HBCL
HOMI BHABHA
CALIBRATION LABORATORIES

Calibration

Farmer Chamber

Well Chamber

Electrometer

Cables & Connectors

Repair & Services

HOMI BHABHA CALIBRATION LABORATORIES LLP

Secondary Standard Dosimetric Laboratory
Radiation Calibration & Instrumentation

Who We Are

Homi Bhabha Calibration Laboratories LLP (HBCL), located in Andhra Pradesh, is India's first NABL-accredited Dosimetric Calibration Laboratory dedicated to the Calibration of Radiotherapy Dosimeters in accordance with International Standards.

HBCL operates as a Secondary Standard Dosimetric Laboratory (SSDL) and Provides Traceable Absorbed Dose Calibration Services for Radiotherapy Centres, Research Institutions Across India and Abroad.

Accreditations, Recognition, and Metrological Framework

- NABL Accredited as per ISO/IEC 17025:2017
- AERB Licensed Calibration Laboratory for Radiation dosimeters
- Traceability to PTB, Germany (A Primary Standard Laboratory)
- International certificate acceptance through ILAC–MRA
- Calibration & Measurement Capability (CMC): 0.75%, among the lowest in India

Infrastructure & R&D Capabilities

HBCL possesses Advanced Metrological and Scientific Infrastructure:

- Reference-Class Ion Chambers, Electrometers, and Standard Dosimetry Systems
- Precision Co-60 Radiation geometry for absorbed-dose calibration
- Controlled laboratory environment with temperature & humidity monitoring
- Instrument development labs for Manufacturing and Testing
- Expertise from BARC-Trained Specialists & Radiation Scientists

Manufacturing & Product Development

HBCL undertakes the Design & Development of Radiation Measuring Instruments:

- Farmer-Type Cylindrical Ionization Chambers
- Brachytherapy Well-Type Ionization Chambers
- Basic & Advanced Electrometers
- TNC/BNC-Low noise tri axial Cables & Connectors
- Radiation Instrument Diagnostics & Repairs

Each product is engineered to align with international dosimetry standards and is validated using our in-house metrology systems.

Our Mission

To establish and sustain a world-class Dosimetric calibration infrastructure in India by delivering accurate, traceable, and internationally reliable radiation measurements, while advancing the development and manufacturing of high-precision Dosimetric instruments.

Calibration Services

Absorbed Dose to Water Calibration • Radiation Dosimetry Quality Assurance

Calibration Methodology & Protocols

Calibration is performed in terms of Absorbed Dose to Water $N_{(D,W),}$ using:

- PTB-Germany Traceable Reference Dosimeters
- Water Phantoms
- Standard beam qualities for Radiotherapy Dosimetry
- IAEA TRS-398,469 &381 (Absorbed Dose to Water Protocol)

We Calibrate the Following:

- Farmer-Type Cylindrical Ionization Chambers
- Plane-Parallel Ionization Chambers
- All Types of Small Field Ionization Chambers

Each Instrument undergoes:

- Pre-Calibration Inspection
- Leakage, Stability, Polarity, Recombination Checks
- Absorbed-Dose Calibration
- Environmental Corrections
- Statistical & Uncertainty Analysis
- Final Traceability Verification

Quality Assurance & Environmental Control

- All Received Instruments Are Stored in A Controlled Environment
- Continuous Monitoring of Temperature, Humidity & Ambient Conditions
- Periodic Reference Instrument Cross-Checks
- Uncertainty Budget Evaluation as Per ISO/IEC 17025:2017
- Redundancy-Based Metrological Verification
- Drift Assessment and Long-Term Stability Monitoring

Measurement Confidence & Uncertainty with a CMC of 0.75% Ensures:

- High Repeatability and Reproducibility
- Low Uncertainty in Calibration Coefficients
- International-Level Metrological Confidence
- Compliance with Global QA Requirements for Radiotherapy Centres

RATION LABORATORIES

Sri FC6G

Precision Redefined in Radiation Dosimetry

The Sri FC 6G Farmer Type Cylindrical Ion Chamber is developed and manufactured by HBCL LLP for Precise & Accurate Measurement for absolute therapy Dosimetry in Medical, Research, and Calibration Applications.

The Sri FC6G combines International grade performance standards with robust construction tailored for routine use.

Highlights:

- Farmer Type Cylindrical Ionization Chamber, Waterproof,
- vented and fully Guarded
- Active Volume: 0.6 cm^3 (Nominal)
- Cavity Material: Graphite (ρ = 1.85 g/cm^3)
- Collecting Electrode: Aluminium (ρ= 2.7 g/cm^3)
- High Precision and Linearity
- Stable Response and Long-term Reproducibility
- Compatible with Standard Electrometers

Applications:

- Reference and Field Class Dosimetry.
- Absorbed dose to Water, Air KERMA, & Exposure
- Calibration of Therapy-level Ionization Chambers.
- QA of linear accelerators and Radiotherapy equipments.

Sri Well Br

Your Partner in Precision Measurement

The Sri Well Br Well-Type Ion Chamber, Designed and Engineered by HBCL LLP, Delivers Precise and Reliable Activity Measurements, Ensuring Superior Accuracy for Brachytherapy and Radionuclide Source Strength Calibration.

Highlights:

- Well type Ionization Chamber, Vented & Guarded
- Suitable for HDR/LDR Ir-192, Cs, I, Sources
- Active Volume: 250 cm^3
- Measurement Range: 10 U – 80 MU (0.01 mCi – 20 Ci)
- Bias Voltage: ±300 V (Nominal)
- Leakage: ≤ ± 50 fA
- Stability: 0.2% over 2 years
- Nominal ResponseHDR Ir: 8.7 nA/Ci, CS: 5.7 nA/Ci, LDR Ir: 9.3 nA/Ci
- Connector: 2.0M Cable with BNC/TNC Triaxle
- Source holders Jigs are available for all types of sources and custom made

Applications:

- Source Strength Measurement of Brachytherapy Sources
- Measuring Quantities: Apparent Activity, Air KERMA Strength

Sri Dose nC

Engineered for Precision-Designed for Performance

The SRI Dose nC is a high-precision, secondary standard universal Electrometer designed to deliver unmatched reliability, stability, and accuracy in radiation dosimetry. Combining advanced electronics with a compact and lightweight design, it offers precision comparable to leading international dosimeters, at a highly economical cost.

Key Features:

- Suitable for Dosimetry in Radiation Therapy,
- Diagnostic Radiology and Health Physics.
- High accuracy with excellent resolution of 10 pC.
- Absolute Dose Measurement (integrated dose/charge).
- Exceeds requirements for leakage, linearity, reproducibility, and stability.
- Compatible with all type of Ion Chambers and Detectors.
- Built-in leakage Compensation ensures measurement integrity.
- Sri Dose nC provides dependable performance & Simple Operation

Technical Specifications:

1	Bias Voltage	:	Fixed 300 V / 150 V (to determine Ks)
2	Polarity	:	Positive and Negative (to determine Kp)
3	Timer	:	Continuous until manually stopped
4	Charge Mode Range	:	Medium range (0.01 nC to 200 nC)
5	Display	:	1) Integrated Charge (nC). 2) Timer (sec)
6	Operation	:	Start, Stop, and Reset
7	Warm-up Time	:	30 minutes
8	Leakage Current	:	$\leq 5 \times 10^{-15}$ A
9	Connector Type	:	TNC / BNC
10	Power Supply	:	230 V AC, 1 A

Sri Dose nC – Your Reliable Partner in Precision Dosimetry

Cables & Connectors:

HBCL Designs and Manufactures Precision-Engineered, Low-Noise Tri-Axial Cables Specifically Optimized for Radiotherapy Dosimetry Systems and High-Sensitivity Ionization Chamber Measurements. Built Using Radiation-Compatible Materials and Advanced Shielding Technology, These Cables Ensure Minimal Leakage Current, Which Is Critical For Accurate Dosimetry.

Cables:

- Standard Length: 10 m / 20 m high-performance Triaxial cable assemblies
- Custom Lengths: Custom-built cable lengths available as per user specification

Connectors:

- BNC-to-TNC or TNC-to-BNC cross connectors
- Dusting Caps for BNC & TNC Connectors

Key Features:

- Precision Assembly Using Premium Coaxial Cables
- Stable Electrical Performance & Minimal Signal Loss
- Each Cable Tested for Insulation Resistance & Continuity

Our Cables Ensure Low Noise, Excellent Shielding & Long-Term Durability Under Demanding Radiation Laboratory Conditions.

Comprehensive Repair Services

HBCL offers post-warranty repair and maintenance services to extend the life of your Dosimetry Equipment.

Ranges of Services:

- Electrometer Repair – All types of Digital and Analog electrometers
- Ion Chamber Repair – Farmer-Type, Plane-Parallel, and other Standard Chambers
- Signal Cable Repair – Connector Replacement, Insulation Repair, Leakage Control and Re-Testing

Each repair undergoes functional testing and calibration verification to ensure the performance meets original specifications.

Corporate Office:

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*Specifications are subject to change without any notification