



# The Science of Making...



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## TECHNICAL ACHIEVEMENTS

### »» CMTI OFFICIALS RECEIVED THE NDT LEVEL-II CERTIFICATE IN PHASED ARRAY ULTRASONIC TESTING (PAUT)



Mr. Champuri Srinivasa Rao, Scientist - D and Mr. Satish Pattar, Senior Technical Assistant – I have successfully completed the NDT Level II certification course for Phased Array Ultrasonic Testing (PAUT) in line with SNT-TC-1A / 2020 standards during 02.12.2024 to 07.12.2024 at M/s Thamizh NDT Consultancy, Thiruchirapalli.



Phased Array Ultrasonic Testing (PAUT) is an advanced non-destructive examination technique that uses ultrasonic probes capable of pulsing elements individually at different time intervals. Compared to conventional ultrasonics, PAUT provides higher probability of detection, faster, more reliable.

This test also provides 2D images together with 3D projection information and a permanent record of the inspection through the data recorded. The PAUT certification signifies their skill in advanced inspection methods, ensuring the highest levels of safety and quality in all our research and development projects.. This marks a significant milestone in their pursuit of excellence in non-destructive testing (NDT) techniques.

## RESEARCH PAPER PRESENTATION/CONTRIBUTORY TALKS

A research paper titled "Optimization of Micro-Tesla Valve as a Passive Mixer in Microfluidic Channels: Design and Experimentation," authored by Deepak Singh D, M.S. Srinivas, S. Purushothaman, M.R. Sankar, and Nagahanumaiah, was presented at the 13th International Conference on Precision, Micro, Meso, and Nano Engineering, held at NIT Calicut.



## WORKSHOPS\TRAININGS\VISITS

- ✦ Dr. Nagahanumaiah, Director, Mr. Arun Kumar J.G., Jt. Director, and other Group heads and Scientists of CMTI, visited M/s BrahMos Aerospace in Trivandrum on 9 December 2024 to explore potential collaboration opportunities between the two organizations. During the visit, CMTI team presented CMTI's capabilities in the areas of design and development of special-purpose machines, test rigs,, vision technologies, additive manufacturing etc. and the M/s BrahMos Aerospace expressed interest in collaborating with CMTI.
- ✦ Dr. Ashish Varade, Scientist-D underwent a DST sponsored training program on "Technology Innovation and IP Management" at C-DAC, Mohali organized from December 9 to 13, 2024, which addressed advanced topics on IP auditing, IP management, IP evaluation, licencing negotiation and current challenges faced by new technologies such AI and blockchain.
- ✦ Dr. Kavithaa. S, Scientist-E served delivered a invited talk on "Materials & Processes for energy sector applications" in the AICTE-ATAL sponsored 'Faculty Development Program on Green Materials & Methodology' for sustainable development at Mohamed Sathak A.J. College of Engineering
- ✦ A.R. Vinod, Scientist-D, attended a workshop on "Industrial Additive Manufacturing using Metal 3D Printing," organized by the Cambridge Institute of Technology, Bengaluru, in association with EOS GmbH, India, and Galactic 3D Pvt. Ltd. on 17 December 2024. The workshop addressed topics related to metal additive manufacturing for strategic sectors, with a focus on India's growing defense and space missions. It also emphasized the potential for industry-academic collaborations and the challenges in these fields.
- ✦ CMTI scientists, Shri Mohanraj B.R., Joint Director, Mr. Pavan N., Scientist D, Mr. Raghu Kodi, Scientist D, and Mr. Saravanan K., Scientist C, visited M/s CSIR-NAL on 18 December 2024. The visit focused on 3D weaving technologies and machines developed at CSIR-NAL. The team was briefed on 3D weaving technologies and the associated R&D opportunities at CSIR-NAL.
- ✦ CMTI Scientists Mr. Shanmugaraj V., Joint Director, Mr. Raghu Kodi, Scientist D, Mrs. Shruthi G., Scientist D, and Mr. Saravanan K., Scientist C, visited M/s Sashwat Looms in Coimbatore on 23 December 2024. The visit focused on development of Air Ket Loom machinery. Shri Prem Nandagopal, proprietor of M/s Sashwat Looms, briefed the team on the air jet looms requirements, and their attempts. He also emphasized the importance of indigenous technology development for import substitution.
- ✦ A team of four, scientists from Smart Manufacturing Cell at SMPM, visited the TTI division of HAL, Bangalore on 30 December 2024 to study the feasibility of converting the existing workshop into smart workshop by deploying the practices of industry 4.0.
- ✦ A team of scientists from the PDE Group successfully completed 4 sessions of the NAFEMS training e-learning course on 'Simulation of Lubricated Contacts.'

◆ Dr. Ajay Jaswal, Scientist-B STDDC, C-SVT, has completed the Semiconductor Fabrication 101 course on December 27, 2024, sponsored by Purdue University, University of Texas at Austin, and Intel Corporation. This course featured comprehensive and engaging lectures covering a variety of industry-standard semiconductor fabrication processes. It also included hands-on training through the vFabLab and video tutorials demonstrating actual equipment and process technologies.



## TRAINING INITIATIVES

### EXCLUSIVE TRAINING PROGRAM ON SMART MANUFACTURING AND INDUSTRY 4.0 AT CMTI

From 16 to 18 December 2024, CMTI conducted an exclusive training program on Smart Manufacturing and Industry 4.0 for 22 employees from Hindustan Aeronautics Limited (HAL), along with representatives from several distinguished organizations, including Bharath Dynamics Limited, 515 Army Base Workshops, Surface Finishing Equipment Co., Actalent Services Private Limited, and the Naval Armament Inspectorate, Trivandrum. The program, coordinated by Mr. Narendra Reddy, Scientist-D at C-SMPM, aimed to provide the participants with a deep understanding of the latest Industry 4.0 concepts and how they can be applied in manufacturing. The key highlights of the training program included in-depth discussion on Industry 4.0 technologies, including IoT, automation, data analytics, AI, and robotics, emphasizing the role of smart manufacturing technologies in enhancing productivity, efficiency, and global competitiveness. During the program, Mr. Narendra Reddy provided a detailed overview of the activities at the Smart Manufacturing Demo and Development Cell (SMDDC). The participants were shown real-world use cases developed within the Smart Manufacturing Cell at CMTI, highlighting the practical applications of Industry 4.0 technologies in improving manufacturing efficiency and quality. The training included a visit to the SMDDC and the HAL-CMTI experimental learning labs, where participants had the opportunity to explore how smart factory technologies are implemented in a controlled environment. They learned how these cutting-edge solutions are designed to benefit MSMEs by enabling cost-effective, scalable, and sustainable manufacturing practices.



## BUSINESS INITIATIVES/MOU

CMTI and ELCIA (Electronics City Industries Association) signed an MoU to develop Indigenous sensors for industrial requirements



CMTI and M/s HTL Co. Pvt. Limited Bengaluru signed an MoU to jointly work on R&D in Design and Manufacturing Engineering, Micromachining, Green manufacturing, Industrial ergonomics, and other advanced manufacturing technology areas.



## WELCOMING 2025

The year 2024 has been remarkable for CMTI, marked by significant milestones and achievements. We began the year on a high note by securing four patent grants in the first quarter, and we concluded it with the honor of receiving two prestigious CII awards in the final quarter. Throughout the year, we welcomed new customers, strengthened our network, and deepened our commitment to innovation. In collaboration with our industry partners, we successfully developed several cutting-edge machines and aggregates, demonstrating the power of teamwork. Additionally, we launched the newsletter "The Science of Making," which published 16 issues that highlighted our key achievements and milestones while recognizing the efforts of all CMTI team members. These accomplishments reflect the exceptional talent, resilience, and dedication of our team. We extend our heartfelt gratitude to our stakeholders for their steadfast support and encouragement throughout this journey.

As we look ahead to 2025, let us build on this momentum and strive for even greater accomplishments. The upcoming year promises exciting opportunities through new projects, transformative collaborations, and key milestones that will solidify our leadership in manufacturing science and technology. Together, we will continue to push boundaries and reach new heights.

\*\*\* Wishing you and your families a joyful, successful, and rewarding New Year in 2025! \*\*\*

\*\*\*We wish to meet you at IMTEX 2025, Stall No. 103, Hall 2B, from 23 to 29 January 2025 in Bengaluru and witness the demonstration of our recent innovations\*\*\*

Air Bearing Rotary Stage | DED AM Machine | AOI Machine for PCB Inspection | INTELLIPOD | MTCM Edge Module | Servo Press | Motor Stator Winding Machine | Laser Polishing Machine | Ball Screw | Temperature Sensor | Mass Flow Controller | Universal Controller | Moopedo Device Cattle Lameness\*



## UPCOMING TRAINING PROGRAMMES

- ◆ "Laser Micro Machining", course code 0315 conducting a 01 day Non-Residential Training programme on January 20, 2025.
- ◆ "Heat Treatment in Manufacturing Technology", course code 0920 conducting a 02 days Non-Residential Training programme From 20th-21st January 2025.
- ◆ "Scanning Electron Microscopy", conducting a 01-day Non-Residential Training programme on February 13, 2025.



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