

The Science of Making...



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VOLUME 1

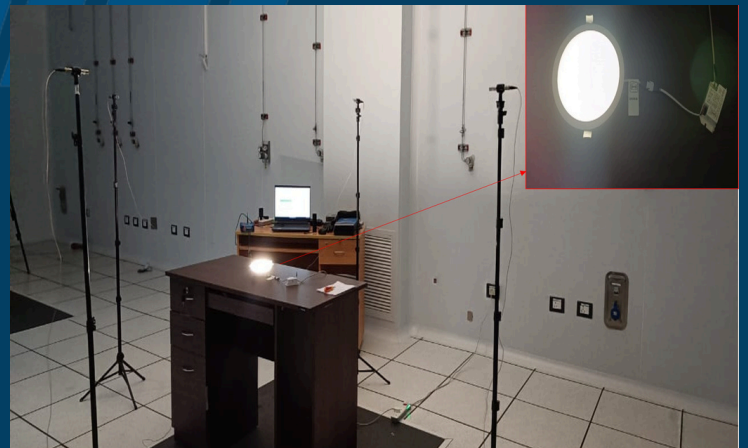
ISSUE 1

● DECEMBER 2024

TECHNICAL ACHIEVEMENTS

»» NOISE LEVEL MEASUREMENT OF LED DRIVER

The team from the Noise and Vibration Lab at C-SMPM has successfully completed the LED Driver Noise Testing for one of the customers of CMTI. This test aimed to measure the extremely low noise levels generated by the LED Drivers. The test was conducted in a specially designed quiet room with minimal background noise. During the test, sound pressure levels were measured at multiple locations around the Device Under Test (DUT) simultaneously using ICP microphones and a data acquisition system.



Care was taken to ensure that the data acquisition system was kept at a distance from the DUT during the measurements. This testing will enable the customer to benchmark their products against competitors, helping them make their LED drivers quieter and more competitive in the market.

AWARDS/RECOGNITIONS

»» CMTI RECEIVES THE 'CII WOMEN EXCELLENCE IN STEM AWARD – 2024'

On November 19, 2024, CMTI was honored with the prestigious 'CII Women Excellence in STEM Award – 2024'. The Director, along with senior women colleagues, received the award during the ceremony held in New Delhi.



CMTI extends heartfelt congratulations to all its staff members, with special recognition to its women staff for this remarkable achievement.

RESEARCH PAPER PRESENTATION/CONTRIBUTORY TALKS

»» INVITED LECTURE AT B.M.S. COLLEGE OF ENGINEERING, BENGALURU

Dr. Debeshi Dutta, Scientist-C at C-MNTM, delivered an insightful invited lecture on November 22, 2024, at B.M.S. College of Engineering, Bangalore, addressing students and faculty from the Department of Medical Electronics & Engineering. The lecture focused on leveraging AI and IoT protocols for real-time healthcare monitoring using wearable devices, shedding light on the current advancements and future prospects in smart healthcare systems.

Dr. Dutta's engaging session not only enhanced the audience's understanding of this cutting-edge field but also sparked interest among students regarding the facilities and opportunities at CMTI. Many students expressed enthusiasm for pursuing internships and project work at the institute, showcasing the impact of the talk on inspiring future innovators.



»» GUEST LECTURE AT "CSIR-CENTRAL SCIENTIFIC INSTRUMENTS ORGANISATION, CHANDIGARH"

On November 26, 2024, K. Manjunath (Scientist-B, C-MNTM) delivered a guest lecture on "Empowering Manufacturing with Finite Element Method (FEM): Applications and Insights" at a workshop on Advanced Engineering Simulations organized by CSIR-Central Scientific Instruments Organisation, Chandigarh.

PRESENTATION ON “SMART MANUFACTURING & INDUSTRY 4.0” AT THE INTERNATIONAL ENGINEERING SOURCING SHOW

On November 27, 2024, Shri T. Narendra Reddy (Scientist-D and Group Head, G-SMC, C-SMPM) delivered a presentation on "Smart Manufacturing & Industry 4.0" during the session titled "Automation & Smart Manufacturing for MSME Sector" at the XIIth edition of the International Engineering Sourcing Show held at the Chennai Trade Centre.



EVENTS/ WORKSHOPS ATTENDED

EVENT ON “LABS FOR GREENER TOMORROW: INNOVATING FOR SUSTAINABILITY AND CLIMATE ACTION”

On November 26, 2024, Dr. Nagahanumaiah, Director of CMTI, delivered a keynote address at an event titled "Labs for Greener Tomorrow: Innovating for Sustainability and Climate Action", organized in collaboration with BIS at the CII-IQ campus, Magadi Road, Bengaluru. The event aimed to unite stakeholders from the laboratory sector to discuss the significance of sustainability, share best practices, and explore collaborative strategies for fostering a sustainable and climate-resilient future.

A team of scientists from CMTI, including Mr. Deepak Singh D, Mr. Manjunath B N, Mr. Manjunath M A, Mr. Murugan A, and Dr. Debeshi Dutta (all Scientist-C), participated in the event. They attended informative sessions and expert discussions, gaining valuable insights to drive sustainability initiatives within laboratories and contribute to the broader goal of climate resilience. The event highlighted the pivotal role of laboratories in innovating for sustainability and advancing climate action efforts.



VISIT TO M/S SYNTHESIS WINDING TECHNOLOGIES PVT. LTD & M/S ZETTA WATT PVT. LTD.

As part of the industry-accelerator project titled "Development of BLDC Coil Winding Machine with the Total Test Bench and Automation for Manufacturing", Mr. Ramesh B. (Scientist-C) and Mr. Setti Suresh (Scientist-B) from C-SMPM, along with Project Engineers, visited the machine development and assembly facility at M/s Synthesis Winding Technologies Pvt. Ltd on November 27, 2024. During the visit, they discussed challenges encountered during the assembly process. The assembled machine was demonstrated by the staff from Synthesis, and the events (data logs) used for calculating the Overall Equipment Effectiveness (OEE) were recorded.



SKILL DEVELOPMENT PROGRAM

On November 20, 2024, a skill development program on “Smart Manufacturing Systems and Industry 4.0/5.0” was organized for the participants from the Hindustan Aeronautics Limited (HAL), Bengaluru. This program focused on equipping participants with knowledge and skills in advanced manufacturing technologies and concepts related to Industry 4.0 and 5.0, emphasizing the role of smart systems in manufacturing processes.



➤➤ TRAINING ON “ADVANCED MATERIALS CHARACTERIZATION TECHNIQUES”

A training programme on "Advanced Materials Characterization Techniques" was coordinated by Mr. Murugan A (Scientist-C) from November 18-21, 2024 with participants from CSIR-Central Glass and Ceramic Research Institute, Kolkata and ANVL Institute of Learning, Avadi, Chennai. The program covered topics such as mechanical characterization, confocal microscopy, Raman and FTIR spectroscopy, ellipsometry, X-ray diffraction, scanning probe microscopy, surface area analysis, scanning electron microscopy, and sample



preparation for electron microscopy. Each day included lectures by experts, hands-on demonstrations, and sessions for techniques like STM, AFM, and rheometer analysis, thus enriching the participants with a comprehensive understanding of advanced materials characterization methods.

➤➤ TRAINING ON “INTRODUCTION TO COORDINATE METROLOGY”



A training Programme on "Introduction to Co-ordinate Metrology (CMM)" was organized from November 20-22, 2024 with participants from Collins Aerospace, Bengaluru, Toyota Kirloskar Auto Parts Pvt. Ltd., Bidadi, National Skill Training Institute, Hyderabad, and Brahmos Aerospace Pvt. Ltd., Mumbai. Coordinated by Siddaraju K G (Senior Technical Assistant – I), the program featured expert-led sessions on topics such as the

basics of coordinate metrology, probing systems, elements of CMM, GD&T (Geometric Dimensioning and Tolerancing), alignment methods, and laser tracking. Participants were engaged in practical exercises, including workpiece alignment, CAD-based measurements, CNC programming, and advanced laser trackers and F25 systems demonstrations. The event also included lab visits, ensuring a comprehensive and interactive learning experience.

»» TRAINING ON “GEAR ENGINEERING”

A training programme on "Gear Engineering" was organized from November 19-20, 2024 with participants Rajmane Industries Pvt. Ltd., Bengaluru, Opto Electronics Factory, Dehradun, 515 Army Base Workshop, Bengaluru, and CQA(BEML)/DGQA (MoD), Bengaluru. The program, coordinated by Mr. Ananthapadmanabha K M (Scientist-E), featured sessions on gear types, classification, applications, design standards, and the design of spur, helical, and worm gears. It also covered material selection, heat treatment, and gear correction methods. Practical demonstrations included Kisssoft (gear module), gear manufacturing, quality assurance, and gearbox maintenance. The participants also visited the metrology lab and gear manufacturing unit for hands-on experience.



»» TRAINING ON “INDUSTRY 4.0 & SMART MANUFACTURING SYSTEM”

A training program on "Industry 4.0 & Smart Manufacturing Systems" was coordinated by Mr. Narendra Reddy (Scientist-D & GH, G-SMC, C-SMPM) from November 20 to 22, 2024, with 24 participants from M/s Hindustan Aeronautics Ltd. The program covered diverse topics, including an introduction to Industry 4.0, IIoT, AI/ML applications in manufacturing, digitization of legacy machines, machine-to-machine connectivity, industrial communication protocols, and reverse engineering. Participants also engaged in demonstrations on IIoT implementation, smart metrology, data acquisition, and condition monitoring of machines. The sessions included advanced topics such as autonomous mobile robots, PLC automation, RFID applications, vision systems, and digital twin technology. Practical sessions included hands-on training in vibration measurement, frequency domain analysis, sensor selection, and data interpretation for condition monitoring. The program concluded with lab visits and a session on collaborative robotics, followed by certificate distribution.



»» TRAINING ON “LABORATORY MANAGEMENT & INTERNAL AUDIT AS PER ISO /IEC 17025:2017”

A training program on "Laboratory Management & Internal Audit as per ISO/IEC 17025:2017" was conducted from November 25 to 28, 2024, with 36 professionals from various industries. The program, co-ordinated by Mrs. Khushboo (Scientist-D and GH, G-PM, C-SMPM), commenced with an introduction to laboratory accreditation, covering international perspectives and ISO/IEC 17025:2017 standards, including terms, definitions, general requirements, and structural requirements. Detailed sessions addressed resource requirements such as personnel, facilities, environmental conditions, equipment, metrological traceability, and externally provided products and services. The training also focused on the process requirements, including reviewing requests, validation methods, sampling, technical records, complaints, information management, etc., followed by practical exercises on the same topics. The participants were also briefed about the adequacy of quality manual, internal audit policies, development of procedures, uncertainty of measurement, and so on. The session concluded with the participants' evaluation, followed by insight into NABL accreditation. This comprehensive program aimed to enhance participants' understanding and application of laboratory management and auditing standards.



PUBLICATIONS

1. A.R. Vinod, N. Balashanmugam and N. Venkaiah, "Additive Manufacturing of Inconel 625 on Ti6Al4V using Molybdenum interlayer through Directed Energy Deposition process", International Conference on Next Generation Technologies: Design and Manufacturing (ICNGT) 2024, IIT Madras, 13-15 November 2024.
2. Anusha Epparla, Gerd Toberling, Frank Riedel, S M Shariff, "Influence of substrate pre-heating and laser wavelength on laser metal deposition of copper", International Conference on Next Generation Technologies: Design and Manufacturing (ICNGT) 2024, IIT Madras, 13-15 November 2024.

DEMONSTRATION/ VISITS AT CMTI

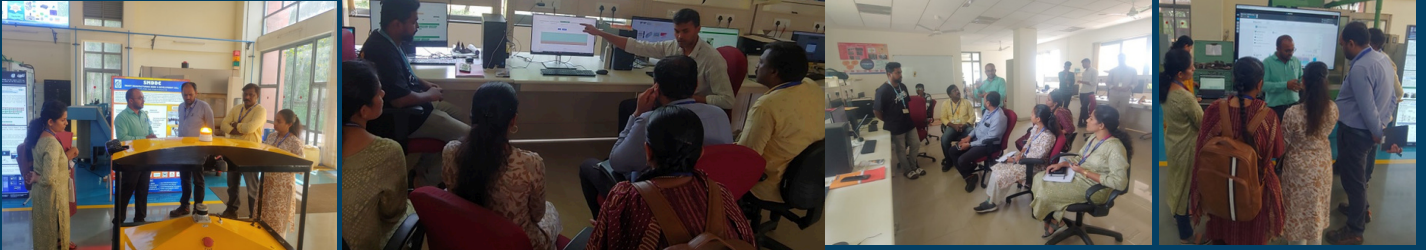
▶▶▶ LPSC TEAM VISITS CMTI

A team of scientists comprising Mr. Prakash M.N., Mr. Joby V. Thomas, and Mr. Sandeep Kumar from the Liquid Propulsion Systems Centre (LPSC) / ISRO, Thiruvananthapuram, visited CMTI on November 13, 2024. The purpose of their visit was to explore potential opportunities for collaboration in the field of Additive Manufacturing.

▶▶▶ SMDDC DEMO TO HINDUSTAN MACHINE TOOL AND AIRBUS INDIA PVT LTD.

On November 19 and November 25, 2024, teams from Hindustan Machine Tools (HMT) and Airbus India Pvt. Ltd., respectively, visited the Smart Manufacturing Demo and Development Cell (SMDDC) at CMTI. During the visit, the SMC team provided an overview of the SMDDC's activities and showcased various use cases developed within the cell. The SMC group highlighted the advanced capabilities and innovations built on smart manufacturing technologies developed at CMTI, demonstrating their practical applications and technological advancements.

The teams also visited the HAL-CMTI experimental learning labs to explore how the smart factory technologies are facilitated at CMTI. The visit highlighted how these advancements support MSMEs in adopting and benefiting from Industry 4.0 technologies.



EVENTS/CELEBRATIONS

▶▶▶ OBSERVANCE OF THE CONSTITUTION DAY OF INDIA

On November 26, 2024, CMTI observed the Constitution Day of India by reading the Preamble. The members of CMTI came together to commemorate the adoption of the Constitution of India by the Constituent Assembly, reflecting on its significance and the values it upholds.



»» KANNADA RAJYOTSAVA CELEBRATION

CMTI celebrated the 69th Karnataka Rajyotsava and the institute's 39th Rajyotsava event on 28 November 2024 with great enthusiasm and cultural fervor. The day began with the raising of the Karnataka flag by the honorable Director of CMTI, in the presence of all CMTI members, followed by a melodious inaugural song. The event was graced by Shri Matturu Subbanna, a renowned Kannada writer, and Shri Raghavendra Acharya, a well-known Kannada stand-up comedian, as Chief Guests. Director, CMTI, presided over the function, which was inaugurated with the ceremonial lighting of the lamp by the Chief Guests.

As part of the celebrations, various cultural and sports competitions were organized, and prizes were distributed by the Chief Guests to the winning participants. The institute arranged a traditional Karnataka lunch for all employees and their families who attended the event. The celebration also featured captivating cultural performances by CMTI employees, including dances, skits, and singing. Children of employees added charm to the event with their mesmerizing dance performances, making the day memorable for everyone.





SUPERANNUATION

Mrs. Asha R. Upadhyaya, Joint Director and Group Head of Purchase & Stores, Centre Head of AEAMT, retired on October 31, 2024, after an illustrious career spanning 33 years at CMTI. In recognition of her dedication and perseverance, CMTI organized a heartfelt felicitation event to honor her invaluable contributions to the institute. The event celebrated her remarkable journey and her steadfast commitment to the growth and success of CMTI.



UPCOMING TRAININGS

1. "Laser Micro Machining", Course Code: 0315, on January 20, 2025, at CMTI, Bengaluru.
2. "Heat Treatment in Manufacturing Technology", Course Code: 0920, from January 20-21, 2025, at CMTI, Bengaluru.



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