer Micromatic Machine Tools Private Limited Mr. S. Sukhdial Singh

President Association of Ludhiana Machine Tool Industries

Mr. Aditya Ratnaparkhi

Chairman – "UDAAN" & Executive Director Electronica Plastic Machines Limited

Mr. Dinesh Khambhayata

President Machine Tools Manufacturers Association, Rajkot [Replaced Mr. Shailesh D. Kava as President- MTMA, Rajkot in July 2015]

Secretary and Director General

Mr. V. Anbu



New Confidence in Manufacturing Growth

India's economy was in 'recovery' mode during the last financial year and yet recorded a growth rate of 7.3%. The Indian government began a series of reforms to lift up the economy and manufacturing. Industrial output bounced back. Performance of manufacturing and mining sectors were robust pointing to industrial recovery firmly taking root and an impending turnaround in the investment cycle. The momentum if sustained will rebuild the confidence in the economy.

Indian economy is expected to grow by about 8% in the year 2015-16, as per the UN report on Economic and Social Survey of Asia and Pacific 2015 prediction. This is in line with the growth project estimates of the Government of India. In March this year, the International Monetary Fund (IMF) forecast that Indian economy is a bright spot in the global landscape and is emerging as one of the fastest-growing economies in the world.

The reforms would bring clarity on where the economy has to head. The proposed Goods and Services Tax will dismantle the existing tax barriers between states and unify India into a single market thereby making it easy to do trade. Other initiatives such as reduction of Corporate Tax from 30% to 25% over the next four years and putting on hold the provisions of the General Anti-Avoidance Rules have reduced the uncertainties.

Goods and Services Tax along with the Predictable Tax Regime will help attract fresh investments.

Growth Engine - 'Make in India'

India has embarked on a journey to make the country a manufacturing hub through the 'Make in India' initiative. Automobiles, Auto components, Biotechnology, Defence, Railways, and Textiles were among the primary sectors identified for development. To build such strong manufacturing base, focus should be on developing infrastructure and Capital Goods. Machine tool industry will be a key enabler in this journey. Once manufacturing is in top gear, country's





machine tool industry will regain its position amongst the top nations in the world. The long-term growth in demand trend of machine tools is around 15%, about 60% of the demand comprises imports. This gives opportunity for Indian machine tool industry to grow about 20% - 25% annually and increase its market share.

India's machine tool industry has good design and development capability and is able to develop most machine tools indigenously. The machines produced in India are predominantly of its own design. A hidden strength of the industry is its ability to design, engineer and manufacture a wide range of special purpose machines, by small, medium and large companies.

Leading Indian machine tool companies have in recent years acquired foreign companies or have got into strategic tie-ups to expand their product range and markets. This is in keeping with industry's vision to become a significant global player. As part of the 'Make in India' initiative, India recently tied a pact with Germany for technology upgradation. This augurs well for our machine tool industry for developing latest technology machines.

With the optimism shown for economic growth in the country, liberalisation of the defence sector, encouraging private investments and liberalising foreign direct investment in defence production and other reforms, the machine tool sector can look forward to an era of growth.

Besides Auto & Auto components, Defence and Aerospace will be key growth engines in the times to come.

Government Advocacy

After sustained advocacy with the Government of India, the machine tool industry of India and IMTMA have been able to achieve three major policy initiatives for the betterment of the industry in the last financial year. Primarily, it pertains to the Government of India's announcement of the Scheme for Enhancement of Competitiveness of the Capital Goods Industry. Under this Scheme, the Government of India has announced three major components.

The first is the creation of "Advanced Centres of Excellence" for R&D and Technology Development with National Centres of Excellence in Education and Technology such as the Indian Institute of Technology (Delhi, Bombay, Madras and Kharagpur) and the Central Manufacturing Technology Institute, Bangalore.

The second is the creation of a fund under the Technology Acquisition Fund Programme in order to help the Capital Goods Industry to acquire and assimilate specific technologies, for achieving global standards and competitiveness within a short span of time. The Technology Acquisition Fund can extend partial support to industry to enhance their technology level, for achieving superior product quality / functionality, production capacity, safety and sustainability in performance.

The third is the establishment of Integrated Industrial Infrastructure Facilities for Machine Tool Industry with a basic objective of making the machine tool sector more competitive by providing an ecosystem for production. Establishment of a machine tool park will be a step forward in making the sector cost effective, hi-tech machine tools, enhanced export capability and attracting more investment.

These three components will further strengthen the capability of the machine tool sector and increase the market share for Made in India in the home market thereby meeting the Vision 2020 strategy of the machine tool industry.

I would like to place on record the industry gratitude to the Department of Heavy Industry, Ministry of Heavy Industries & Public Enterprises, Department of Industry Policy and Promotion, Ministry of Commerce & Industry, Government of India, NITI Aayog and the Government of Karnataka. The industry was able to obtain reduction of Customs duty from 7.5% to 2.5% on critical components such as CNC systems, ball screws and linear motion guides, which are currently not manufactured in India, for CNC Turning centres and Machining centres. IMTMA is working with the Tariff Commission, Government of India to get this extended to all categories of machine tools.



As yet another milestone initiative of Government - Industry partnership, the Department of Heavy Industry jointly with Confederation of Indian Industry and industry associations have worked together to put in place a National Policy on Capital Goods & Engineering which is expected to be rolled out soon. It would be a comprehensive Policy putting in place all key parameters that are required at the institutional and industry levels and also to support mechanisms from various quarters. Many other key points such as FTA (Free Trade Agreement), CEP (Comprehensive Economic Partnership), Export promotion, Demand creation, Technology depth, etc., form part of this initiative which is aimed at furthering the growth prospects of Indian Capital Goods & Engineering sector.

IMTMA will continue its efforts on a strong policy advocacy initiative to bring greater benefit to the industry. This, it is hoped will help the industry to realize its objectives set out in the Vision document.

Our engagement will continue to be intensive with key policy makers and leverage on already existing reputation and good will.

Association Initiatives

IMTMA's Training activities and skill development initiatives have been well appreciated by the manufacturing industry. IMTMA is also certified as authorized training provider of ASME (American Society of Mechanical Engineers) accredited training courses to engineering professionals across India.

The Association has zipped ahead to bring home benefits to its members and to the customers by organizing key events such as Machine Tool Industry Summit, National Productivity Summit, International Seminar on Machining Technologies and the yearly flagship shows IMTEX and Tooltech.

IMTMA Technology Centre at Pune was formally inaugurated in December 2014. The Centre in Pune is fully equipped with latest CNC machines and allied equipment to impart training in all aspects of production technology. The Centre rolled out new courses in topics related to sheet metal forming, sheet metal die maintenance, and practical solutions for designing complex plastic injection moulds, roll forming technology and its applications.

IMTMA Design Institute is conceived as a centre with advanced facilities blended with latest design trends. The Institute imparts intensive training in all aspects of machine tool design (from fundamentals to finish) which enhances the machine tool design skill sets, makes the fresh engineers 'industry ready', and result in their better employability.

The Association's flagship exhibition IMTEX held from 22 to 28 January 2015 at BIEC was a grand success and proved to be a key enabler of the 'Make in India' initiative. It mirrored the positive sentiments of the industry as was evident from attendance of about 90,000 visitors and around INR 17,000 crores of business enquiries generated at the exhibition.

IMTMA organized two new expos in reaching out to industry requirements of the regional markets. Delhi Machine Tool Expo 2015 at Pragati Maidan, New Delhi witnessed a footfall of over 13000 visitors. Ahmedabad Machine Tool Expo 2015 at Mahatma Mandir, Gandhinagar, Gujarat attracted a footfall of about 9,000 visitors heightening expectations. These expos opened avenues for penetrating into the regional markets giving immense opportunities for various industry sectors.

India is stepping in to a new phase in manufacturing. The Machine Tool Industry's Vision envisages India to be among the top five machine tool building nations by 2020 by leveraging world class R&D, infrastructure, systems and people, delivering innovative solutions and services to create 'value for customers'. Industry needs to have a concerted focus on technology and depth, value addition, R&D, new product development, exports, etc., There is a need to reinvigorate focus on how to realise the BIG picture. This includes achieving 50% domestic market share and leapfrogging into the larger orbit of becoming a significant global player - from world's seventh to the third largest machine tool market and from thirteenth to the fifth machine tool producing nation. To facilitate this, 14th Vision Conclave in Mahabalipuram was successfully organised in November 2014 which was spearheaded by 'UDAAN' team. A large number of 'UDAAN' members including several first-timers attended the event and deliberated



on actions needed to achieve the Vision. I feel that the thrust is on the industry to take benefit of such initiatives by the Association.

I would like to share that IMTMA brought out some key publications for the benefit of the industry. These include the ACMA-IMTMA Joint Study: Enabling Indian Auto Component Industry Competitiveness', IMTMA 'Productivity Digest - a compilation of award winning case studies from the Productivity Summits held from 2010-2014', a book on 'Eleven Mega Platforms of Modinomics' (Impact on India's Manufacturing Sector) - compilation of fact sheets on the mega projects of the new Government in order to bring out opportunities available for manufacturing technology sector in India and also a web based electronic catalogue of Guide to Indian Machine Tools.

Association will initiate activities that are key from time to time so that we meet the aspiration of membership and stakeholders.

BIEC

Bangalore International Exhibition Centre (BIEC) has become a destination of choice for many organisers within India and abroad. Apart from the IMTMA's flagshipevent IMTEX and Tooltech, BIEC hosted around 30 national and international shows, during the financial year 2014-15. For the first time, Hon'ble President of India Mr. Pranab Mukherjee visited BIEC to inaugurate 'Mobile One', an initiative of the Government of Karnataka. BIEC is now an active member of national and international exhibition and trade associations such as UFI, IAEE, AFECA, IEIA, and IACC and is part of many initiatives in the international exhibition arena.

We will continuously invest to build capacity and upgrade facilities to stay ahead of other venues in the country.

Future Thrust

The primary objective of India's machine tool industry is to create advanced indigenous machine tool technology capability and build world-class machines at competitive prices. This involves technology transfer. Indian companies have entered into technical collaborations and joint ventures to upgrade technology. This would enhance the competitiveness of India's machine tool industry.

Nevertheless some immediate and short term measures are required to support the industry which include reduction of customs duty to zero per cent on all critical elements, reduction of excise duty on machine tools, reimbursement of excise duty to small scale manufacturers, allow higher rate of depreciation on Indian machine tools, treat machine tools as "priority sector" for financing and reducing the interest rates of borrowing. IMTMA, as always, is committed to support the industry and making efforts and hoping for a positive impact and response from the Government.

We will continue to project machine tool Industry as a key enabler of "MAKE IN INDIA" initiative.

Adieu

The last two years, for me as the President of IMTMA, have been indeed most rewarding. It has been a great learning experience for me personally. I share the steady achievements and accomplishments of the Association, which has been made possible by my colleagues in the IMTMA Executive Committee. It was equally gratifying to have the guidance of all the Past Presidents of the Association. My special thanks to IMTMA Secretariat ably led by Mr. V. Anbu – Director General and the entire team for their unstinted support all the time. As I lay down the office of President at the forthcoming Annual General Meeting, I commit my whole-hearted support to my successor and to the new Executive Committee, for successfully strategizing for a brighter future for our industry in the years ahead.

L. Krishnan President

68th ANNUAL GENERAL MEETING OF IMTMA

30 September 2014 : Oberoi Hotel, Mumbai



68th Annual General Meeting of the Indian Machine Tool Manufacturers' Association (IMTMA) was held on 30 September 2014 at Oberoi Hotel in Mumbai. IMTMA had organised the 'Meeting of Members' on 25 September 2014 in Bangalore, prior to the Annual General Meeting.

Delivering his annual address, IMTMA President, Mr. L. Krishnan briefly spoke about the positive signs emerging in the Indian economy and the new government's impetus to 'manufacturing' through the launch of 'Make in India'. While acknowledging the supportive role of the Government of India, particularly the Department of Heavy Industry in supporting the Capital Goods Industry in India, Mr. Krishnan informed the gathering that the Government of India's Cabinet Committee on Economic Affairs has approved the "Scheme for Enhancement of Competitiveness of the Capital Goods Sector" with emphasis on machine tools sector.

Speaking about the key initiatives of IMTMA, he spoke about the new Technology

Centre established at Pune for members and user industries in the western region of India. Mr. Krishnan then spoke about the Association's Business Excellence initiative. He said that IMTMA has been engaged in developing the vision for India's machine tool industry for the next decade. Mr. Krishnan re-emphasized IMTMA's commitment to help Indian companies take next steps towards growth and development.

For this, the Association rolled out its Business Excellence Programme and developed a roadmap for the Indian Machine Tool Industry which would help small, medium and large machine tool companies to be competitive and attain higher levels of performance and productivity, match domestic and global benchmarks and emerge as lean, competitive business units to take on the competition in a larger arena. To enable this, IMTMA conducted roadshows in Rajkot, Pune, Ludhiana, Delhi, Chennai and Bangalore.



Mr. Krishnan called upon the membership and industry to participate and benefit from the Business Excellence project. He then touched upon IMTMA's upcoming initiatives, the 14th Vision Conclave for CEOs and "UDAAN" members, and the Regional Machine Tool Expos in Delhi and Ahmedabad.

Going forward, Mr. Krishnan informed the gathering that "IMTMA-Naoroji Pirojsha Godrej International Exhibition and Conference Complex" has gained its rightful recognition as a state-of-the-art venue for organizing industrial trade fairs and international-level conventions and conferences. He then thanked the membership, Past Presidents, Executive Committee and Secretariat for providing assistance, guidance and support in all major endeavours of the Association.

Mr. Krishnan then took up the statutory agenda and the special business of the Association which was unanimously approved by a voice vote. The Annual General Meeting of IMTMA concluded with a vote of thanks to the office-bearers of the Association.





ANNUAL REPORT 2014-2015

JULY 2	2014
7	: Finishing School in Production Engineering (4 weeks) - Bangalore
11	: VFD Technology for Industrial Automation and Energy Saving - Bangalore
14-16	: Sheet Metal Dies – Tryout & Proving - Pune
15-16	: Strategies for Successful Design and Processing of Plastic Parts - Bangalore
17	: Burr Management in Machining - Bangalore
22-23	: Welding Technology in Automobile, White Goods and Consumer Durable Industry-Pune
23-24	: Failure Mode and Effects Analysis - Gurgaon
24-25	: Condition Monitoring of Industrial Machines - Bangalore
25-26	: Practical Solutions for Designing Complex Plastic Injection Moulds - Pune

AUGUST 2014

12-13	: Design for Manufacturing and Assembly - Bangalore
12-13	: Improving Process Capability - Pune
18	: Machine Tool Design - Professional - (10 Weeks) - Bangalore
18-22	: Operation of Co-ordinate Measuring Machines - Bangalore
21-22	: Design of Workholding & Fixturing - Rudrapur
21-22	$: \ Defects \ Analysis \ of \ Paint \ \& \ Powder \ Coating \ Applications \ - \ Bangalore$
22	: SMED in the Press Shop - Pune
22-23	: Advanced Metal Forming Processes - Gurgaon
25-27	: Sheet Metal Die Maintenance - Tryout and Proving - Pune
26	: Effective Design & Maintenance of PDC Dies - Chennai
27	: Sheet Metal Die Maintenance - Chennai

SEPTEMBER 201412-13: Heat Treatment Process in 'Metalworking' - Bangalore13: Design of Hydraulic System for Machine Tools - Bangalore16-17: Better Utilization of CNC Turning and Machining Centers - Pune16-17: Failure Mode & Effects Analysis - Bangalore18-19: Challenges and Solutions in Machining Aerospace Materials - Bangalore18-20: Effective Maintenance of CNC Machines for Productivity
Improvement - Bangalore23-24: Value Analysis and Value Engineering - Bangalore25-26: Trouble Shooting Component Defects in a Press Shop - Pune27: Selection of LM Guide Way and Ball Screw for Machine Tools - Bangalore29-30: Sheet Metal Dies - Tryout and Proving - Pune



осто	3ER 2014
10	: CNC Machine Selection, Testing & Acceptance - Pune
14	: Measuring Productivity through OEE - Pune
16	: Sheet Metal Die Maintenance - Gurgaon
17	: Effective Design and Maintenance of PDC Dies - Gurgaon
17-18	: Basics of Gear Manufacturing Process - Pune
28-30	: Advanced Programming for CNC Machining centres - Bangalore
30-31	: $Defects$ Analysis of $Paint$ & $Powder$ Coating Applications - $Gurgaon$
30 - 31	: Geometric Dimensioning and Tolerancing (GD&T) in Design through Manufacturing - Pune

NOVE	MBER 2014
3-29	: Finishing School completes 19 Batches - On to 20th - Bangalore
4-5	: Spindle Maintenance for Metal Cutting & Industrial Machinery - Pune
14	: Cleaning of Machined Components - Bangalore
18 - 19	: Defect Analysis & Trouble Shooting of Injection Moulded Components - Bangalore
20-21	: Cold Forging / Cold Extrusion Technology - Bangalore
22	: Selection, Assembly and Trouble Shooting of Linear Motion Guide Ways and Ball Screws for Industrial Machinery - Gurgaon
24	: Machine Tool Design - Rapid (6 weeks) - Bangalore
25 - 26	: TOPS-8D-Structured method of problem solving for engineering industries - Pune
27	: Selection of LM Guide Way and Ball Screw for Machine Tools - Bangalore
27-28	: Advanced Concepts of GD&T - Bangalore
27-28	: Automation Project Implementation - Gurgaon

DECE	4BER 2014
3-5	: Hands-on Training in Dimensional Metrology - Bangalore
9-10	: Design of Pressure Die Casting Dies - Bangalore
11	: Design of Hydraulic System for Machine Tools - Bangalore
11-12	: Heat Treatment Process in Metal Working - Delhi
12	: Burr Management in Machining - Pune
15-17	: Robots Operation and Programming - Bangalore
16-17	: Injection Molding Process Development via Scientific Principles - Pune
22-23	: Tolerance Stack-up Analysis - Bangalore
24	: Selection of LM Guide Way and Ball Screw for Machine Tools - Bangalore

JANUA	NRY 2015
6-7	: Defects Analysis of Paint & Powder Coating Applications - Pune
7-8	: Design of Gauges - Bangalore
9	: Sheet Metal Die Maintenance - Pune
9-10	: Latest Trends in Laser Plasma & Water Jet Cutting - Bangalore
13	: VFD Technology for Industrial Automation and Energy Saving - Bangalore
13	: Inspection of Sheet Metal Formed Components - Pune
16-17	: Cold Forging / Cold Extrusion Technology - Gurgaon
21	: International Seminar on Machining Technologies
22-28	: IMTEX 2015 and Tooltech 2015
FEBRU	JARY 2015
10-11	: Maintenance and Troubleshooting of Presses - Pune
11 - 12	: Geometric Dimensioning and Tolerancing (GD&T) in Design through Manufacturing - Gurgaon
12-13	: Design for Target Cost - Bangalore
16-26	: Design of Fixture - Specialization - Bangalore
18	: Cutting Fluids Management - Bangalore
19	: EMC Requirements and CE Certification for Export of Machine Tools - Bangalore
19-20	: Design of Workholding & Fixturing - Pune
19-20	: Metallurgy for Designers of Industrial Machinery - Bangalore
23 - 25	: Effective Maintenance of CNC Machines for Productivity Improvement - Pune
24-25	: Better Utilization of CNC Turning and Machining Centres - Bangalore
26-27	: Burr Management in Machining - Bangalore
26-27	: Latest Trends in Die & Mould Manufacturing - Pune
MARC	H 2015
12-13	: Workholding and Fixturing Clinic for Production Engineers - Bangalore
	2015

APRIL	2015
6	: Machine Tool Design – Mechanical (8 weeks) - Bangalore
7 - 8	: Design of Experiments - An Approach to Robust Product & Process Quality with Real Life Examples - Pune
8	: Measuring Productivity through OEE - Bangalore
10	: Modern Automotive Needs and Latest Trends in Forging Technology - Pune
15-16	: Design for Manufacturing and Assembly - Pune
15 - 17	: Advanced CNC Programming for CNC Machining Centres with Siemens Controller - Bangalore
17	: Performance Improvement in Foundries - Pune
17	: Calibration of CNC Machine Tools - Bangalore
20	: Finishing School in Production Engineering (4 weeks) - Bangalore
22	: Cleaning of Machined Components - Gurgaon
21-23	: Gear Manufacturing Processes - Bangalore
27 - 29	: Geometric Dimensioning & Tolerancing in Design through Manufacturing (GDTP Technologist Level - ASME) - Pune
28	· Design of Hydraulic System for Machine Tools - Bangalore



MAY 2015

6-7	:	Reducing Cycle Time and Machining Cost on CNC Machining Centres - Pune
8	:	Excellence in Capital Goods Marketing - Pune
8 - 9	:	Visual Factory / Visual Management: Paving Way for Lean, TQM & TPM
		Implementation - Pune
9	:	Selection of LM Guide Way and Ball Screw for Machine Tools - Bangalore
12	:	Surface Finish & Its Measurement - Bangalore
15 - 16	:	Calibration of Dimensional Measuring Instruments & Evaluation of Uncertainty - Pune
18 - 20	:	Trouble Shooting Component Defects in a Press Shop - Pune
21 - 22	:	Metallurgy for Designers for Industrial Machinery - Gurgaon
22	:	Adaptive Control for optimising CNC machining - Bangalore
25 - 29	:	Basics of Programming and Operation of CNC Machining Centres - Bangalore
26 - 27	:	Cold Forging / Cold Extrusion Technology - Pune
27 - 29	:	Maintenance and Trouble Shooting of Industrial Hydraulic systems - Bangalore
28 – 29	:	Design of Workholding & Fixturing - Bangalore

JUNE 2015

4-5	: Better utilization of CNC Machines - Bangalore
9-10	: FEA/FEM-Pune
11-12	: GD&T-Bangalore
12	: Hydroforming and its Applications - Pune
12-13	: Defects & Analysis of painting and coating applications - Bangalore
15-25	: Design of Fixture – Specialization - Bangalore
16-17	: Tolerance Stack-Up Analysis - Pune
19-20	: Additive manufacturing Technologies - Bangalore
23-24	: How to Improve accuracy of Machine Tool
25-26	: Advance GD&T - Gurgaon
26-27	: Spindle Maintenance for Metal Cutting & Industrial Machinery - Bangalore



ANNUAL REPORT 2014-2015

IMTEX 2015 & TOOLTECH 2015



International participation



17th International Exhibition of Cutting Tools, Tooling Systems, Machine Tool Accessories, Metrology & CAD / CAM

22-28 January 2015: BIEC, Bangalore



The 17th edition of South East Asia's largest exhibition 'IMTEX 2015 and Tooltech 2015' organized by the Indian Machine Tool Manufacturers' Association (IMTMA) at Bangalore International Exhibition Centre was held from 22-28 January 2015 at BIEC, Bangalore. IMTEX 2015, the international show on metal cutting showcased new technologies, facilitated joint ventures and enhanced business interactions. True to its grandeur, the best manufacturing solutions from across the globe and potential future metal cutting technologies were on display making the event an enabler of Make in India.

Manufacturing showed a positive growth in the second half of 2014. The industry was growing and the trend is expected to continue in 2015. The ambitious project on 'Make in India' has enabled the growth of the manufacturing industry sector leading to an increase in the production and consumption of machine tools and an overall improvement in the macroeconomic conditions. IMTEX 2015 was organized amidst these neo-positive sentiments across industries which lifted the event to be one of the best shows raising the bar on all fronts.



IMTEX 2015 and Tooltech 2015 was attended by about 90,000 visitors from 62 countries including India). A total of 1032 exhibitors from 24 countries displayed their products in a net exhibit space of 48,000 sq.mts. gross. The exhibition had group participation from eight countries — China, Czech Republic, Germany, Italy, Japan, Spain, Taiwan and USA.

Many trade delegations took part in the exhibition. Ministry of Defence, Ordnance Factory Board, COFMOW (Railways), Bharat Heavy Electricals Limited, Defence Metallurgical Research Laboratory, National Aerospace Laboratories, Integral Coach Factory, Indian Space Research Organisation Satellite Centre, and Laghu Udyog Bharti were prominent public sector units that attended. Joint Ventures like International Aerospace Manufacturing and Brahmos Aerospace also attended. National associations like Tractor Manufacturers' Association, Automotive **Component Manufacturers Association** and Vidarbha Industries Association, and international delegations like 600 UK (United Kingdom), Cerathai Co. (Thailand), Global Excel Tools Manufacturing (Malaysia), and EGE Teknikcnc Makina Dis





Ticaret Kollektif Sirketi (Turkey) also participated in the exhibition. Many other major companies also attended IMTEX 2015. These include ABB Limited, AL Cold Forge, Aruna Alloy Steels, Automotive Valves, Bharat Forge, Brakes India, Cummins, Dover India, Emerson, Featherlite, Force Motors, Gujarat Forgings, Hitech Gears, IFB Automation, India Pistons, JREW Engineering, K-Square, Lucas TVS, Mahindra & Mahindra, Meneta Automotive Components, Metrostaff, Seinumero, Tata Motors, Toyota Kirloskar Motor, and VST Tillers (*List Illustrative*).

Overall a wide spectrum of manufacturing industries participated in the exhibition. Enquiries worth Rs. 15960 crores were generated and orders worth Rs.1434 crores were booked.

The exhibition was inaugurated on 22 January 2015 by Mr. G.M. Siddeshwara, Minister of State for Heavy Industries & Public Enterprises, Govt. of India, Mr. R.V. Deshpande, Minister for Higher Education and Tourism, Govt. of Karnataka, Ms. K. Ratna Prabha, IAS, Addl. Chief Secretary, Commerce & Industries Dept., Govt. of Karnataka, Mr. Vishvajit Sahay, Joint Secretary, Department of Heavy Industry, Ministry of Heavy Industries & Public Enterprises, Govt. of India, Mr. Debasish Mallick, Deputy Managing Director, EXIM Bank of India, Mr. Tarun Das, Former Chief Mentor, Confederation of Indian Industry & Founding Trustee, Ananta Aspen Centre and Mr. Ajay Shankar, Former Member Secretary, NMCC, Mr. Jamshyd N. Godrej, Chairman -Exhibitions, IMTMA, Mr. L. Krishnan, President - IMTMA and Mr. P.G. Jadeja, Vice President-IMTMA were also present.





Award

At IMTEX 2015, the 6th 'IMTMA -**Premier Outstanding Entrepreneur** Award' was bestowed on Dr. Arvind Patel, Founder Director, Sahajanand Laser Technology Ltd., for his outstanding entrepreneurship in machine tools. An engineer in Electronics and Biomedical Instrumentation from Gujarat University, he was recognized for his visionary pursuit of entrepreneurial excellence. The award has been instituted in memory of Mr. Vinod Doshi, an outstanding industrialist and one of the founding fathers of IMTMA.





Media Coverage

- IMTEX 2015 to Mirror India's Growth (Modern Manufacturing India; 15November2014).
- A Curtain Raiser on IMTEX 2015 (Modern Manufacturing India; 15November2014).
- IMTEX 2015 17th Indian Metalcutting Machine Tool Exhibition (TimeOut Bangalore; 22 January 2015).
- IMTEX 2015 (The Dollar Business; 22 January 2015).
- 'Make rich dividends by investing in Karnataka' (Deccan Herald; 23 January 2015).
- Featuring innovations in metal cutting space (Efficient Manufacturing; Vol. 6, January 2015).
- IMTEX 2015 will mirror India's manufacturing growth (Efficient Manufacturing; Vol.6, January 2015).
- The IMTEX Factor (Manufacturing Today; Vol. 5; Issue 1; January 2015).
- Impressive IMTEX, Tantalising Tooltech (Auto Components India; Vol. 1, Issue 11; January 2015).
- Enabling Make in India: Giving Claws to India's Manufacturing (Economic Times; 21 January 2015).
- "Let's move out of the subsidy scheme" (Efficient Manufacturing; Vol.6, January 2015).
- 'Make-in-India' echoes blissfully at IMTEX 2015 (MFG Tech Update; 22 January 2015).



- IMTMA presents India's largest biennial exhibition - IMTEX 2015 and Tooltech 2015 (The Bangalore Times; 22 January 2015).
- Machine Tool manufacturers urge bankers to lend aggressively (Umesh M Avvannavar; Deccan Herald; 26 January 2015).

Mr. L. Krishnan, President, IMTMA said that IMTEX is known to be one of the biggest events that cater to the manufacturing sector. The event has the ability to galvanize and motivate the entire manufacturing industry. Even at the time of recession, IMTEX helped industry leaders to connect with customers. With current improved sentiments, IMTEX would spur investment and modernization of the manufacturing industry in India.

IMTEX as an event has consistently showcased numerous technologies and machines to industry players. The solutions displayed at the 17th 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.



Trends displayed by Indian exhibitors: With the 'Make in India' initiative providing a boost to the Indian manufacturing sector many new technologies such as multispindle 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 were offered. Vision based re-engineering systems were also popular. Indigenous developments in testing equipment were evident from the display of hydraulic servo exciters and spindle testing, gear testing, air leak detector and testing machines.

Trends displayed by foreign 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. Multinational companies also exhibited multi-tasking in a single machine. This is futuristic technology.

Discussing the show, Mr. Junya Tashior, Director General, JETRO said, "Indians are becoming conscious about durable quality and are ready to spend money for the same. Due to this Japanese companies are looking at the Indian market with a positive attitude. With FDI being allowed in many key sectors, we can see more and more Japanese companies entering the Indian market." All these delegations had come to IMTEX with a clear agenda of attracting investments from Indian companies for their country. Expressing his views about the show, Mr. L. Mohanty, Deputy Director General, Ordnance Factory Board shared, "The Indian machine tool industry is growing and we are looking for effective solutions. IMTEX shows the capability of Indian machine tool builders; and seeing more solutions that can substitute imports is encouraging.



Academia Pavilion

A total of 25 institutions showcased their innovative research projects related to metal working at the Academia Pavilion at IMTEX 2015 from across India. NMAM Institute of Technology, Udupi was awarded the first prize for their display. Chennai Institute of Technology, Chennai got the second prize and Amrita Vishwa Vidyapeetham, Kollam won the third prize. Consolation prizes were awarded to IIT, Delhi and IIT, Madras respectively.

In order to orient young engineering students with emerging technological capabilities, especially in industrial technologies, and getting them acquainted with the actual manufacturing shop floor set-up through a plant visit to prominent machine tool companies, IMTMA hosted the 7th **JAGRUTI – IMTMA Youth Programme.** This session was conducted from 23 to 25 January 2015 at IMTEX 2015 for a group of engineering students from across the country and about 24 students participated.





Two new initiatives were introduced during IMTEX 2015. 'Job Connect' was an awareness programme for fresh engineers visiting IMTEX. About 600 students from both mechanical and electrical engineering streams participated in the seminar. The seminar was divided in two orientation sessions - the 'CEO Connect' and the 'Industry Talk'. The 'CEO Connect' session had CEOs talking about the manufacturing industry, how machine tool technology helps in industry growth, and the role of an engineer in manufacturing industry, etc. The 'Industry Talk' had senior personnel from various companies making a presentation of their company, speaking about their recruitment process, the career growth in their companies and the available job profiles.



A unique **'Safe Driver Workshop'** was conducted at BIEC for educating drivers. Over 2000 to 3000 vehicles were seen in action every day during this IMTEX. BIEC felt the need of doing something for the drivers as part of its corporate social responsibility (CSR). BIEC along with the Bangalore Traffic Department and the Traffic Warden Association organised the Safe Driver workshop for a period of five days. The workshop was conducted by a team of experts from the Bangalore Traffic Warden Organisation. Six hundred drivers participated in the workshop.

The phenomenal success of IMTEX 2015 and Tooltech 2015 was made possible by the strong presence of business visitors and exhibitors making it a truly pan-global event and a grand success. IMTEX which exhibited innovative technologies for increasing productivity and optimizing resource utilization was a great enabler of the 'Make in India' initiative and will fuel the growth of indigenous manufacturing.





6th International Seminar on Machining Technologies 21 January 2015, Bangalore

Machine tools and its subsystems will continue to evolve with higher performance, enhanced safety standards, environmental compliance, with lower manufacturing costs. Machine tools of the future will provide increased performance capability and greater control of the m a n u f a ct u r i n g s y s t e m with multifunctional and multi-axis ability.

With a view to highlight the evolving trends in the machining technologies, Indian Machine Tool Manufacturers' Association (IMTMA) organized the sixth "International Seminar on Machining Technologies" on 21 January 2015, in conjunction with IMTEX 2015 exhibition, in Bangalore.

Sixth in the series, this International Seminar is today recognized as an international platform in India for global interactions on the latest trends in metal cutting. This seminar dwelt extensively on new manufacturing strategies, reviewed and addressed emerging trends, as well as exposed users and manufacturers to a range of value added machining solutions.

International experts from Germany, Israel, Sweden, United Kingdom, USA, and India facilitated sessions at this International Seminar. Spread over 2 keynotes and 5 concurrent sessions, the seminar covered key technology areas related to metal cutting machine tools and its sub-systems.

The seminar brought together individuals from varied segments of the Indian manufacturing industry such as automotive & auto components, tool rooms, aerospace, defence & railway establishments, pumps & valves, consumer durables, general engineering, machine tools and other capital goods industries. The seminar was well received by 312 delegates from 105 companies.



National Productivity Summit 2014 20 - 21 August 2014, Chennai

Indian Machine Tool Manufacturers' Association has been in the forefront of championing a productivity movement in Indian metal working industries by organizing the National Productivity Summit. This event showcases best productivity improvement projects in metal working industries through live case study presentations.

The National Productivity Summit 2014, eighth in the series was held from 20 - 21 August 2014 in Chennai. The event was well received by over 400 delegates from a wide spectrum of the manufacturing industry. The plant visits to Wabco India, Lucas TVS, Ford India and Rane TRW Steering provided a good opportunity to witness productivity improvements at these renowned companies.

The Summit had four inspiring keynote presentations and twelve live case study presentations from Ashok Leyland, Bajaj Auto, Bosch, Delphi TVS Diesel Systems, Hero MotoCorp, Lucas TVS, Mahindra & Mahindra, Mahindra & Mahindra (Automotive Sector), Maruti Suzuki India, Reliable Autotech, Tata Motors, and Wheels India.

The Summit crowned the winners of the IMTMA-Simens Productivity Championship Awards 2014 which gave away awards worth ₹10 lakhs.

MAJOR EVENTS AND ACTIVITIES



Vision 2020: 14th Conclave for CEOs & UDAAN members

13 - 16 November 2014, Mahabalipuram

India is stepping in to a new phase in manufacturing. It has benchmarked for itself a much higher growth than the current one over the next few years. There is a vision for manufacturing - of achieving 25% share in overall GDP by the year 2025 with concerted focus on technology and depth value addition, and to generate for the country a hundred million manufacturing jobs. There is a need to reinvigorate focus on how to realise the BIG picture. This include achieving 50% domestic market share and leapfrogging into the larger orbit of becoming a significant global player - from world's seventh to the third largest machine tool

market and from thirteenth to the fifth machine tool producing nation.

Keeping this in view, UDAAN team under the aegis of IMTMA organized the 14th Vision Conclave at Mahabalipuram from 13th to 16th November 2014 where it framed the 'Vision 2020'. The Vision envisages India to be among the top five machine tool building nations by 2020 by leveraging world class R&D, infrastructure, systems and people, delivering innovative solutions and services to create 'value for customers'. The 14th Conclave organized in Mahabalipuram saw a record attendance of 51 participants representing 24 organizations which is the highest ever. A large number of 'UDAAN' members including several first-timers attended the event.





MAJOR EVENTS AND ACTIVITIES

SPECIAL EVENTS

14th China International Machine Tool Show, Beijing



IMTMA organized a group participation of 5 Indian companies at China International Machine Tool Show (CIMT 2015) organized by China Machine Tool & Tool Builders' Association from 20 to 25 April 2015 in Beijing, Republic of China. About 1600 exhibitors from close to 30 countries participated in CIMT 2015. The show attracted a footfall of around 1,30,000 visitors.



Hannover Messe, Germany

IMTMA participated in Hannover Messe that took place from 12 to17 April 2015 in Hannover, Germany. Hannover Messe is the largest gathering of industrial technology companies and products, where more than 6500 exhibitors participated from about 70 countries. The exhibition showcased innovations and ground breaking solutions in all the core sectors including industrial automation and IT, energy and environmental technology, industrial supply, production engineering and services, as well as research and development. The fair witnessed more than 2 lakh visitors from all over the world.



The participation of India at the fair was supported by the Department of Commerce, Ministry of Commerce and Industry, Govt. of India, Ministry of External Affairs, Govt. of India, Embassy of India, Berlin, Germany, EEPC India, CII and FICCI.

ACTIVITIES OF IMTMA REGIONAL COUNCILS

IMTMA Regional Council (North) Meeting on 9 September 2014: Ghaziabad



An interactive meeting of IMTMA Regional Council (North) was held at Hotel Clarks Inn Suites in Ghaziabad. Members discussed 'Business Excellence' followed by a plant visit to Abilities India Pistons & Rings Limited, Ghaziabad.



Meeting on 14 March 2015: Pantnagar



Regional Council (North) of IMTMA held a meeting at Ashok Leyland in Pantnagar followed by a plant visit to Ashok Leyland.

MAJOR EVENTS AND ACTIVITIES



IMTMA Regional Council (West)

Meeting on 24 December 2014: Pune

Regional Council (West) of IMTMA held a meeting at IMTMA office in Pune. Members discussed Vision 2020, Pune Technology Centre and IMTEX.





Meeting on 10 June 2015: Pune

Regional Council (West) of IMTMA held a meeting at IMTMA office in Pune. Members discussed AMTTF, revised Business Excellence programme, Funding for Technology Development and Technology Acquisition under DHI Scheme, and the regional machine tool expos at Delhi and Ahmedabad.

IMTMA Regional Council (South) Meeting on 22 July 2014: Bangalore



The meeting of IMTMA Regional Council (South) was held at Ace Designers. Prior to the meeting members visited Ace Designers' painting division and observed best practices being followed.

Meeting on 30 October 2014: Hosur

Meeting of IMTMA Regional Council (South) was held at TVS Motor Company in Hosur. Prior to the meeting, senior officials of TVS Motor Company took RC(S) members to their Plant II which has machining shop and assembly line. Members expressed their readiness to build machines and requested TVS to give specific requirements at the initial stage of design.

Meeting on 26 February 2015: Bangalore Meeting of the IMTMA Regional Council (South) was held at ITC Ltd., Bangalore. Prior to the Regional Council Meeting, a visit to the facilities of ITC Ltd.'s (Primary & Secondary Manufacturing Department) was organised. ITC officials made a presentation which showcased best practices followed by them.



Meeting on 26 May 2015: Bangalore

A meeting of IMTMA Regional Council (South) was held at Kennametal India Limited., Bangalore. Prior to the commencement of the Regional Council meeting, members were guided to visit to Machine Tool & Cutting Tool Division facilities at Kennametal India Limited. The Compendium of Industrial Painting & Coating Processes for Machine Tools which provides complete information and acts as a reference material for the machine tool industry was released.



MAJOR EVENTS AND ACTIVITIES BUSINESS EXCELLENCE

IMTMA has been engaged in developing the Vision for the Indian machine tool industry for the next decade. The association is also focusing on helping Indian companies take next steps towards growth and development. IMTMA has rolled out its Business Excellence Programme to help member companies attain higher levels of performance and productivity, match domestic and global benchmarks and emerge as lean, competitive business units to take on the competition on a larger arena. IMTMA conducted introductory roadshows in various machine tool hubs such as Rajkot, Pune, Ludhiana, Delhi, Chennai and Bangalore to take this programme to the doorstep of the Industries. These roadshows were attended by top management and senior executives of companies. Through various interactive sessions conducted during the roadshow, stakeholders were able to arrive at a snapshot of their unit through several tools. As a result, a path has been envisaged for their future development.

Excellence Framework for IMTMA



Learning, Creativity and Innovation

Finishing School in Production Engineering

- 7 July 2 August 2014, Bangalore
- 4 September 1 October 2014, Bangalore
- 3 29 November 2014, Bangalore
- 16 February 14 March 2015, Bangalore
- 20 April 15 May 2015, Bangalore



The Indian manufacturing sector has become a major destination for global players not only for manufacturing activities but also for marketing their latest developments especially in the field of CNC technologies. Systematic training in best manufacturing practices is highly crucial and well trained manpower can bring in significant improvement in productivity and quality levels for increased profitability. IMTMA organized an exclusive hands-on course to enhance the skill sets of engineers and supervisors from manufacturing industries.

The course provided participants hands-on experience in production CNC machines, CAD/CAM, metrology equipment, tooling and workholding systems and other accessories. New recruits from Kennametal India, Wipro Engineering, Ceratizit India, and many more have underwent this course and got well prepared to serve the industry.

Strategies for Successful Design and Processing of Plastic Parts

15-16 July 2014, Bangalore



We are said to be living in an era of plastics since 1974, as the world consumption of plastics from that year onwards exceeded that of steel. From household appliances to airplanes, tooth brushes to telephones, and computers to cars, everything seems to be made out of plastics. Injection molded plastic parts offer unbeatable combination of light weight construction, flexibility, toughness, chemical resistance, long-term performance and cost effectiveness. World class injection moldings are a result of knowledge of plastics, excellent part design, robust mold design, methodical mold manufacture, optimum process parameters and reliable molding machine. IMTMA organized a seminar that gave an overview of plastic materials, properties and applications.

VFD Technology for Industrial Automation and Energy Saving

- 11 July 2014, Pune
- 13 January 2015, Bangalore



Speed Control of 3 Phase Induction Motors by using Variable Frequency Drive (VFD) is a widely used technology in various industrial applications. With advances in VFD Technology new application possibilities are opening up.

With energy bills rising rapidly, new developments in VFD technology enables significant cost savings. Industrial Automation is moving towards Intelligent Automation and VFD has a key role to play in this. IMTMA organized seminars in Pune and Bangalore to give a wide overview of the technology, starting from fundamentals, and going up to latest developments and threw light on energy saving through use of 'VFD'.





ANNUAL REPORT 2014-2015



Burr Management in Machining

- 17 July 2014, Bangalore
- 12 December 2014, Pune
- 26-27 February 2015, Bangalore
- 24 September 2014, Gurgaon

As long as there has been metal cutting, there have been burrs - an unwanted side effect of the process. Barring a revolutionary change, burr formation will always be a problem. With a few exceptions, conventional machining techniques always produce burrs. Burr prevention requires both conventional and non-conventional approaches. However, even when burrs are not produced, sharp edges left as a result of the machining process generally are not acceptable and require edge treatment. Burr removal represents unnecessary cost to the industry in various forms such as additional manufacturing, compensation, service, recall, and collateral damage on the company image.

Therefore, in most cases, it is a must, either to remove or to secure the burr in order to prevent it from being detached from the part.

IMTMA organised a one day programme to give a clear knowledge to participants on burr definition, burr geometry, burr formation mechanisms, burr types and standards for burrs and edges.



Sheet Metal Dies - Tryout & Proving

- 14 16 July 2014, Pune
- 25 27 August 2014, Pune
- 29 September 1 October 2014, Pune

IMTMA organizes a number of programmes for the benefit of metal working industries. Sheet Metal Dies - Tryout and Proving was the first formal metal forming hands on training programme organized by Pune Tech Centre. This programme was aimed at providing in depth knowledge about activities to be done for tryout, carrying out static and dynamic checks and methods of overcoming defects. The presentations were supported with practical demonstration of all the relevant points in a tool room manufacturing dies and in a Press Shop.



Welding Technology in Automobile, White Goods and Consumer Durable Industry

22 - 23 July 2014, Pune

The quality needs of various welded sheet metal and other components are vital for producers to reach the A-class level of competence and consistency. There is a shift to the use of coated, micro-alloyed and

HSLA steels, aluminium alloy sheets, in a utomobile and white goods manufacturing sector. The modern fast and automated manufacturing technology required in these mass-manufacturing industries, involves welding processes. Simultaneously welding distortion and welding defects are major issues that every welding engineer face today.

It is necessary for manufacturers to be apprised of the latest techniques of welding and the quality needs to meet the expectations of users. IMTMA organized a two day workshop to help practicing engineers to develop full technical understanding of the subject and equip them with thinking tools to gather and analyse right data for solving day-to-day manufacturing issues related to welding processes.



Failure Mode and Effects Analysis

- 23-24 July 2014, Gurgaon
- 16-17 September 2014, Bangalore

Failure Mode & Effects Analysis (FMEA) is an essential ingredient of reliability engineering and is a very powerful and effective technique used for improvement in design, assembly, materials engineering, and servicing in a diverse range of manufacturing activities.

FMEA is an "error prevention" oriented and proactive methodology that tries to preempt the occurrence of errors; reduce their significance (even if they were bound to occur) and in unavoidable circumstances to increase the chance of error detection so that the process could then be suitably controlled. Whenever changes in product or processes or vendors and suppliers are envisaged or effected, FMEA is redone to evaluate their effects. IMTMA organized two day workshops in Gurgaon and Bangalore to train participants on the concept of FMEA as a risk management and preventive quality assurance technique.



Improving Process Capability

12 - 13 August 2014, Pune

Control Charts and SPC techniques are used by quality and process engineers in the industry for many years for process control and calculating process capability. Often this topic is taught and learnt from the standpoint of a statistician or just as a metric. Engineers fail to understand the reasons and the impact of the process variation on the product in a real life scenario particularly because data collection and calculation of performance has been simplified and automated today. Many engineers have missed on development of an insight and ability to interpret the numerous data around. Software is used but the assumptions not understood. IMTMA organized a two day advanced programme for practicing engineers who are already aware and are using control charts and calculating CP/CPK.







Hands-on Training in Operation of Co-ordinate Measuring Machines

18-22 August 2014, Bangalore

In the modern manufacturing environment, process control and quality assurance depend increasingly on the performance of Co-ordinate Measuring Machines (CMMs). Today CMMs have replaced traditional methods of inspection with guages and fixtures thus reducing the time and manpower required in quality control operations.

Rapid growth of CMM population all over India has generated enormous demand for trained engineers for successful and meaningful handling of inspection challenges. This can be achieved only if the CMM engineer possesses basic engineering knowledge, inspection skills and has a logical and analytical approach to fulfil the task. IMTMA taught a comprehensive course that covered in detail all the aspects a practicing CMM engineer needs to know for effective use of CMM for reliable measurement results.



Defects Analysis of Paint & Powder Coating Applications

- 21-22 August 2014, Bangalore
- 30-31 October 2014, Gurgaon
- 6-7 January 2015, Pune
- 24 25 April 2015, Gurgaon
- 12 13 June 2015, Bangalore

In today's manufacturing scenario, where shortage of raw material, power and increasing pressure to reduce costs are the order of the day, 'painting and coating application' is possibly the most troubled issue. Lack of knowledge in defect analysis especially in painting and powder coating and buck passing between paint and powder suppliers versus equipment suppliers lead to high rework and rejection rates. IMTMA organized a two-day programme to give participants a stronger ability to in-depth Root Cause Analysis of the recurring defects and make them understand the correct process sequence and the SOPs involved.



Design of Workholding & Fixturing

- 21-22 August 2014, Rudrapur
- 19-20 February 2015, Pune
- 28-29 May 2015, Bangalore

Design of workholding and fixturing is the key to effective utilization of machine tools. Basics of fixture design if not implemented correctly results in poor productivity and quality problems. Set-up time and cycle time reduction, increased accuracy on components, de-skilling the job setting

operation are the obvious advantages of a good fixture. Competence in workholding and fixturing differentiates excellent organizations. IMTMA organized a two day seminar to expose the participants to various types of workholding fixtures.



SMED in the Press Shop

22 August 2014, Pune

Single-Minute Exchange of Die (SMED) is one of the many lean production methods for reducing waste in a manufacturing process. It provides a rapid and efficient way of converting a manufacturing process from running the current component to running the next component.

This rapid changeover is the key to reducing production lot sizes and improving flow. For SMED to be successful it is important that personnel in the press shop fully understand the methodology and benefits. Training plays a very important role in accomplishing this. IMTMA organized a one day programme covering the basic SMED concepts, SMED concepts as applied to press shops, introduction to latest SMED equipment available, and case study of actual SMED implementation in a press shop.

Advanced Sheet Metal Forming Processes

22-23 August 2014, Gurgaon

The multiple facets of modern sheet metal forming techniques are applied throughout a wide spectrum of economy, ranging from the automotive industry and machine manufacturing to electrical engineering and electronics. As compared to conventional manufacturing, advanced sheet metal forming offers several advantages. The automotive industry is the main impetus worldwide for new developments as is seen in its efforts to optimise lightweight constructions coupled with high strength. Nowadays, Simulation / CAE Tools are increasingly used to develop the product and process, replacing lengthy trial and error processes on real prototypes. IMTMA and Sheet Metal Forming Research Association organized a two day course introducing advanced and future technologies that are available and are being developed in the area of sheet metal forming.



Effective Design & Maintenance of PDC Dies

- 26 August 2014, Chennai
- 17 October 2014, Gurgaon

High pressure die casting is often the process of choice because of its cost effectiveness and superior quality. Aluminium die cast components have the property of being very light weight with significant mechanical properties and is used extensively in the automotive industry. In order to get the best results, it is very important to design the component and the die with a thorough understanding of the Die Casting process.

IMTMA conducted a one day seminar that focused on a critical study of the component design from the tooling and process perspective, design process of the PDC dies, solutions to common challenges



faced in designing the dies, selection of the right die steels and their heat treatment, tips on better assembly and tryout methodology, effective maintenance of the dies, and impact of use of coatings on the life of the die.



Sheet Metal Die Maintenance

- 27 August 2014, Chennai
- 16 October 2014, Gurgaon
- 9 January 2015, Pune
- 3 June 2015, Pune

Companies continue to struggle to maintain, manage and control sheet metal stamping operations in a manufacturing environment but proven strategies and procedures can turn things around. Sheet Metal Tooling must receive the same treatment as presses.

Any PM process that centres on tooling must, by nature, provide for the uniqueness of the tool while considering the common wearable elements shared by many such tools. The impacts of sudden die breakdowns are extremely unpleasant and result in big monetary losses and other negative consequences. IMTMA organised a one day seminar to make participants understand the methodology of carrying out proper die maintenance, prevent sudden die breakdowns and analyse and predict wear and tear in common die elements.



Design of Gauges

- 27 28 August 2014, Gurgaon
- 7-8 January 2015, Bangalore

When a part is manufactured, it must be measured to ascertain that it is of the right dimensions for fulfilling the purpose for which it is intended. Gauges are one of the commonly used inspection tools in production shops for quick checking and validation of the dimensions of manufactured parts.

Thus, gauging has become an integral part of any machining process and gauges help in ensuring required degree of interchangeability among the millions of parts manufactured worldwide. The type and the design of gauges depend on the application, volume of production and precision levels required. Design of gauges is of prime importance because, if the gauge is designed incorrectly, it will be built but never get used. IMTMA conducted a twoday programme to give delegates an overview of attributable gauging system, types of 'gauges', and 'gauge' design criteria.

Heat Treatment Process in 'Metalworking'

- 12-13 September 2014, Bangalore
- 11-12 December 2014, Gurgaon
- 17 18 March 2015, Pune

Heat treatment is a core manufacturing process carried out under controlled application of temperature and atmosphere to optimize certain physical



and mechanical properties of metals and alloys.

The process of heat treatment has a major bearing on the quality of the end product and finds a wide application in many industries such as automobile and auto components, dies and mould, machine tools, aerospace, and general engineering. IMTMA organized a two day seminar to make participants learn about various heat treatment methods and specific applications of each process, develop quality plan for critical heat treated components, and understand how to calculate and control case depth in surface hardening.



Better Utilization of CNC Turning and Machining Centres

- 17 18 July 2014, Gurgaon
- 16 17 September 2014, Pune
- 24 25 February 2015, Bangalore

One of the most sought after subject in recent time is Better Utilization of CNC Turning and Machining Centers. Most CNC machines are underutilized with only 20% time effectively spent in cutting and the rest in non-value adding operations. Entire CNC Machining needs to be looked as a holistic system / process, comprising machine tool, cutting tool, work holding, programming, inspection equipment and trained man power in order to improve productivity as well as quality. IMTMA organized a two day programme to help participants understand how to increase machine capacity and tool life, eliminate tool breakage, avoid accidents, and increase machine life.



Challenges and Solutions in Machining Aerospace Materials

18-19 September 2014, Bangalore

India is emerging as a preferred hub for aerospace manufacturing. However, machining of aerospace components is quiet challenging as it involves advanced materials like high performance metal alloys and composites. The machinability of these materials, complex shape coupled with stringent quality requirement makes the machining process highly demanding.

IMTMA organized a two day programme to help participants understand machining strategies for machining Ti alloys and other materials, select optimum cutting parameters for machining aerospace materials, understand types of composites and applications in aerospace industry, and adopt right machining methods for composites.



Effective Maintenance of CNC Machines for Productivity Improvement

- 18-20 September 2014, Bangalore
- 23-25 February 2015, Pune



To effectively maintain CNC machines, which are a costly resource in any company, requires a system approach. Maintenance engineers need to understand the complete interaction between the mechanical actuators and the electronic control.

They need to be 'Mechatronic' engineers with knowledge about mechanical sub systems and electrical / electronic circuits. IMTMA organized a three day programme at Bangalore and Pune to help participants gain cross-disciplinary knowledge to problem solving of maintenance issues, carry out preventive and break-down maintenance of CNC machines, and identify faults in various components of CNC machines.



Value Analysis and Value Engineering

23-24 September 2014, Bangalore

Value Analysis or Value Engineering is the foundation for success of any new product

being developed. It is becoming important in this competitive world to become faster, better and cheaper to survive and grow as an organization. In order to facilitate the achievement of the required quality and cost objectives for the manufacture of a product design solution, it is necessary to carry out Value Engineering at the earliest possible stage of design.

IMTMA organized a two day programme to help participants understand the difference between Value Analysis and Value Engineering, develop a Value Engineering attitude to product design, and learn how to define and segregate the necessary and unnecessary costs.



Trouble Shooting Component Defects in a Press Shop

- 25-26 September 2014, Pune
- 18-20 May 2015, Pune

In a Press Shop, 'production runs' are carried out for stamping a number of sheet metal components. Each component requires a number of dies running on multiple presses.

Press Shop personnel have to fine tune some settings to get the desired results. This is sometimes tricky and valuable time and material gets wasted. This calls for specialized skills which are not always available readily on hand. IMTMA organized two workshops in 2014 and 2015 at Pune to systematically evaluate the dies before accepting them for production, understand the various defects which occur in production runs, apply the right methods for ironing out defects, follow the correct procedure during welding of dies for emergency repairs and modifications, and



understand the right techniques for refurbishing dies.



Design & Analysis of Machine Tool Spindle

- 25-26 September 2014, Pune
- 25 26 November 2014, Pune

Machine tool spindle is the most sophisticated member in machine tool and plays a vital role for better performance, higher efficiency and accuracy. Design of spindle is very important and a critical activity of machine tool design process. It is very essential to analyze and optimize the design for low cost and better performance.

Sizing of the spindle for machine capability in terms of dimension, power, speed, force and accuracy are the key challenges for machine designers for the right machine and right application. IMTMA organized a two day training programme at Bangalore.



CNC Machine Selection, Testing & Acceptance

10 October 2014, Pune

Companies are now reinstating stalled projects and planning new investments in

plant and machinery. In this context selecting the most appropriate CNC machines, testing them and ensuring that they would deliver as per requirement is very important to prevent unproductive investment. Is there a systematic or scientific process to achieve this?

Considering the need to have a structured process including interaction between a buyer and supplier, prior to ordering a machine tool, IMTMA organized a one day programme covering the technical considerations for CNC machine tool selection, commercial considerations for CNC machine tool selection, and process capability acceptance of CNC machines.



Measuring Productivity through OEE

- 14 October 2014, Pune
- 8 April 2015, Bangalore

Profitability in any company is determined by efficiency of operation. Overall Equipment Effectiveness (OEE) is a key performance indicator, which measures out of available time how much time is efficiently used in producing saleable goods. In most companies bottleneck machines or key machines determine throughput of the process. Manual collection and processing of data is tedious and at times erroneous. Automatic data collection followed by idle time analysis helps management to continuously monitor productivity on the shop floor and take measures to reduce idle time thereby improving productivity.



IMTMA organized a one day programme covering productivity metrics using OEE, losses in production, concept of OEE calculation, common myths in calculating OEE and taking account of losses, and help participants understand the benefits of monitoring OEE.



Basics of Gear Manufacturing Process

- 17 18 October 2014, Pune
- 21-23 April 2015, Bangalore

Gear manufacturing is a fairly complex metal cutting process and forms an integral part of many industrial products. Gears and gear drives are one of the key components of all kinds of vehicles, machine tools, aircrafts, household appliances as well as a broad variety of industrial equipments.

Proper understanding about the various gear manufacturing processes and controlling parameters is essential in order to meet the growing demands for better productivity and quality of gears. IMTMA organized a seminar that gave participants an overview of gear manufacturing methods, gear hobbing, high speed gear hobbing with case studies, gear shaping, gear shaving, gear grinding and live demonstration of gear manufacturing processes.



Advanced Programming for CNC Machining Centres

28-30 October 2014, Bangalore

CNC Machining Centres form the core of manufacturing operations right from producing auto parts to machine critical aerospace components. Its effective application can ensure increased productivity, highest accuracy, rigidity and improved surface finish.

In modern CNC machine shops, every second counts and the CNC programme drives the machine efficiency and productivity. Many a time the CNC programme contains lots of idle movements (air cutting) and is not optimized for minimum cycle time. Enhanced knowledge on CNC programming and its control features are now very critical to keep the cost per component to the minimum. IMTMA organized a three day programme that introduced participants to CAM programming; applications and advantages and make them understand advanced programming concepts including scaling, mirror, and polar co-ordinates, etc.



Geometric Dimensioning and Tolerancing (GD&T) in Design through Manufacturing

- 30-1 October 2014, Pune
- 11-12 February 2015, Gurgaon
- 11-12 June 2015, Bangalore

Geometric Dimensioning and Tolerancing (GD&T) system eliminates ambiguities in engineering drawings and brings out the designer's intent very clearly. concept of OEE calculation, common myths in calculating OEE and taking account of losses, and help participants understand the benefits of monitoring OEE.

It ensures seamless communication b et ween design, engineering, manufacturing and quality teams across the entire organization enabling them to work in a concurrent engineering environment. Application of GD&T system helps to reduce the manufacturing and inspection costs drastically. IMTMA organized a two day training programme that focused on understanding the system of GD & T and the methods of applying it in real time designs supported by examples, practical demonstrations on CMM and exercises.



Spindle Maintenance for Metal Cutting & Industrial Machinery

- 4-5 November 2014, Pune
- 26-27 June 2015, Bangalore

Maintenance of spindles in metal cutting or industrial machinery is a critical function of a maintenance engineer. Technicians maintaining them typically require special diagnostic tools and intense technical training.

Often component deviations can be traced to faulty spindles. Spindle maintenance requires a thorough knowledge of bearing application, lubrication, assembly tools and techniques. IMTMA organized a two day programme to help participants understand the types of spindles and their construction, learn the step by step procedure for spindle maintenance, understand preloading of bearings, fits and tolerances for housing and spindles, and learn about spindle assembly and testing using propertools.



Effective Sales & Marketing of Machine Tools

14-16 October 2014, Bangalore

A good marketing team represents the face of the company as it needs to project the brand, its key strengths, products and services in order to convince the customers. Being capital equipment, effective marketing assumes far greater significance, specifically in case of machine tools and accessories.

India's machine tool industry greatly requires systematically trained sales and marketing engineers who are able to effectively differentiate the products' strengths across to the customer and win more business. IMTMA organized a three days' workshop that focused on the key issues in machine tool marketing, CNC programming, and help participants understand the technical aspects of CNC machine tools including sub systems, tooling and accessories.





Maintenance and Trouble Shooting of Industrial Hydraulic Systems

11-13 November 2014, Bangalore

Hydraulics systems form the basic methods of powering the industrial machinery. They form an integral part of any mechanical system and find a variety of applications in the manufacturing industry - right from simple ones to sophisticated CNC machine tools.

Today, the advent of electro hydraulics opened up new fields of application with more challenging tasks in process control. Proper knowledge about the hydraulics and hydraulics circuits is a must for maintenance engineers in order to ensure trouble free operation of the systems as well as to undertake trouble shooting activities. IMTMA organized a three day programme to help participants learn the function of hydraulic components, symbols and circuit diagrams, hydraulic technology in machine tools, energy saving measures in hydraulic power packs, and maintenance and troubleshooting of hydraulic circuits.



Idle Time Reduction in Metalworking through Quick Changeover Techniques

- 15 May 2014, Chennai
- 14 November 2014, Pune

The need for idle time reduction through quick changeover / set-up time reduction is becoming significantly important due to increased demand for product variability, reduced product life cycles and the need to reduce inventories, in metal working.

The manufacturers must have the ability to produce smaller batch quantities and deliver them more quickly. They must be able to utilize equipment for as many different parts as possible. IMTMA organized a one day programme that focused on the concepts of set-up/ changeover time and benefits, review of waste in processes, relation between changeover and waste, and give knowledge to participants on how to define the features of a changeover and learn how to eliminate waste.



Cleaning of Machined Components

- 14 November 2014, Bangalore
- 22 April 2015, Gurgaon

Parts cleaning, like most metalworking processes, are experiencing ever tightening specifications. It is highly critical especially in case of automotive components, aerospace and medical implants. Parts cleaning is often the most ignored area in the production lines.

Cleaning is commonly considered as nonvalue adding process; without evaluating the consequences of ignoring component cleaning. A successful cleaning process requires careful selection of both the cleaning chemistry and equipment. Cleaning process is influenced by various factors viz. manufacturing process, cleaning media, surrounding conditions, work-piece quality, parts handling, machine technology, testing process (Millipore test), etc. IMTMA organized a one day seminar to expose participants to the industrial cleaning process, contamination in machining process, technical measurement analysis and statistical data capture, different types of cleaning media, and important factors influencing cleaning results.



Defect Analysis & Trouble Shooting of Injection Moulded Components

18-19 November 2014, Bangalore

We are said to be living in an era of 'plastics' since 1974, as the world consumption of plastics from that year onwards exceeded that of steel by volumes! From household appliances to airplanes, from tooth brushes to telephones, from computers to cars, everything seems to be made out of plastics these days.

Injection moulded plastic parts offer unbeatable combination of light weight construction, flexibility, toughness, chemical resistance, long-term performance and cost effectiveness. The defects in injection moulding may be caused by poor part design, wrong selection of material, poor injection mould design, poor manufacture of mould, nonoptimum process parameters and wrong matching of mould with machine amongst others. Knowledge of ways and means of overcoming these defects is necessary to obtain world class injection mouldings. IMTMA organized a two day programme to educate participants on how to prevent occurrence of defects in molded parts, identify causes of defects, and address the defects with suitable remedies.



Cold Forging / Cold Extrusion Technology

- 20-21 November 2014, Bangalore
- 16-17 January 2015, Gurgaon
- 26-27 May 2015, Pune

In today's manufacturing scenario, where shortage of raw materials, power and increasing pressure to reduce costs are the order of the day, 'Cold Forging' is possibly the most suitable solution for these pressing issues.

Cold forging technology utilizes innovative design coupled with process sequencing to not only reduce costs by utilizing lesser raw material but also imparts greater strength to the component, in addition to increased productivity. IMTMA organized a two day workshop that gave participants an overview of cold forging technology and their specific industry applications, understand process sequence and the parameters involved in cold extrusion, and learn the procedure for designing cold forging dies.





Selection, Assembly and Trouble Shooting of Linear Motion Guide Ways and Ball Screws for Industrial Machinery

- 22 November 2014, Gurgaon
- 24 December 2014, Bangalore
- 5 September 2014, Pune

Linear Motion Guideways and Ball Screws form one of the critical elements of precision industrial machinery. In latest CNC machines, the speed and accuracy of axis movements required for high speed machining is realized by adopting LM Guide technology.

Recirculating Ball screws are available in different configurations and accuracy grades. Proper selection and mounting of these elements is crucial for achieving the desired levels of accuracy on modern machine tools. IMTMA organized a one day training programme to make participants understand the accuracy standards of LM guides and ball screws and make them go through the correct procedure for mounting and assembly of LM guides, and get them to understand what is pre loading and what are the pre loading methods for ball screws.

TOPS-8D-Structured Method of Problem Solving for Engineering Industries

25-26 November 2014, Pune

Critical, complex problems arising from cross-functional disciplines in the work environment can wreak havoc and affect



your bottom-line big time if the root cause is not identified quickly and correctly. TOPS-8D is a highly structured, problem solving tool perpetuated by FORD and is used by effective managers across the world in problems pertaining to product / process quality as well as non-technical management/marketing zones.

Understanding of the data handling and analysis tools included in the TOPS-8D approach can make all the difference. IMTMA organized a two day programme to make participants learn TOPS - 8D approach of problem solving, with case studies and examples.



Advanced Concepts of GD&T

- 27 28 November 2014, Bangalore
- 25 26 June 2015, Gurgaon

Geometric Dimensioning and Tolerancing (GD & T) systems have been evolving over the last 20 years. Globalization in various streams of engineering has been instrumental in defining the details and implementation. Thorough understanding is a must across the design, manufacturing and quality teams for implementing GD&T and realizing the true benefits in terms of interchangeability, reduced cost, reduced re-work, simplified inspection and gauging, etc.



IMTMA organized a two day programme to help participants distinguish about using tolerances at RFS, MMC and LMC conditions with practical applications, learn functional gauge design for GD&T parameters, and gain a practical insight into inspection of GD&T features using conventional methods, Co-ordinate Measuring Machine and functional gauges.



Automation Project Implementation

- 10-11 July 2014, Bangalore
- 27 28 November 2014, Gurgaon

For automation to be successful, several aspects such as selection of automation system, system integration and organizational environment need careful consideration. Appropriate level of automation reduces cost in manufacturing not only through increased productivity but also improves quality through consistent and reliable production.

IMTMA organized a two day programme that focused on various elements of automation and the economic benefits derived through applying automation in the manufacturing process.

Hands-on Training in Dimensional Metrology

3-5 December 2014, Bangalore

Dimensional inspection assesses the geometric characteristics of parts and products to assure their compliance with design requirements and verifies the accuracy of product features that can



decide reliability and functionality of the product/production.

Engineers and technicians involved in manufacturing processes and measurement applications need to have sound knowledge in proper selection, application, and care of typical measurement systems. Best practices in dimensional metrology need to be followed for obtaining reliable measurements. IMTMA organized a three day programme to enhance the level of competency in usage of precision hand tools, bench top measuring instruments, attribute gauges and other advanced measuring systems including surface roughness tester, roundnesstester and CMM.



Design of Pressure Die Casting Dies

9-10 December 2014, Bangalore

Die Casting is a versatile process for producing engineered metal parts by forcing molten metal under high pressure into reusable steel molds. The Pressure Die Casting process is the shortest route to convert metal to components of light alloys. Pressure Die Casting has replaced many cast iron parts in appliances, automotive and aerospace fields.



By careful design, it is possible to get strong, stiff and yet light weight constructions with Pressure Die Casting. To achieve maximum benefits from this process, proper die design assumes paramount importance. IMTMA organized a two day training programme giving participants an overview of die casting materials, PDC Process and Machine, scientific design procedure for PDC dies, cost estimation of dies, etc.



Robots Operation and Programming

15 - 17 December 2014, Bangalore

Robots have been proven to deliver a host of benefits in a wide variety of industrial applications including material handling/ assembly, arc / spot welding, painting, deburring, plasma cutting, etc. Industries introducing robots to their production processes have typically seen a significant transformation in their productivity and efficiency, with higher levels of output and consistent product quality.

IMTMA organised a three day hands-on workshop to make participants learn the fundamentals about industrial robots and their applications, robot specifications, parts of robot and controller, operation of robots through hands-on training, programming and simulation of robots through Robo Guide, and grippers to be used with robots.



Injection Molding Process Development via Scientific Principles

16-17 December 2014, Pune

The goal of a molder is to mold parts consistently with the most efficient process and with least human intervention. This can only be achieved when the process that is set up on the molding machine is robust, repeatable and reproducible. IMTMA organized a two day programme that introduced the key factors that contribute to the molding process, all the injection molding variables and the underlying principles of process development. The programme also focused on scientific processing and scientific molding.



Tolerance Stack-up Analysis

- 22-23 December 2014, Bangalore
- 23 24 June 2015, Pune

Dimensional variations in production parts accumulate or stack up statistically and propagate through an assembly kinematically, causing critical features of the finished product to vary. Such variations can cause costly problems, requiring extensive rework or scrapped parts. One of the effective tools for managing variations is Tolerance Analysis.



IMTMA organised a workshop to help participants perform and develop a tolerance stack-up analysis, decrease excess tolerance requirements and increase part fit and function, and learn how designers could reduce the effect of tolerance stacks in assemblies.



Latest Trends in Laser Plasma & Water Jet Cutting

9-10 January 2015, Bangalore

'Laser Plasma' and 'Water Jet' processes are fast gaining popularity as "Net Shape" solutions. These processes can compete both technically and economically with conventional and non-conventional machining processes and can meet the challenges of achieving high quality, reliability and price.

In recent years, laser-based applications have widened their scope including deep penetration welding, surface modification (cladding, hardening, alloying and cleaning), laser milling and specialized laser cutting, including thick section cutting and 3D profile cutting using multiaxis machines. IMTMA organized a two day seminar that introduced delegates to the latest development in plasma cutting, laser applications in drilling, marking and engraving, waterjet machining, and programming software for improving performance of laser, plasma and waterjet machining.



Inspection of Sheet Metal Formed Components

- 19 August 2014, Pune
- 13 January 2015, Pune

Stamping and bending allows sheet metal to be produced according to any desired freeform shape. The shape of the mating surfaces is important to obtain a good fit between assembled parts. To ensure that geometry specifications are actually met, freeform surfaces can be verified using many inspection methods depending on the complexity of the feature, the tolerance expectation and the class of the component.

Inspection of Sheet Metal Formed Components is an important and challenging activity at the dies tryout and proving stage as well as during the mass production stage. IMTMA organized a one day training programme to help delegates gain an understanding of sheet metal drawing, inspection process and the role of checklists, evaluate dimensional data for conformance of the part checked, and understand the various parameters and method of inspection.





EMC Requirements and CE Certification for Export of Machine Tools

19 February 2015, Bangalore

Machine tools incorporate motors, heating elements or their combination, contain electric and electronic circuits powered by the electric power source and are designed for industrial use. The machine tools need to be tested for their conformity to electromagnetic compatibility for electromagnetic immunity and emission, meeting the requirements as per EN-50370-Product.

Family Standard for machine tools. Electromagnetic compatibility is now one of the defining parameters of product quality. It includes measurement of conducted emission, radiated emission and electrostatic discharge, etc., as per the relevant product family standard for machine tools. IMTMA in association with Advanced Machine Tool Testing Facility organized a one day workshop that gave a general introduction to electromagnetic compatibility fundamentals and terminology, electromagnetic compatibility measurement methods and standards, electromagnetic compatibility measurement for machine tools, CE certification for machine tools, etc.



Metallurgy for Designers of Industrial Machinery

- 19-20 February 2015, Bangalore
- 21-22 May 2015, Gurgaon

Metallurgy pervades the full gamut of engineering product design and processes. In the present day of high degree of quality with low degree of rejection of products, sound knowledge of metallurgy is of paramount importance for designers.

This will enable optimum selection of materials in order to achieve a product which is first time right as well as maintain the desired quality of the product throughout its life cycle. IMTMA organised a two day workshop covering the concepts of metallurgy with an analytical and quantitative approach.



Latest Trends in Die & Mould Manufacturing

26-27 February 2015, Pune

Changing customer expectations and rapid model changes requires a fast turnaround in the manufacture of Dies & Moulds. Presently, production demands require the ability to react to frequent product changes, shorter production runs, lower inventory levels and higher productivity. To meet these challenges a host of new



technologies have evolved over the years. IMTMA organised a two day seminar covering the relation between "first time right mould design" and reduction in mold manufacturing lead time, latest machine tools for die and mould machining, advanced materials for die and moulds, etc.



Workholding and Fixturing Clinic for Production Engineers

12-13 March 2015, Bangalore

Innovative solutions in workholding and fixturing result in defect free and smooth production. Their optimum use not only improves productivity but eliminates quality defects. Often problems related to poor quality and productivity is a direct consequence of poor fixturing in terms of its choice or design.

Reduction in set-up change is a challenge most manufacturers face and this is directly related to quality of fixturing. IMTMA organised a two day workshop that covered trends in fixturing, workholding solutions for CNC Turning applications, design of pneumatic / hydraulic fixtures for volume production, and single minute exchange of dies.



Design of Experiments -An Approach to Robust Product & Process Quality with Real Life Examples

7-8 April 2015, Pune

Design of Experiments (DoE) is one of the most successful structured approaches in understanding the real life issues in identifying the critical factors and interactions in causing the issue. DoE helps in delivering an effective solution by controlling them.

Many techniques and approaches utilise DoE in finding out those inputs which have maximum influence on the output through a minimum set of experiments. DoE saves considerable time and efforts in trouble shooting, identifying quality inputs and in rectifying the total system. IMTMA organised a two day training programme that gave participants an overview of DoE and its elements, understand the full factorial over fractional factorial designs, overview of orthogonal array designs for DoE in Taguchi method, and benefit and structure of inner and outer array.





Modern Automotive Needs and Latest Trends in Forging Technology

10 April 2015, Pune

Auto, agricultural and construction industry is going for continuous change and this change is the result of customer demands as well as new environmental norms. Forgings contribute a major share in vehicles in terms of weight, strength and value. Forging industry is aligning itself with various technological solutions for the evolving demands from the automotive sector.

IMTMA organized a one day seminar which covered forging as a technology, metallurgy of forgings, new norms of auto industry, how forging contributes towards stated and implied expectations, role of metallurgy and forging technology as per new norms, latest methods in forging technology, and strategy for global competitiveness of forging industry.



Design for Manufacturing and Assembly

- 12-13 August 2014, Bangalore
- 15 16 April 2015, Pune

Quality, Cost and Delivery (QCD) are the key elements which make a product successful in the global competitive scenario. Design for Manufacturing and Assembly (DFMA) is a set of guidelines developed to ensure that a product is designed so that it can be easily and efficiently manufactured and assembled with a minimum of effort, time, and cost. DFMA will help designers to build quality into robust design at least cost. IMTMA organized a two day programme that covered DFMA, design for assembly, design for process capability, product design for manual assembly, design guidelines for manufacturing, and design for environment.



Advanced CNC Programming for CNC Machining Centres

15-17 April 2015, Bangalore

CNC Machining Centres form the core of manufacturing operations right from producing auto parts to machine critical aerospace components. In modern CNC machine shops, every second counts and the CNC programme drives the machine efficiency and productivity. Many a times the CNC programmes contain lots of idle movements (air cutting) and are not optimized for minimum cycle time.

Enhanced knowledge on CNC programming and its control features are now very critical to keep the cost per component to the minimum. IMTMA organized a three day programme that covered optimization of programming for various machining centre operations, programming using R-variables, rigid tapping and thread milling applications, and CAM programming.



Performance Improvement in Foundries

17 April 2015, Pune

Foundries normally struggle to make profit. Each foundry set up is unique by way of infrastructure, type of product mix, available skill levels and working culture. What is planned while creating a foundry set up is not practically achieved. Often, the productivity levels in foundries are low. There is tremendous scope for removing waste and losses in foundries and even in adverse market conditions foundries can be profitable.

IMTMA organised a one day training programme covering identification of losses, identification and bifurcation of generic and specific losses which are product related, structured process for actions and tracking effectiveness of actions and sustenance.



Calibration of CNC Machine Tools

17 April 2015, Bangalore

Machine tool calibration is rapidly becoming an essential part of the manufacturing process with customers demanding higher accuracy from machine tools for handling precision parts with tighter tolerances. Machine tool accuracy affects not only accuracy of parts produced but productivity as well and is often the root cause of component quality issues and hidden costs.

Machine tool calibration can be performed to check accuracy and track machine capability or performance degradation due to wear. Calibration of machine tools becomes an essential part of predictive maintenance programme in companies to achieve "Doing it right the first time". IMTMA organized a one day programme introducing the delegates to calibration, accuracy, repeatability and resolution, national and international standards for determining positional accuracy and repeatability of machine tools.



Primer Course on Sheet Metal Forming Technology

24 - 25 April 2015, Pune

Metal forming technology, over the last few decades has gradually revolutionised and redefined concepts of manufacturing quality products at lower cost, both in high and low volumes, leading to greater flexibility in manufacturing of finished goods. Recent processes have stretched the technology frontier to greater lengths, providing a competitive edge to corporations in the business of manufacturing.

Sheet Metal Forming Technology plays a crucial role in a variety of product segments like automobiles, auto-components, consumer durables and other sheet metal products for delivering high quality



products. IMTMA organised a two day programme that covered mechanics of sheet metal forming, description and measurement of sheet metal properties, forming grade steel sheets, forming presses and their selection.



Implementing Statistical Process Control (SPC) and Basic 7 QC Tools

24-25 April 2015, Bangalore

Statistical Process Control (SPC) is a technique to enable measurement and analysis of the variations at the workplace and try and control the same at optimum levels. While SPC techniques involve the extensive use of various types of control charts, an understanding of all the basic seven quality tools helps in a better understanding and implementation of SPC.

IMTMA organized a two day workshop covering the fundamentals of statistics, objectives and benefits of SPC, understanding of common and special causes, machine and process capability, analysis of control charts, etc.



Geometric Dimensioning & Tolerancing in Design through Manufacturing (GDTP Technologist Level - ASME)

27 - 29 April 2015, Pune

Geometric Designing and Tolerancing system eliminates ambiguities in engineering drawings and brings out the designer's intent very clearly. It ensures seamless communication between design, engineering, manufacturing and quality teams across the entire organization enabling them working in a concurrent engineering environment.

In the competitive industrial scenario prevailing today, proper application of GD & T system helps the companies to reduce the manufacturing and inspection costs. IMTMA organized a three day programme that gave participants an understanding of the system of GD&T and the importance of applying correct GD &T on drawings.



Reducing Cycle Time and Machining Cost on CNC Machining Centres

6 - 7 May 2015, Pune

Reduction in cycle time and machining cost plays an important role in enhancing productivity especially in large volume production. In the highly competitive market scenario, customers determine the price of a product and entrepreneurs need to continuously fine tune the costs to realize profits.

Most CNC machines are underutilized with only 20% time effectively spent in cutting and the rest in non-value adding operations. Reducing cycle time requires eliminating or reducing non-value-added activity. IMTMA organized a programme that focused on knowledge inventory, fineries of machining centre operations and techniques, machining data collection method and worksheet preparation for analysis.



Excellence in Capital Goods Marketing

8 May 2015, Pune

Marketing is a very big challenge for the capital goods industry in the current scenario. Competition is severe not only from domestic players but from all over the world. Marketing brings growth and revenue to the company. To be successful in the market is both science and art. IMTMA organized a one day seminar in Pune. The seminar introduced the delegates to hologram of the GenNext marketing executive, value selling versus price selling, winning customers trust and building relationship, and why a customer should buyyour product.



Visual Factory / Visual Management: Paving Way for Lean, TQM and TPM Implementation

8 May 2015, Pune

Visual Factory / Visual Management refers to how data and information is conveyed at the time and place it is needed, using visual methods such as signs and charts. The visual factory is one of the key concepts of lean manufacturing and it reduces the time and resources required to communicate information verbally or in written form.

IMTMA organized a two days training programme in Bangalore that introduced the delegates to visual management for manufacturing industries, six levels of visual management, and proper work place organization.



Surface Finish & Its Measurement

12 May 2015, Bangalore

In precision engineering industry, the functional properties of a component are affected by the boundary areas (or the surface) of the component. The unceasing demand for increased performance, interchangeability and functional reliability has resulted in shrinking of tolerances for a precision component.

As the tolerances shrink the surface aspects of the component become more and more dominant and the dimensional aspects of



surface finish get to be exceedingly important. A serious quantitative study of the quality of a surface becomes an inseparable part of component design, manufacture and inspection to ensure proper functional behaviour of the design. IMTMA organized a one day workshop to a d d r e s s the importance and methodologies of evaluation in diverse range of manufacturing activities.



Calibration of Dimensional Measuring Instruments & Evaluation of Uncertainty

15 – 16 May 2015, Pune

Obtaining accurate, reliable and traceable measurements is one of the basic requirements in order to achieve required levels of product quality, in any manufacturing activity. No measurement is exact and every measurement is subject to some uncertainty. Measurement uncertainties can occur from the measuring instrument, from the part / component being measured, from environment, from the operator, and/or from other sources. IMTMA organized a two day training programme at Pune introducing calibration and its relevance to ISO 9000 / QS 9000 including the care and environmental influences, calibration methodologies, documentation aspects of calibration, calibration and associated uncertainty.



Basics of Programming and Operation of CNC Machining Centres

25 – 29 May 2015, Bangalore

CNC machines have become the order of the day in every manufacturing industry. These applications are wide spread in mass production units, batch production as well as in tool room industries. Thorough understanding of programming and operation of the CNC machines is a must in order to realize the maximum output.

IMTMA organized a five day programme that focused on the elements and different modes of CNC machining centre, G and M codes applicable to CNC machining centre, and structure of a CNC programme for CNC machining centre.

Design for Performance through FEA / FEM – A Practical Approach for Industries

9 – 10 June 2015, Pune

Finite Element Analysis (FEA) has become the mainstay of engineering design and development to accelerate new product development. Practical methods to implement FEA as a part of the design validation process needs emphasis with a proven approach addressing real-world situations. In order to stay competitive and profitable manufacturing industries should focus on innovation and technological upgradation by incorporating best-in-class process as applied to design validation.

IMTMA organized a two day programme that gave delegates an introduction to FEA,



domains of application for FEA, benefits of FEA in product design and development, basic concepts in FEA, and design validation process for robust product design and development.



Hydroforming and its Application

12 June 2015, Pune

Hydroforming is considered as one of the prominent and niche technologies to deliver lightweight components. Comparing to conventional manufacturing via stamping and welding, or forging and machining, hydroforming offers several advantages such improvement in product integrity, better strength to weight ratio, better structural stability, decrease in product weight, cost and tool cost, fewer manufacturing stages, and better compatibility to post operations.

IMTMA organized a seminar that focused on the principles and types of hydroforming, scope of hydroforming for light weighting, product integrity improvement and value engineering.



Additive Manufacturing / 3D Printing Technology

19-20 June 2015, Bangalore

Additive manufacturing / 3D Printing throws open newer possibilities for reproducing complex designs into real objects. Additive manufacturing plays a key role in robust product development as the prototype is made directly from CAD thus making possible the form, fit and functional checks at the early stage of design cycle. IMTMA organized a two day workshop that provided participants an in depth understanding of additive manufacturing types, applications, advantages and limitations.

Customized Programmes

- For Ceratizit India: 28 July -22August2014, Bangalore
- For WMT: 14 16 October 2014, Bangalore
- Assembly Technician Training -M2;6-18October214, Bangalore
- For TVS Motors: 8 13 December 2014, Bangalore
- For TVS Motors: 5 14 January 2015, Bangalore
- For Bharat Forge: 13 18 April 2015, Pune
- For TVS Motors: 22 28 April 2015, Bangalore
- IMTMA also conducted customized training programmes for companies in their premises



TRAINING PROGRAMMES Design Institute Programmes



Machine Tool Design - Rapid

• 24 November 2014 - 5 January 2015, Bangalore

For carving careers in machine tool design, IMTMA conducted a 36 days course covering design fundamentals, more focused on machine tool design. A complete design of CNC Turning Center was carried out from concept to finish. Pre-process activities like design input, conceptualization, machine specification, 3D modelling of parts, subassemblies and final assembly using popular design CAD tools and preparing the final manufacturing drawings in par with industry standards.



Selection of LM Guide Way and Ball Screw for Machine Tools

- 27 September 2014, Bangalore
- 24 December 2014, Bangalore
- 9 May 2015, Bangalore

Linear Motion Guideways and Ball screws form one of the critical elements of precision industrial machinery and in latest CNC machines, the speed and accuracy of axis movements required for high speed machining is realized by adopting LM guide technology. IMTMA conducted a one day training programme on three different occasions to address all the relevant aspects of LM guideways & ball screws right from types, selection criteria, and mounting procedure supported with case studies.



Machine Tool Design -Professional

18 August - 31 October 2014, Bangalore

It's a 60 days comprehensive course structured from basic to advanced level of topics dealing in machine tool design. The course covered the entire aspects of machine tool design including machine design fundamentals, design of machine elements, limits, fits and tolerance, CNC machine tools, and design of hydraulic system for machine tools. The objective was to give delegates complete knowledge in engineering fundamentals, design of machine elements, design standards, and design and drafting skills.



Design of Hydraulic System for Machine Tools

- 13 September 2014, Bangalore
- 11 December 2014, Bangalore
- 28 April 2015, Bangalore

Hydraulics systems plays a very important role in the trouble free operation of a machine tool and finds a variety of



application in the manufacturing industry. The demand for faster production, better quality at low cost, reduced waste with energy efficient devices necessitates the need for right selection of hydraulic elements which makes the basic method of powering the Machine tools. IMTMA organized a one day programme that provided an in depth understanding of Design, selection and elements of Hydraulics circuit diagram.



Design of Fixture -Specialization

- 16-26 February 2015, Bangalore
- 15-25 June 2015, Bangalore

Design of Fixture is key to effective utilization of machine tools. IMTMA conducted a 6 days course on two separate occasions to give participants a comprehensive design knowledge of "fixture design". The course enabled delegates to learn more about fixture design fundamentals, jigs and fixture, basic elements of fixture, design exercise for simple fixtures, and fixture design for micro components with case study. Hydraulics and pneumatics for fixture were also discussed.



Machine Tool Design – Mechanical

• 6 April - 31 May 2015, Bangalore.

Machine Tool Design – Mechanical, is a 48 days duration course covering the topics from design fundamentals to final machine design. A complete design of CNC Turning centre / Machining centre is carried out as a design exercise from concept to finish. The course enables delegates to learn more on design input, conceptualization, machine specification and 3D modelling of parts, sub-assemblies and manufacturing 2D drawings with all discipline at par with industry practices using popular design CAD tools.

Placement Success

Our intensive machine tool design course – Machine Tool Design Mechanical has a placement success rate of more than 80%. Candidates who have undergone this course have been successfully absorbed in leading manufacturing companies such as Ace Designers, Ace Manufacturing Systems, Cimtrix, Batliboi, Bharat Fritz Werner, Conceptia, ETA, FANUC India, Galaxy Machinery, IPA, Kennametal, KLADON DESIGN, Micromatic Grinding Technologies, Miven Mayfran, MTAB Engineers, SPM, Strategi Automation and UCAM.



Activities of



81st UFI Congress

Bangalore International Exhibition Centre (BIEC) was at the 81st UFI Congress held at Bogota, Columbia, from 29 October to 1 November 2014.

Over 300 delegates from 46 countries visited Columbia for a 3 day event. The Congress was hosted by regional industry association (AFIDA) and Corferias, Columbia's leading exhibition business.

The event gave a unique opportunity for BIEC to increase its visibility and promote BIEC brand at the international level. UFI Congress was also a forum to network with global exhibition industry representatives.



ICCA Congress at Antalya: MICE Organizers Welcome BIEC

ICCA Congress gives opportunities for delegates to exchange information about key international events. BIEC team met with representatives of MICE (Meetings, Incentives, Conferencing and Exhibitions) organizers from around the world for getting a bird's eye view of the trends and best practices in the MICE industry globally.



BIEC was attending ICCA Congress for the first time after becoming its member. The event was held at Susessi & Cornelia, Antalya, Turkey from 1 to 5 November 2014.



10th UFI Open Seminar in Asia

Bangalore International Exhibition Centre (BIEC) participated in the UFI Open Seminar in Asia held in Hong Kong on 12 and 13 March 2015. The seminar was the largest till date and mainly focused on strategic exhibiting, sustainable practices, and building exhibitions with unique themes. BIEC gained insights into the latest trends and global best practices in exhibition industry.

Innovative Catering Concepts for Exhibition Industry

UFI organized its first ever Catering Forum in London in April 2015. Bangalore International Exhibition Centre (BIEC) was invited for UFI's first ever Catering Forum. The main objective of the event was to offer participants insights into successful concepts with high footfall and new gastronomic trends, movements and eating habits in order to potentially integrate them in the field of gastronomy wherever possible. BIEC gained exposure to the latest trends and best practices of the global exhibition industry.



Activities of β



IEIA 5th Open Seminar

Over 200 delegates from India and the global exhibition industry attended the IEIA Open Seminar at the Indian Expo Mart, Noida, Delhi NCR, from 8 to 9 May 2015. The event was organized by the Indian Exhibition Industry Association. The theme of the seminar was Excellence in Exhibitions -MAKE IN INDIA. Industry professionals from the global as well as the Indian exhibition industry presented their perspective on the theme. Mr. V. Anbu, CEO, Bangalore International Exhibition Centre, moderated the Panel Discussion "3 big opportunities and challenges in the Indian Exhibition Business over the next 2 years". BIEC also sponsored the dinner for the seminar.



First ever UFI-Exhibition Management Degree programme in India at BIEC

UFI, the Global Association of the Exhibition Industry, working with the University of Cooperative Education in Ravensburg, Germany has created the "Exhibition Management Degree (EMD)" to train exhibition industry professionals to meet tomorrow's event management demands. UFI-EMD is one of the key educational programmes which help the exhibition industry professionals to improve their competitive position and to upgrade their qualifications.

The first ever UFI-EMD programme in India was supported and hosted by Bangalore



International Exhibition Centre (BIEC) from 18 to 23 May 2015. The first module which was completed successfully was attended by 15 exhibition professionals from all over India. The module provided necessary knowledge about successfully managing exhibitions, convention centres and conferences. The second module included subjects like strategic management, controlling, logistics and special event management. The attending managers took home methods, technical skills, recommendations for trade show strategies and practical solutions. This way, they were able to improve their competitive position and upgrade their professional qualifications.



President of India Inaugurates Mobile One e-Governance at BIEC

Hon'ble President of India Shri Pranab Mukherjee visited BIEC to inaugurate 'Mobile One', Karnataka Government's mobile app on 8 December 2014. Also present on the occasion were Shri V. R. Vala, Hon'ble Governor of Karnataka and Shri Siddaramiah, Hon'ble Chief Minister of Karnataka.

The app was developed as part of the State government's ambitious mobilegovernance project for providing a host of government and private services on cell phones.



WORLD MACHINE TOOL SCENARIO 2014

Production of machine tools around the world during Calendar Year 2014 increased by a marginal 1%. Output by 27 principle producing countries was USD \$ 83.6 billion. Among the major machine tool manufacturing countries, larger gainers were Japan with 13% increase, India with 12% increase, Russia with 11% increase, South Korea with 9% increase, and Switzerland with 8%.

Top three machine tool producing countries were China followed by Germany and Japan. Output from top three countries account for about 61% of the total world production during 2014.

China continues to be the largest machine tool consuming country in the world which installed about USD 31.7 billion worth of machine tools. On per capita consumption basis Switzerland, South Korea, Germany, Austria and Taiwan tops the list.

Based on Gardner's 'World Machine Tool Consumption Survey Report', India ranks 14th in production and 10th in consumption during 2014.

Consumption of Machine Tools

Top 5 Machine Tool Consuming countries during 2014				
Country	Value in USD Mn	Share in Global Consumption	Rank	
China	31,700.0	41.3%	1	
United States	8,056.3	10.5%	2	
Germany	7,389.2	9.6%	3	
Japan	5,150.2	6.7%	4	
South Korea	4,891.0	6.4%	5	
India	1,416.5	1.8%	10	

Top five machine tool consuming countries are presented in the table below.

WORLD MACHINE TOOL SCENARIO 2014



Global Machine Tool Consumption				
cı	6t	Value in Million US \$		
No.	Country	2013	2014	% of change
1	China, P. Rep.	31,900.0	31,700.0	-0.6%
2	United States	8,048.5	8,056.3	0.1%
3	Germany	7,341.2	7,389.2	0.7%
4	Japan	3,695.8	5,150.2	39.4%
5	South Korea	4,320.0	4,891.0	13.2%
6	Italy	2,034.1	2,478.6	21.9%
7	Russia	2,054.5	2,030.2	-1.2%
8	Mexico	1,924.2	1,708.9	-11.2%
9	Taiwan	1,629.0	1,687.0	3.6%
10	India	1,337.7	1,416.5	5.9%
11	Canada	1,342.0	1,235.0	-8.0%
12	Turkey	1,261.0	1,227.0	-2.7%
13	Switzerland	1,091.6	1,182.8	8.4%
14	United Kingdom	1,077.5	1,087.2	0.9%
15	France	1,079.7	1,068.5	-1.0%
16	Brazil	1,464.9	1,014.6	-30.7%
17	Austria	711.5	725.6	2.0%
18	Spain	413.0	584.8	41.6%
19	Czech Republic	435.5	464.3	6.6%
20	Australia	374.7	333.0	-11.1%
21	Netherlands	332.0	332.3	0.1%
22	Belgium	184.6	241.9	31.0%
23	Argentina	210.0	195.7	-6.8%
24	Portugal	203.2	182.1	-10.4%
25	Sweden	194.2	161.3	-16.9%
26	Finland	118.2	126.3	6.9%
27	Denmark	61.1	65.1	6.5%
	Total	74.839.7	76.735.4	2.5%



ANNUAL REPORT 2014-2015

WORLD MACHINE TOOL SCENARIO 2014

Global Machine Tool Production								
sı		Value in Million US \$						
No.	Country	2013	2014	% of change				
1	China, P. Rep.	24,700.0	23,800.0	-3.6%				
2	Germany	14,800.6	14,167.1	-4.3%				
3	Japan	11,333.6	12,831.6	13.2%				
4	South Korea	5,150.0	5,631.0	9.3%				
5	Italy	5,308.0	5,548.6	4.5%				
6	United States	4,956.1	4,900.4	-1.1%				
7	Taiwan	4,537.0	4,700.0	3.6%				
8	Switzerland	3,143.4	3,402.2	8.2%				
9	Austria	1,179.7	1,204.1	2.1%				
10	Spain	1,245.7	1,184.1	-4.9%				
11	United Kingdom	1,007.1	931.9	-7.5%				
12	France	772.9	764.2	-1.1%				
13	Turkey	719.0	722.0	0.4%				
14	India	576.0	645.3	12.0%				
15	Czech Republic	697.2	625.9	-10.2%				
16	Canada	685.0	571.0	-16.6%				
17	Netherlands	415.7	416.0	0.1%				
18	Brazil	417.5	280.0	-32.9%				
19	Belgium	308.1	277.8	-9.8%				
20	Russia	210.9	234.4	11.1%				
21	Finland	185.9	186.1	0.1%				
22	Mexico	140.6	144.0	2.4%				
23	Australia	160.0	143.4	-10.4%				
24	Sweden	163.4	135.7	-17.0%				
25	Portugal	115.5	111.6	-3.4%				
26	Denmark	47.8	49.2	2.9%				
27	Argentina	36.2	37.5	3.6%				
	Total	83.012.9	83.645.1	0.8%				

WORLD MACHINE TOOL SCENARIO 2014



Top 5 Gainers & Losers in Consumption					
Ga	ainers	Losers			
Country	Percentage of Change	Country	Percentage of Change		
Spain	41.6%	Brazil	-30.7%		
Japan	39.4%	Sweden	-16.9%		
Belgium	31.0%	Mexico	-11.2%		
Italy	21.9%	Australia	-11.0%		
South Korea	13.2%	Portugal	-10.4%		

Source: World Metal Working Consumption report as updated on 8 April 2015, Gardner publications Inc

Top 5 Gainers & Losers in Production						
Ga	ainers	Losers				
Country	Percentage of Change	Country	Percentage of Change			
Japan	13.2%	Brazil	-32.9%			
India	12.0%	Sweden	-17.0%			
Russia	11.1%	Canada	-16.6%			
South Korea	9.3%	Australia	-10.4%			
Switzerland	8.2%	Czech Republic	-10.2%			



TRENDS IN INDIAN MACHINE TOOL INDUSTRY

Production of Metal Working Machine Tools							
	2012-13		2013-14		2014-15		
Machine Tool Segment	Qty	Value	Qty	Value	Qty	Value	
Metal Forming	1383	565	1027	508	1010	462	
CNC	820	376	560	328	371	126	
Conventional	563	189	467	180	639	336	
Metal Cutting	12528	3320	11529	2973	14237	3768	
CNC	9761	2811	9681	2601	12280	3295	
Conventional	2767	509	1848	372	1957	473	
Total Metal Working	13911	3885	12556	3481	15247	4230	
CNC	10581	3187	10241	2929	12651	3421	
Conventional	3330	698	2315	552	2596	809	

Note: Production turnover adjusted to reflect turnover of companies outside IMTMA database Source: IMTMA

					All Vulue	23 111 13. CIOICS	
Export of Metal Working Machine Tools							
	2012-13		2013-14		2014-15		
Machine Tool Segment	Qty	Value	Qty	Value	Qty	Value	
Metal Forming	56	102	35	117	21	41	
CNC	34	70	13	82			
Conventional	22	32	22	35	21	41	
Metal Cutting	449	112	422	130	732	239	
CNC	416	104	378	111	662	219	
Conventional	33	8	44	19	70	20	
Total Metal Working	505	214	457	247	753	280	
CNC	450	174	391	192	662	219	
Conventional	55	40	66	54	91	61	

All Values in Rs. Crores

All Values in Rs. Crores

Note: Export data adjusted to reflect turnover of companies outside IMTMA database Source: IMTMA



TRENDS IN INDIAN MACHINE TOOL INDUSTRY

INDIAN MACHINE TOOL INDUSTRY 2012-13 TO 2014-15



Source: IMTMA

ANNUAL REPORT 2014-2015

All Values in Rs. Crores



NEW PRODUCTS DEVELOPED BY MEMBERS IN 2014-15

ACE MANUFACTURING SYSTEMS LIMITED

- Compact DTC for high-speed machining equipped with pocket tilting ATC [Model Dart-m-XL (DTC)]
- 2. 5 Axis VMC, Simultaneous 5-axis MachiningCentre [ModelG670-5AX]
- 3. Twin Spindle VMC equipped with rotary type pallet changer [Model Gemini-460]
- 4. Twin Spindle HMC, 1st HMC developed in India [Model Gemini-H-330]
- 5. High Productivity Machine for large volume production [Model Fier-V]
- 6. VMC, fully enclosed machine design [Model 850 V]
- 7. VMC for high volume production [Model 1060V]
- HMC with Rotary type APC suitable for hydraulic fixture interfacing [Model MCH-400]

BHAGWATI ENGINEERS

1. Coil Processing Machine Line extensive selection range according to sheet width, thickness and material quality.

BOMBAY MACHINES

- 1. Multispindle Drilling & Tapping Machine for 4 Cyl. Engine Block
- 2. Half Crank & Cam Boring Machine 16 Cyl. Block
- 3. Finish Crank & Cam Line Boring Machine -6 Cyl Block
- Cheek, Thrust Face & Notch Milling Machine-6CylBlock
- 5. Machine for Cutting composites with Diamond Impregnated Wheel
- 6. Right Angle Milling Head for 5 Face Machining Center - 8000 rpm

COSMOS IMPEX (I) PRIVATE LIMITED

- 1. Smartgrind Creep Feed Grinder, wide application in aerospace and automotive industries.
- 2. High Speed Machining Center [Model Phoenix Series]

DIPKALA ENGINEERING WORKS

 Fully Automatic Double Column Ring Cutting Machine [Model RC-300, 630, 850&1050]

DUCOM INSTRUMENTS PRIVATE LIMITED

- 1. High Temperature Pin-on-Disc
- 2. Metal Forming Tribometer (Strip Tribometer)
- 3. High Temperature Advanced air-jet (Standard set by ASTM)
- 4. Hydrodynamic Bearing Testers
- 5. Bio-Tribometer (Multi-station, Multidirection)

ELSCINT AUTOMATION

- Elscint 4 Outlet Automatic Tapping Machine (Photo Automatic Tapping Machine)
- 2. Elscint Rotary Feeder for Cylindrical Drippers (Photo-Elscint-01)
- 3. Elscint Auto Feeding System for Ceramic Rings for Centreless Grinding Machine (Photo-EL-02)
- 4. Elscint feeding system for feeding & blow feed of studs

FERROMATIK MILACRON INDIA PRIVATELIMITED

- 1. Two Platen Maxima Servo Power Machine-525T
- 2. Magna Toggle Servo Machines 550T



GRIND MASTER MACHINERS PRIVATELIMITED

 Robotic Machining Center with Heavy Duty Industrial Robot & CAM Programming Software (Can handle work piece of 1.5M x 1.5 X 1.5M weighing upto 1 ton)

HI-LIFE MACHINE TOOLS LIMITED

 CNC Centreless Grinding Machine (Single Axis)

IND-SPHINX PRECISION LIMITED

- 1. High precision profile cutters for Aerospace
- 2. Precision Micro Punches for Horological Applications
- 3. Special War Parts
- 4. Micro Boring Parts
- 5. Drills & End mills for Carbon fiber Applications

KAWA PRESS SYSTEMS PRIVATE LIMITED

- 1. 400 Ton Straight side single point Power Press with Pneumatic Clutch & Brake
- Hydraulic Press Brake. [Model KCHP 5mtr.X6mm]
- Hydraulic Shearing Machine. [Model KGHV5mtr.X4mm]

UCAM PRIVATE LIMITED

- 1. 6 Axis CNC Gear Hobbing Machine [ModelNOAH400]
- 2. Cantilever Table Dia. 600
- 3. Direct Drive Tilting Table Dia. 600
- 4. Compact Tilting Rotary Table [Model USSR-201-TN-RH]
- 5. Auto Pallet Changer, ideally for VMC [Model APC 7044]



NEW MEMBERS ENROLLED IN 2014 - 15

[As on 30 June 2015]

BESTEK ENGINEERING PRIVATE LIMITED

C-236, Bulandshanhar Road, Industrial Area, Ghaziabad - 201 009, Uttar Pradesh. (Manufacturer - CNC Cylindrical Grinder, CNC Orbital Grinder (Both Pin & Journal Grinding) & CNC Thread Grinder / CNC Vertical Lathe / CNC Hard Turning)

FIBRO INDIA PRECISION PRODUCTS PRIVATE LIMITED

Plot No. A55, Phase II, Chakan, MIDC, TalukaKhed, Pune-410501,Maharashtra (Manufacturer - Rotary Indexing Tables,

Diesets, Standard Parts for Die & Mould Making)

FALCON TOOLINGS

SF.No. 205/1&2, Kuttaithottam, Kalapatti, Coimbatore - 641048, Tamil Nadu (Manufacturer - CNC Tool Holding Systems & Boring Bars & Accessories)

FLUIDTHERM TECHNOLOGY PRIVATE LIMITED

SP 132, III Main Road, Ambattur Industrial Estate, Chennai - 600 058, Tamil Nadu (Manufacturer - Industrial Furnace, Furnace for Powder Metallurgy and All Types of Heat Treatment Furnace Allied Equipments)

FLOWMECH ENGINEERS PRIVATE LIMITED

C-196/2, 2nd Floor, Mayapuri Industrial Area, Phase II, New Delhi - 110064, New Delhi (Manufacturer - Hydraulic Presses, Other Presses & Machinery)

IONBOND COATINGS PRIVATE LIMITED

F-II, Block Plot No 48, MIDC Pimpri, Pune - 411 018, Maharashtra (Manufacturer - PVD Coatings on Cutting Tools, Dies & Moulds, Auto & Industrial Components, Medical Instruments & Implants)

LVD STRIPPIT INDIA PRIVATE LIMITED

#310, 8th Cross, Fourth Phase Peenya Industrial Area, Bangalore - 560058, Karnataka (Distributor - Laser Systems, Press Brakes & Shears, Punch Presses,)

MODSONIC INSTRUMENTS MFG. CO. PRIVATE LIMITED

Plot No. 33, Phase III, GIDC, Naroda, Ahmedabad - 382330, Gujarat (Manufacturer - Ultrasonic Flaw Detectors, Ultrasonic Thickness Gauges, Ultrasonic Probes, Cables)

NIKITA DISTRIBUTORS

FL - 1B, 410/2, Green Terrace, Lane No 5, South Koregaon Park, Pune - 411 001, Maharashtra (Importer of Machine Tools - LED Lenses LED Lights, Leatherman Multi Tools, Stanley Padlocks, NT Cutters and Hand Tools)

NBR ENGINEERING PRIVATE LIMITED

1231 / 72, 1st Main Road, MRCR Industrial Layout, Vijayanagar, Bangalore - 560 040, Karnataka (Manufacturer - Precision Ground Ball Screws, Ground Lead Screws)

NEW MEMBERS ENROLLED IN 2014 - 15

OPEN MIND CADCAM TECHNOLOGIES INDIA PRIVATE LIMITED

3C - 201, 2nd Floor, 2nd Main Road, Kasturi Nagar, Bangalore - 560043, Karnataka (Manufacturer - HyperMill CADCAM Software)

PMS ENGINEERS

Hansa Pratik, #162, 2nd Floor, Gandhinagar 6th Cross, Bangalore - 560 009, Karnataka (Distributor - Bearings & Allied Products, Welding Machines,)

ROLLMANN TRADING COMPANY

No. 49/1, Shankarmutt Road, Shankarpuram, Bangalore - 56004, Karnataka (Distributor - Ball Screw, Ball Spline, Split Roller Bearings & LM Guide)

RUDRALI HI-TECH TOOLS PRIVATE LIMITED

E-94, MIDC, Akkalkot Road, Solapur - 413006, Maharashtra (Manufacturer - All type of CBN and PCD insert, Standard PCD reamer, Standard PCD and CBN End Mill, PCD and CBN special Tools)

RADIUS ENGINEERING SOLUTIONS PRIVATELIMITED

No. 21, 17th Cross, Doddanna Industrial Estate, Near Peenya 2nd Stage, Bangalore - 560 091, Karnataka (Manufacturer- Pellet Die Gundrilling Machine, Hydraulic Coil Spreading Machine, CNC Gundrilling Machine, Spindle Gundrilling Machines)

ROYAL TECH ENGINEERS

70. IDC, Mehrauli Road, Gurgaon - 122007, Haryana (Manufacturer - Parts & Accessories for Machine tools, Mfg. Caster Wheel & Trolley Wheels)

SPAN ASSOCIATES

Tarkar Products Compound, Hadapsar Industrial Estate, Pune - 411 013, Maharashtra (Manufacturer - Cleaning & Finishing Machines, Oil Cooling Units, Centralised Systems)

S. M. SYSTEMS PRIVATE LIMITED

A-297, Road No. 16-Z, Near Kamgar Hospital Bus Stop, Wagle Estate, Thane-400604, Maharashtra (Manufacturer - Vibro Finishing Systems, Disc Finishing Systems, Standalone Vibrators, Centrifugal Finishing Machines, Mass Finishing Systems, Finishing Chemicals & Media)

SCHENCK ROTEC INDIA LIMITED

A-5, Sector -81, Phase - II, Noida - 201 305, Uttar Pradesh (Manufacturer - Dynamic Balancing Machine, Cleaning Machine, Vibration Monitoring Equipment, Dynamometer, Spares)

TUNGALOY INDIA PRIVATE LIMITED

Unit # 13, B Wing, 8th Floor, Kamala Mills Compound, Trade World, Lower Parel (West), Mumbai - 400013, Maharashtra (Distributor - CVD Coated Grade, Tungdrill Twisted, Shoulder Miller Cutter, Tungsix-Drill, Super High Feed Milling Cutter)

TEKCEL ENGINEERING PRIVATE LIMITED

B-212, 5th Main Road, Peenya Industrial Area, Bangalore - 560 058, Karnataka (Manufacturer - Special Purpose Machine, Reconditioning & Retrofitting of CNC & PLC Controlled Machines)

Total Membership of IMTMA as on June 2015: 497 members





IMTMA Initiatives







Jyoti CNC scouting for new facility in South India; aims to invest Rs 100 cr





Indian Machine Tool Manufacturers' Association

9



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Indian Machine Tool Manufacturers' Association

www.imtma.in