





The Science OF MAKING...

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TECHNICAL ACHIEVEMENTS

INDIGENOUS HIGH-TEMPERATURE ENDURANCE TEST FACILITY FOR AIRCRAFT INWARD/OUTWARD RELIEF VALVES (IORVS)



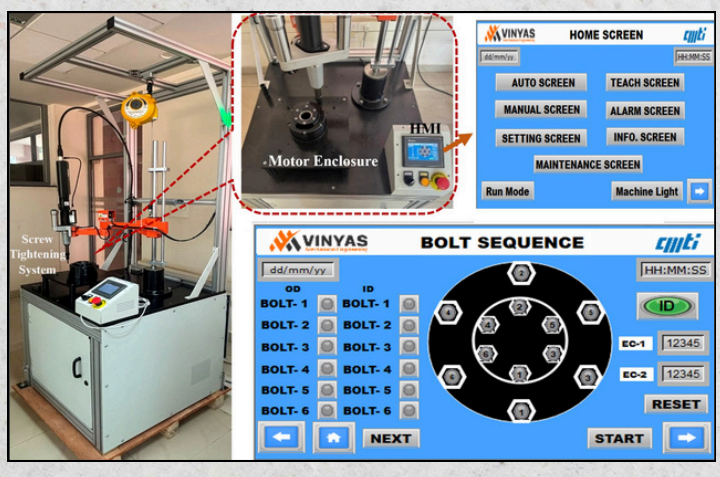


The Aerospace Laboratory of C-ASMP, CMTI has developed an indigenous, fully automated High-Temperature Endurance Test Facility for the qualification and endurance testing of Aircraft Inward/Outward Relief Valves (IORVs) used in aircraft fuel tank venting systems. The facility accurately simulates aircraft operating conditions by generating controlled airflow exceeding 2.5 kg/min (approximately 2,100 LPM) at pressures up to 10 bar and air temperatures above 120°C. It enables reliable qualification and long-duration endurance testing of aerospace pneumatic components under representative service conditions.

The system integrates a high-temperature air generation unit, automated pneumatic control, closed-loop regulation of airflow, pressure, and temperature, precision instrumentation, and comprehensive safety interlocks to ensure stable, repeatable, and safe operation throughout extended test cycles. Additionally, a dedicated Control and Data Acquisition (DAQ) system automates test execution, real-time monitoring, data logging, and alarm management, ensuring complete traceability, repeatability, and compliance with aerospace qualification requirements.

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INDIGENOUS DEVELOPMENT OF A SEMI-AUTOMATED MOTOR ASSEMBLY MACHINE FOR BOLT TIGHTENING AND LOOSENING



As part of the Industry Accelerator scheme, under the Ministry of Heavy Industries, Government of India, the Smart Manufacturing Cell of C-SMPM, CMTI, in collaboration with M/s Vinyas Mechanical Engineering Pvt. Ltd, developed an indigenous motor assembly machine as part of the BLDC motor manufacturing production line. The machine features a semi-automated screw/bolt tightening system equipped with a Bosch Rexroth CS351S-D controller offering a torque range of 15-150 N-m. It utilizes feedback from two rotary encoders (base and arm axes) to achieve accurate positioning and repeatable operation through an interactive Human–Machine Interface (HMI). Further, the bolt sequencing is made fault-tolerant with respect to power loss by leveraging the retentive memory of the PLC. The machine is intended for the precision assembly of electric hub motor casings.

PUBLICATIONS

Setti Suresh, Mohana Priya P V, T Narendra Reddy, Prakash Vinod, “Automated I-V Tracer Circuit for Inspection of Bypass Diodes in Photovoltaic Module”, 2026 IEEE International Power and Renewable Energy Conference (IPRECON 2026), September 04-06, 2026 | College of Engineering Karunagappally, Kerala, India [Accepted].

AWARDS/RECOGNITIONS

CMTI SCIENTIST HONOURED WITH IEI YOUNG ENGINEER AWARD 2025



Dr. Tapas Debnath, Sct-C, Aerospace Laboratory, C-ASMP, has been awarded the prestigious IEI Young Engineer Award 2025 in Production Engineering by The Institution of Engineers (India), recognizing his excellence and noteworthy contributions to the discipline. The award was presented during the 40th National Convention of Production Engineers and National Seminar on Sustainable Smart Manufacturing for Circular Economy, organized by The Institution of Engineers (India), Coimbatore Local Centre, in association with the Department of Production Engineering, PSG College of Technology, Coimbatore. During the event, he also served as an expert panellist in a panel discussion on emerging trends, challenges, and opportunities in sustainable manufacturing, circular economy, digital transformation, and the future of production engineering. CMTI congratulates him on this noteworthy achievement and his valuable contribution to advancing discussions on next-generation manufacturing technologies.

MOU/NDA

- CMTI and Siddi Sai Internationals executed a Quality Technical Agreement on 3 July 2026 to facilitate particle characterization in finished products.
- CMTI and Eaton India Innovation Centre LLP executed an NDA on 8 July 2026 to establish a framework for collaboration in testing services.
- CMTI and Larsen & Toubro Limited (L&T) executed an NDA on 8 July 2026 to facilitate collaboration on the design, development, and integration of Fuel Test Rigs for the Advanced Medium Combat Aircraft (AMCA) programme.
- M/s E.G.S. Pillay Engineering College, Nagapattinam, Tamil Nadu, signed a CAAP Membership Agreement with CMTI o 14 July 2026.

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EVENTS/ EXHIBITIONS ATTENDED

CMTI SHOWCASES ADVANCED MANUFACTURING TECHNOLOGIES AND FACILITIES AT MOGEN EXPO 2026






CMTI actively participated in MoGen Expo 2026, organized by Aldrich Corporation Pvt. Ltd., held from 8–10 July 2026 at the KTPO Exhibition Centre, Whitefield, Bengaluru. The event showcased the cutting-edge technologies driving the future of power, motion, and energy resilience, bringing together leading manufacturers, innovators, and industry professionals from across the sector to explore emerging trends and opportunities. The CMTI delegation, comprising Mr. Tom Thampy, Mr. Raghu Kodi, Mrs. Shruthi G., Mr. Bishnu Prasad Sahu, Mr. Mayank Patel, Mr. Emmanuel Gospel Raj R., and Mr. Prakash Devadiga, showcased CMTI's technologies, research capabilities, and state-of-the-art facilities to industry stakeholders and visitors. Mr. Tom Thampy, Sct-E and Group Head, Aerospace Laboratory, served as a Technical Committee Member for MOGEN Expo 2026. He also participated as an expert panellist in the technical session titled "Electrification Beyond the Grid: Shaping the Future of Energy Storage", sharing the stage with Dr. Satya Dubey (Head – Global Battery Expert (R&D), Volvo), Mr. Saurav Mitra (Director – Energy Storage Business, Sumitomo), and Mr. Ashim Roy (Project Lead – Energy Finance, World Resources Institute (WRI)). The session was moderated by Mr. Ramesh Singh, Senior Principal Manager, Tata Elxsi.







During the discussion, Mr. Tom Thampy highlighted the successful global examples of energy storage enabling cost-effective electrification without major grid expansion. He also shared perspectives on India's roadmap for developing indigenous energy storage manufacturing capabilities and the critical technology gaps that must be addressed to establish global competitiveness in advanced energy storage systems.

Mr. Mayank Patel, Sct-B, contributed to the panel discussion by highlighting his perspectives on “Electric Vehicle Range Estimation Using Machine Learning-Based Data-Driven Regression Techniques”.

CMTI's participation at MOGEN Expo 2026 provided a valuable platform to demonstrate its technological expertise, engage with leading industry professionals, and strengthen collaborations in the fields of advanced manufacturing.

INDIGENOUS DRONE MOTOR WINDING TECHNOLOGY SHOWCASED AT MOGEN EXPO 2026

At the MoGen Expo 2026, CMTI's industry partner, M/s Zetta Watt Pvt. Ltd., showcased a Single-Station Drone Motor Winding Machine (DMW), designed for the production of miniature, high-speed outrunner motors for drone applications. Developed jointly by M/s Zetta Watt Pvt. Ltd. and CMTI under the Industry Accelerator Scheme of the Ministry of Heavy Industries (MHI), the machine represents a significant milestone in advancing indigenous manufacturing technologies through effective collaboration between industry and research institutions.





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CMTI TEAM PARTICIPATES IN SOLIDWORKS SEMINAR

CMTI team comprising Mr. Emmanuel R., Mr. Ankur Bhardwaj, Ms. Hemavathi V., Mr. Akshay Katariya, and Ms. Nandini S. P., participated in a SOLIDWORKS seminar on 14 July 2026 at BEACON, Bangalore. The seminar showcased advanced SOLIDWORKS modules, including, Composer, Visualize, Inspection, and Module-Based Definition (MBD), with a focus on technical documentation, photo-realistic rendering, automated quality inspection, and paperless 3D manufacturing workflows.

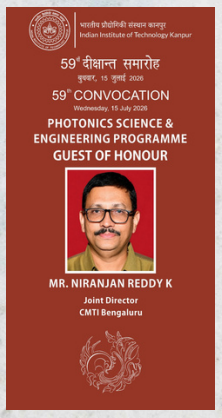


MR. K. NIRANJAN REDDY AT IIT KANPUR'S 59TH CONVOCATION









Mr. K. Niranjan Reddy attended the 59th Convocation Ceremony of IIT Kanpur on 15 July 2026 as the Guest of Honour for the Photonic Science & Engineering program. On the occasion, he delivered an address, inspiring the graduating students with his insights.

DEMONSTRATION/ VISITS AT CMTI

BHARAT FORGE PUNE VISIT TO CMTI'S SMART MANUFACTURING DEMO AND DEVELOPMENT CELL (SMDDC)

On 8 July 2026, a team from Bharat Forge, Pune visited the Smart Manufacturing Demo and Development Cell (SMDDC) at CMTI. The visit aimed to showcase the cutting-edge smart manufacturing technologies developed at CMTI and to demonstrate their potential in enhancing and transforming modern manufacturing processes. During the visit, Mr. Narendra Reddy, Sct-D and Group Head, Smart Manufacturing Cell, C-SMPM, briefed the delegates on the ongoing development activities at SMDDC. This was followed by live demonstrations by various project teams, highlighting CMTI's advancements in digital manufacturing, automation, and Industry 4.0 technologies, developed under the Samarth Udyog Bharat 4.0 scheme of the Ministry of Heavy Industries.





VISIT BY VDMA, OPC UA FOUNDATION PRESIDENT & SIEMENS R&D TEAM



On 8 July 2026, CMTI participated in the OPC Day – India 2026 at the BMS College of Engineering, Bengaluru, a forum focused on industrial interoperability and smart manufacturing. Dr. Nagahanumaih, Director, CMTI, delivered a keynote address on the deployment of Industry 4.0 technologies, highlighting practical industry implementations and the importance of scalable digital transformation. Mr Narendra Reddy, Scientist-D and Group Head, Smart Manufacturing Cell, C-SMPM, participated as a panellist in the session "OPC UA: Success Stories – India," sharing insights on the role of open standards and interoperability in connecting heterogeneous industrial systems and enabling future-ready smart manufacturing. On 9 July 2026, the VDMA, OPC UA Foundation President, and Siemens R&D Team visited CMTI. The visit was hosted by Dr. Nagahanumaiah, Director, CMTI, and Mr. Narendra Reddy, Group Head – Smart Manufacturing Cell (SMC). The team technologies can improve and transform modern manufacturing processes.was briefed on the smart manufacturing technologies developed at CMTI. The visit provided an opportunity to discuss how these

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TRAINING PROGRAMMES

EXCLUSIVE TRAINING PROGRAM ON “INDUSTRY 4.0 AND QUALITY 4.0” FOR DIQA EMPLOYEES






CMTI conducted a three-day exclusive training program on “Industry 4.0 and Quality 4.0” for 21 DIQA employees from 1-3 July, 2026. The sessions were coordinated by Mr. Harikrishna Sathish Tota (Sct-D), Mr. Suresh Setti (Sct-B), and the SMDDC team. The participants were introduced to key Industry 4.0 technologies, including Industrial IoT (IIoT), automation, artificial intelligence, data analytics, and robotics through technical sessions, live demonstrations of Industry 4.0 solutions, and visits to CMTI’s experiential learning laboratories. The program strengthened the participants’ understanding of Industry 4.0 technologies and their potential to enhance manufacturing efficiency, quality, and innovation, with a special emphasis on their relevance and applicability for MSMEs.

TRAINING PROGRAMME ON “CALIBRATION OF DIMENSIONAL MEASURING EQUIPMENT”



A five-day training programme on “Calibration of Dimensional Measuring Equipment” was coordinated by Mrs. Khushboo, Sct-D, from 6–10 July 2026. The programme, attended by 31 participants, provided comprehensive insights into dimensional metrology, calibration principles, UOM, calibration procedures, and quality system requirements as per ISO/IEC 17025. The participants gained hands-on exposure through live demonstrations and practical sessions on a wide range of precision measuring instruments, including vernier callipers, micrometers, dial gauges, gauge blocks, profile projectors, height gauges, slip gauges, universal length measuring machines, laser measurement systems, CMMs, surface plates, and form measurement standards. The training also included laboratory visits and practical demonstrations at CMTI’s advanced metrology facilities, enabling participants to understand the significance of calibration techniques in industrial measurement systems.

TRAINING PROGRAMME ON “GEOMETRIC DIMENSIONING & TOLERANCING”

CMTI conducted a five-day training programme on “Geometric Dimensioning & Tolerancing (GD&T)” from 6–10 July 2026, with 20 participants from various industries. Coordinated by Mr. Anil Kumar K., Sct-D, the training aimed to enhance participants’ understanding of GD&T principles and their applications in precision manufacturing and metrology. The sessions covered fundamental concepts of GD&T, precision measurements, datum referencing, form and positional tolerancing, tolerance stack-up analysis, and CMM applications. The programme included extensive hands-on demonstrations and laboratory visits, covering dimensional metrology, surface roughness measurement, measurement of form and profile tolerances, runout and cylindricity evaluation, and advanced CMM-based inspection techniques.



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TRAINING PROGRAMME ON “MICROSCOPY & ANALYSIS: SEM, AFM, STM, CONFOCAL MICROSCOPE, OPTICAL PROFILER, ETC.”



A three-day training programme on "Microscopy & Analysis: SEM, AFM, STM, Confocal Microscope, Optical Profiler, etc." was conducted by CMTI, from 8–10 July 2026. The programme, coordinated by Mr. Murugan A, Sct-D, combined expert lectures with hands-on demonstrations, offering participants practical exposure to advanced characterization tools such as SEM, AFM, STM, Raman and FTIR spectroscopy, confocal microscopy, optical profilometry, and metallurgical microscopy. Laboratory visits and live instrument demonstrations enriched the learning experience, helping the participants gain significant knowledge on sample preparation, imaging techniques, and materials analysis for applications across engineering, manufacturing, and scientific research.

UPCOMING TRAINING PROGRAMMES

1. Uncertainty of Measurements for Dimensional Measurements”,Course Code:4104, from 17 – 19 August 2026.
   Click for more information
2. “Part Programming of CNC Machine”, Course Code:6101, from 24 – 28 August 2026
   Click for more information
3. “Advanced Material Testing”, Course Code: 1306, from: 01 – 02 September 2026
   Click for more information
4. “Digital Signals Driving Micro-Manufacturing & automation – MATLAB & Python”, Course Code: 4204, from: 03 – 04 September 2026
   Click for more information

Editorial Team

Dr. Debeshi Dutta - 8670958202
Dr. Anusha Epparla - 7382413886
Ms. Pallavi M
write to us: directoroffice@cmti.res.in

Central Manufacturing Technology Institute
केंद्रीय विनिर्माणिकारी प्रौद्योगिकी संस्थान
ಕೇಂದ್ರ ಉತ್ಪಾದನಾ ತಂತ್ರಜ್ಞಾನ ಸಂಸ್ಥೆ
Tumkur Road, Bengaluru - 560022,
Karnataka, India Tel: +91-80-23372048
E-mail : director@cmti.res.in
Website : www.cmti.res.in