The Science of Making...

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TECHNICAL ACHIEVEMENTS

HERMETIC SEALING ELECTRONIC COMPONENTS BY ELECTRON BEAM WELDING

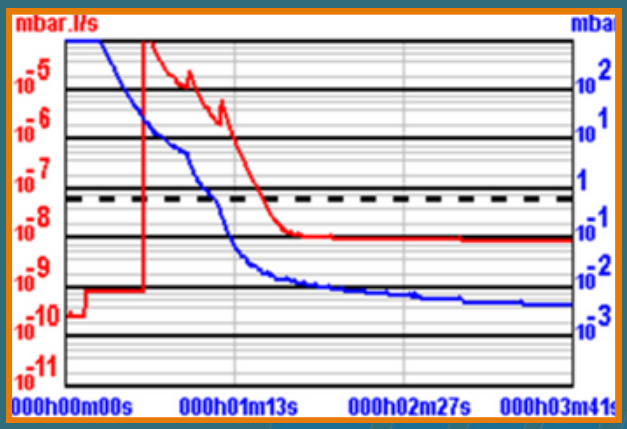
Hermetic packaging is essential for protecting electronic components from environmental contaminants and establishing an inert operating environment that safeguards the internal components, ensuring their long-term reliability. Electron beam welding (EBW) provides a clean and efficient method for creating airtight enclosures with several advantages related to hermetic sealing, including the ability to create high-quality seals, weld a wide range of materials, provide a clean welding environment, achieve high welding rates, and offer precise control over the process.

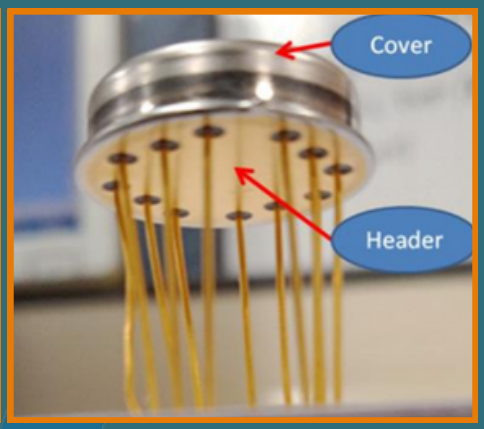
The Sensor Technology Development Center (STDC) at CMTI has established TO packaging using the EBW method. The results demonstrate that EBW can effectively achieve high levels of hermeticity, making that ensures reliability and performance of electronic devices. This method is well-suited for sealing TO packages due to its ability to weld dissimilar metals, such as SS-316L, TA-64, TA6246, Kovar, Niobium, Martensitic Steel, Inconel, Titanium, Copper, etc. These materials cover a wide range of applications in the electronics packaging industry, making EBW a versatile and practical solution. CMTI offers such services to Industries.

The accompanying figures illustrate an example of EBW welding between Kovar (Header) and steel (Cover), demonstrating its versatility in handling different material combinations. Multiple tests have been carried out to optimise the weld parameters, as presented in the included table.

	Trail1	Trail2	Trail3	Trail4
IL (mA)	1550	1619	1619	1619
IB (mA)	5	3	2	1.5
F (Deg/Min)	XY-Table	6000	6000	6000
IB tacking	1	1	1	1

The hermiticity of the sealing is checked by using a non-destructive helium leak test. For this, the component is soaked in helium gas for 24 hours at a pressure of 8 bar before the leak test. The rejection leak rate for the helium test was set to 10-7 mbar l/s. The leak rate was found to be very low at 7.7×10-9 mbar l/s, indicating a high level of hermiticity. The results demonstrate that EBW can effectively achieve high levels of hermiticity, with leak rates well below industry standards. This research highlights the potential of EBW as a reliable and versatile method for sealing electronics packages, ensuring long-term reliability and performance of electronic devices.





CMTI INVITES EXPRESSION OF INTEREST FOR TRANSFER OF NEW TECHNOLOGIES

As pioneers in introducing emerging machines and manufacturing process technologies, CMTI is proud to offer a rich portfolio of 65 technologies that are ready for transfer and integration to meet the requirements of today's dynamic market.

CMTI invites the expression of interest (EoI) from industries who are ready to embrace promising technologies through Technology Transfer (ToT) or to purchase customizable machines tailored to meet the unique production needs. The institute is also committed to fostering long-term strategic partnership that will promote innovation and enhance efficiency in existing operations of the interested industries. Here's a rundown of 11 new technologies ready for ToT.

1. ***AAKAAR 3D – The Digital Fringe Projection Scanning System***
2. ***Abrasive Flow Finishing Machine (AFFM-150D)***
3. ***Air Bearing Rotary Stage***
4. ***Machine tool condition monitoring EDGE module***
5. ***Pressure Endurance Test Rig***
6. ***Software Solution for Low-Cost Energy Monitoring***
7. ***SolViS – The Solar Module Inspection System***
8. ***Temperature Sensors***
9. ***Thermal Error Compensation Module (TECM) for Machine Tool Applications***
10. ***Ultra Precision Hydrostatic Slide (Nano Slideway HNS 200)***
11. ***Vacuum Chucks for Ultra-precision air bearing spindle***

ACCREDITATIONS

RENEWAL OF NABL ACCREDITATION FOR THE PRECISSION METROLOGY LABORATORY OF CMTI

The Metrology Laboratory at CMTI has been accredited under ISO/IEC 17025 for dimensional parameters since 1995. As part of the standard procedure, the accreditation cycle for the laboratory spans two years and was due for renewal.


National Accreditation Board for Testing and Calibration Laboratories

CERTIFICATE OF ACCREDITATION

METROLOGY LABORATORY, CMTI

has been assessed and accredited in accordance with the standard

ISO/IEC 17025:2017

"General Requirements for the Competence of Testing & Calibration Laboratories"

for its facilities at

TUMKUR ROAD, BENGALURU, KARNATAKA, INDIA

in the field of

CALIBRATION

Certificate Number: CC-2153

Issue Date: 08/09/2024 Valid Until: 07/09/2026

This certificate remains valid for the Scope of Accreditation as specified in the annexure subject to continued satisfactory compliance to the above standard & the relevant requirements of NABL.

(To see the scope of accreditation of this laboratory, you may also visit NABL website www.nabl-india.org)

Name of Legal Entity: CENTRAL MANUFACTURING TECHNOLOGY INSTITUTE

Signed for and on behalf of NABL

N. Venkateswaran
Chief Executive Officer

The laboratory underwent a comprehensive reassessment by NABL on July 13, 14, 17, and 18, 2024 and all the necessary criteria were fulfilled. Now, we are pleased to announce the renewal of our accreditation, which includes the approval to use the NABL Accredited CAB Combined ILAC MRA Mark on calibration certificates.

Currently, the laboratory is accredited for the calibration of 179 Basic Measuring Instruments/Gauges and 158 Precision Instruments in the dimensional category. The validity of the latest accreditation certificate extends until September 7, 2026.

BUSINESS INITIATIVES / MOU/ COLLABORATION

On September 9, 2024, CMTI and OLA Cell Technology Pvt. Ltd. signed a Non-Disclosure Agreement (NDA). Subsequently, on October 7, 2024, CMTI team members visited the OLA Gigafactory in Pochampalli, Tamil Nadu, and the OLA Battery Innovation Centre in Electronic City, Bengaluru. Both the organizations are exploring the collaboration opportunities in engineering of Battery Cell Manufacturing production lines.

On October 7, 2024, the CMTI team visited RAMSONS Garment Finishing Equipment Pvt. Ltd. in Bengaluru to explore potential technology development opportunities and discuss product solutions related to their machinery.

On October 8, 2024, CMTI and Elegance Vision Media Pvt. Ltd. executed a Memorandum of Understanding (MoU) to establish cooperation in content sharing, event coverage, webinars, and related joint initiatives.

EVENTS/CELEBRATIONS

AYUDHA POOJA CELEBRATIONS

CMTI celebrated Ayudha Puja on October 10, 2024 with vibrant enthusiasm and camaraderie, bringing together employees and their families to honor tradition and foster team spirit. The celebration commenced with an elaborate prayer ceremony, accompanied by devotional songs led by the employees of the institute, and the distribution of prasadam followed thereafter. The programme concluded with a motivational speech by the Director, CMTI followed by the felicitation of the wards of the employees for outstanding academic performance.

TRAINING PROGRAM/ SKILL DEVELOPMENT PROGRAMMES

Mr. Saravanan K, Scientist-C of the PDE Group, participated in three sessions of the NAFEMS e-learning course on the Fundamentals of Multibody Dynamics Simulation.

UPCOMING TRAINING PROGRAMMES

The following Training Programme scheduled for November - 2024 at CMTI, Bangalore.

- "Packaging & Characterization of MEMS & IC Devices", Course Code: 0740, from November 4-6, 2024, at CMTI, Bangalore.
- "Estimation of Measurement Uncertainty by MCS", Course Code: 0940, from November 11-12, 2024, at CMTI, Bangalore.
- "Advanced Materials Characterization Techniques", Course Code: 0390, from November 18-21, 2024, at CMTI, Bangalore.
- "Gear Engineering", Course Code: 0620, from November 19-20, 2024, at CMTI, Bangalore.
- "Introduction to CMM", Course Code: 0430, from November 20-22, 2024, at CMTI, Bangalore.
- "Laboratory Management & Internal Audit as per ISO / IEC 17025:2017", Course Code: 0410, from November 25-28, 2024, at CMTI, Bangalore.

Click here
for more details

Exciting updates are on the way—stay tuned for our next issue!...

Editorial Team
Dr. Debeshi Dutta - 8670958202
Dr. Anusha Epparla - 7382413886
Ms. M Janani Priya - 8310728569
write to us: directoroffice@cmti.res.in

Central Manufacturing Technology Institute
Tumkur Road, Bengaluru - 560022,
Karnataka, India Tel: +91-80-23372048
E-mail : director@cmti.res.in
Website : www.cmti.res.in