

The Science of Making...



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TECHNICAL ACHIVEMENTS

»» DEPLOYMENT OF HYDRAULIC LRU TESTING FACILITY AT HAL

Aerospace Laboratory, CMTI has successfully established a dedicated Hydraulic LRU Testing Facility at HAL, Tejas Division, Bengaluru. The state-of-the-art Hydraulic Second Line Test Rig was inaugurated on 24 April 2025 by Shri. Muhammed Abdul Salam, GM, HAL Tejas Division, in the presence of Shri. Ravindra Kumar, chief of projects (LCA-Tejas). This facility is a major boost to indigenous aerospace capability, enabling Pre-Installation (PI) checks, a critical part of Acceptance/Production Test Procedures for a wide range of hydraulic and electro-hydraulic LRUs

The test rig broadly comprises the following units:

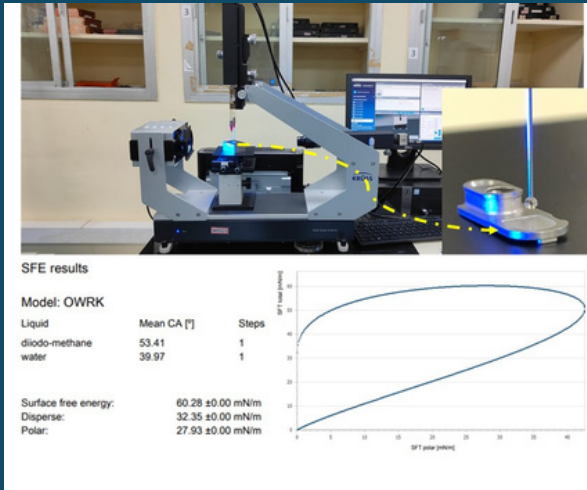
- Test Stand for Hydraulic Pumps and Electric Motor Driven Pumps (EMDP)
- Test Stand for Flight Control Actuators, Brake Manifolds, and Nose Wheel Steering Manifolds
- Universal Test Stand for Hydraulic Components and Landing Gear Assemblies
- Static Pressure Testing Stand





NEW INITIATIVES/SERVICES

ADVANCED SURFACE CHARACTERIZATION WITH DROP SHAPE ANALYZER



CMTI is thrilled to announce a significant enhancement in analytical services. C-MNTM expanded the capabilities of the Drop Shape Analyzer, now offering comprehensive surface free energy (SFE) calculations in addition to precise contact angle measurements. The Drop Shape Analyzer (Make: Kruss DSA25) is a robust and versatile instrument, ideal for a wide range of wetting investigations. This upgraded service empowers us to provide a deeper understanding of material surface properties. By utilizing multiple test fluids, we can accurately determine SFE, offering crucial insights for applications demanding detailed information on:

- Wettability: Characterizes how liquids interact with your material surfaces.
- Adhesion: Gain data to predict and optimize adhesion on solid surfaces.
- Surface Modifications: Effectively analyze the impact of surface treatments and coatings.
- Surface Cleanliness: Validate the cleanliness of surfaces with high precision.
- Material Characterization: Assess the surface properties of plastics, glass, ceramics, wood, or metals

RESEARCH PAPER PRESENTATION/CONTRIBUTORY TALKS

A.R. Vinod, Scientist-D & Group Head Additive Manufacturing, delivered an invited talk on “Directed Energy Deposition and its Applications” in a 1-week Professional Development Programme (PDP) on “Additive Manufacturing Technologies and its Applications”, organized by National Institute of Technical Teachers Training and Research (NITTTR, Ministry of Education, Government of India), Chennai for the faculty members in online mode on 22 April 2025.

PUBLICATIONS

D. Rajamani, A.R. Vinod, K. Niranjana Reddy, M. Siva Kumar, “Directed energy deposition (DED) of Inconel 718-SS316L bimetallic structures: Experimental investigations and optimization through artificial hummingbird algorithm for improved high strain rate and mechanical properties”, Results in Engineering (2025), Volume 25, 104014,

MOU/ NDA/COLLABORATION

CMTI & M/s. Vasmed Health Sciences Pvt. Ltd., executed the NDA on 17 April 2025, in connection with "Services of fabrication, and/or manufacturing of MEMS sensor as per the design provided, including, without limitations, fabrication setting, processing of wafers to manufacture/fabricate the MEMS dies at Contract Manufacturer facility".



EVENTS/WORKSHOPS ATTENDED

>>> CMTI PARTICIPATES IN WORLD IP DAY AT IISC BENGALURU

CMTI sponsored and participated in the World IP Day Celebration on "Driving Innovation with IP: Strategic Approaches to Commercialization," held on 30 April 2025 at the Faculty Hall, IISc Bengaluru, with Mr. Prakash Vinod, Joint Director, CMTI, addressing the inaugural session on behalf of CMTI. This year's theme, "IP and Music: Feel the Beat of IP," offered a unique and refreshing perspective on how intellectual property fuels creativity in unexpected ways. The event featured thought-provoking talks, engaging panel discussions, and valuable networking opportunities, highlighting the synergy between science, technology, and creative rights, and the pivotal role of IP in connecting them. The event was also attended by Mr. Krishna Rathod (Joint Director, C-PP&BD), Mrs. Sharmila M R (Senior Administrative Officer), Mr. Bhaskaragoud (Admin Assistant II) and Scientists: Mr. Manjunath M A, Mr. Ramesh B, Dr. Anusha Epparla, Dr. Abhinav Kumar, Dr. Ajay Jaswal, Mr. Bhavya Verma, Mr. Mayank Patel, Mr. Yogesh Patil, Mr. Anand Lavudya, and Mr. Ankur Bhardwaj.



TRAINING INITIATIVES

TRAINING PROGRAMME ON "LABORATORY MANAGEMENT & INTERNAL AUDIT AS PER ISO/IEC 17025:2017"

A training programme on "Laboratory Management & Internal Audit as per ISO/IEC 17025:2017" was conducted at CMTI from 22 to 25 April 2025 for participants from various organizations. Coordinated by Mrs. Khushboo, Scientist-D, the programme covered comprehensive topics essential for laboratory accreditation and internal auditing. It commenced with an introduction to



laboratory accreditation and the ISO/IEC 17025:2017 standard, followed by in-depth sessions on general and structural requirements, including impartiality, confidentiality, and resource management. Subsequent sessions focused on process requirements such as method validation, sampling, and measurement uncertainty, enriched with hands-on exercises. The final day highlighted internal audit practices, audit findings, corrective actions, and the pathway to NABL accreditation. The sessions were facilitated by faculty members Mr. K. Niranjan Reddy, Mr. Vijet Bhandiwad, Mr. Chetan H. S., Mr. Shashikumar, Mr. Krishna Mohan B, along with guest faculty Mr. Avadhani S. S., and concluded with an evaluation test and an interactive Q&A session.

TRAINING PROGRAMME ON "FABRICATION, CHARACTERIZATION AND PACKAGING OF A MICRODEVICE USING SEMICONDUCTOR PROCESSES"



A comprehensive training program on "Fabrication, Characterization and Packaging of a Microdevice using Semiconductor Processes" was conducted from 21 to 24 April 2025 for 20 participants from M/s. New Age Makers Institute of Technology, Gandhinagar. Exclusive Hands-on Training Programme on Fabrication, characterization and packaging of a microdevice using semiconductor processes for New Age Makers' Institute of Technology (NAMTECH), Gandhinagar, Gujarat.

The team of Sensor Technology Development Centre (STDC) of C-SVT, CMTI organized the Exclusive Hands-on Training Programme on Fabrication, Characterization and Packaging of a microdevice using Semiconductor processes from 21st - 24th April 2025 for 29 participants from NAMTECH. The programme coordinated by Mr. Harsha S, Scientist-D, started with Inaugural session which was graced by Dr. Sanjeev Gupta, Dean Academics at NAMTECH, Dr. Nagahanumaiah, Director of CMTI, and some Professors from NAMTECH. This program included Hands-on Training on MEMS Fabrication, MEMS Characterization and Micro System Packaging of a microdevice using Semiconductor processes for 4 days. Dr. Nagahanumaiah, Director of CMTI, concluded the training program with an interactive discussion with all the participants (Students and Faculty members from NAMTECH).

➤➤➤ EXCLUSIVE TRAINING PROGRAMME ON "SMART MANUFACTURING SYSTEMS & INDUSTRY 4.0/5.0" FOR HAL BENGALURU

A three-day training programme on "Smart Manufacturing Systems and Industry 4.0/5.0" was conducted from 15–17 April, 2024, for HAL Bengaluru and was coordinated by Mr. Narendra Reddy (Scientist-D, C-SMPM). The programme featured comprehensive lectures and demonstrations covering key topics such as an introduction to smart manufacturing and Industry 4.0, digitization of legacy machines, machine-to-machine connectivity, smart sensors and controls, reverse engineering, conventional manufacturing techniques, and smart metrology. Additional sessions included IIoT



demonstrations, machine vision and its applications, data acquisition for industrial IoT, edge devices, digital twins, augmented reality applications, and smart factory implementation. The training also covered AI/ML in manufacturing, the role of hydraulics and pneumatics in smart manufacturing, and live demonstrations of use cases including PLC automation, basic programming, and collaborative robotics. Participants also visited various CMTI labs to witness real-time implementations. The sessions were facilitated by CMTI faculty members: Mr. Prakash Vinod, Mr. Shanmugaraj V, Mr. S. N. Vithun, Mr. Bharat P, Mr. Vignesh K, Ms. Sushma D S, Mr. Vinod Venkatesh G, Mr. Harikrishna S. Thota, Mr. Girish Kumar, Mr. Deepak, Ms. Lavanya, Mr. K. Niranjana Reddy, Mr. Naveen K, Ms. Sarmistha Dhan, and Mr. Setti Suresh.

UPCOMING TRAINING PROGRAMS

1. "Measurement Uncertainty for Chemical & Mechanical Parameters by Guide for Uncertainty Measurement (GUM) Method", Course Code: 1301, from 02nd – 3 June 2025, at CMTI, Bengaluru.
2. "Thin Film Deposition Techniques & Characterization Methodologies", Course Code: 4203, from 09th – 11 June 2025, at CMTI Bengaluru.
3. "Calibration of CMM & Machine Tool", Course Code: 0325, from 09th – 10 June 2025, at CMTI Bengaluru.
4. "Corrosion and its Prevention through Surface Finishing", Course Code: 1304, from 10 – 11 June 2025, at CMTI Bengaluru.

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