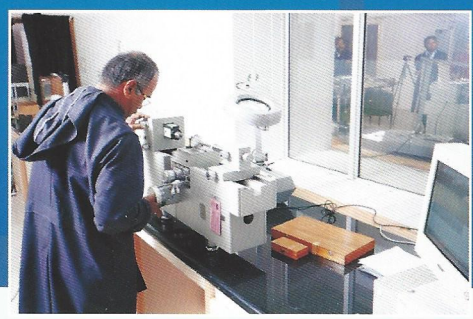
एफ.सी.आर.आई.

FCRI

FLUID CONTROL RESEARCH INSTITUTE

PHYSICAL STANDARDS LABORATORY



Fluid Control Research Institute (FCRI) has been accredited by National Accreditation Board for Testing and calibration Laboratories (NABL) as per ISO/IEC 17025, under the category of Mechanical Measurement' also. The mechanical measurement / metrology laboratory i.e., the PHYSICAL STANDARDS LABORATORY- of FCRI provides calibration services to Industries and Laboratories, in the field of Dimensional Metrology, Pressure, Mass, Volume, Density and Viscosity measurements. The laboratory is occupied with the most reliable and sophisticated reference instruments, operated under controlled environmental conditions. All master equipments are traceable to National Physical Laboratory at New Delhi. The laboratory is also equipped with reference instruments for Force and Torque. Calibration activities are carried out with established procedures in conformance with BIS/OIML/ISO/BS/ASTM standard specifications.

MASTER INSTRUMENTS AVAILABLE FOR CALIBRATION

Para meter	Equipment	Range	Accuracy
Length	Slip gauges	0.5 to 100mm	00 grade
	Gauge blocks	125 to 500mm	0 grade
	Slip gauge calibrator (PC interfaceable)	0 - 100mm	< 0.1 micron
	Universal length measuring machine	0 to 610 mm	0.46μm
	Surface Finish, Profile projector, Micro checker, Mu checker, Height master, Vernier Calipers etc.		
	Standard Weights	0.001g to 50 kg	Class E1,E2,F1
Mass	Micro Balance	0 to 50 g	1 g
	Micro Balance	0 to 210 g	0.01 mg
	Mass comparator	0 to 5 kg	0.001g
	Electronic Balance	64kg	0.001 g
	Electronic Balance	600 kg	0.1 g
Volume	Standard volume jar	5 litres/20 litres	0.02%
	Specific gravity bottle	50ml	0.02%
	Oil dead weight tester	1 to 1200 bar	0.025%
	Oil dead weight tester	1 to 600 bar	0.04%
	Air dead weight tester	-1000 to 1000mbar	0.02%
	Air dead weight tester	-1 to 7 bar	0.015%
	Absolute dead weight tester	30 mbar - 20 bar(abs)	0.025%
Pressure	Very low pressure Pneumatic dead weight tester	0.2 mbar -160 mbar	0.03%
	High Pressure Pneumatic dead weight tester	1 bar 160 bar	0.03%
	Multifunction pressure indicator	0 - 20 bar (abs)	0.025%
	Liquid column manometer, portable calibrator(400 bar), Precision pressure gauges(0.1% of span or better) etc are also available for calibration		
Force	Proving rings(tension & compression)	1C00kgf, 5C000kgf	Class A
Density	Hydrometer	0.6 to 1.6 g/ ml	L 50
Viscosity	Falling ball viscometer (for transparent Newtonian liquids and gases). capillary viscometer, standard liquids etc.	0.5 to 10^5 mPas/cSt	0.5%

Following Instruments can be tested / calibrated at PSL

Length/ Dimension metrology
- Slip gauges O,I,II / Inspection grade
- Gauge blocks
- Vernier caliper (Dial. Digital & ordinary)
- Depth vernier
- Dial gauges (plunger type, lever type)
- Dial thickness gauge
- Micrometer (all types)/ Depth micrometer
- Tapes, scales & tapes
- Feeler gauges
- Radius gauges, Knife gauge
- LVDT gauge
- Test sieves
- Thickness gauges
- Mu checkers
- G.S.M scale
- Pitch gauges, Pin gauges
- Plain plug & ring gauge
- Thread plug gauges
- Bore gauge, Wire gauge, Depth gauge
- Floating carriage micrometer
- Surface table/ Surface plate
- Straight edge
- Length bar
- Height gauge/ Master
- Micro checkers (inside/ outside/ depth)
- Combination set & Bevel Protractor
- Spirit level
- Special type of Length measuring instruments

Viscosity
- Viscometers (all types including rotational)
- Visco cups Ford, B1, B2 etc.
- Viscosity of liquids

Mass & Force
- Standard Weights & Analytical Weights
- Electronic / other balances
- Load cells (static/ Dynamic)
- Proving rings (tension & compression)
- Moisture balance
- Force gauges

Volume
- Pipettes (single mark & graduated)
- Burettes
- Measuring Jars
- Measuring flask
- Specific gravity bottle/ Pyknometer
- Proving can (volume / commercial measures)
- Micropipettes

Density
- Hydrometers (density)
- Brix Hydrometers
- Lactometers
- Baume Hydrometers
- Specific gravity hydrometers
- Digital/ Analog density meters
- Density of liquid
- Mass flow meters

Pressure
- Pressure gauges (air & oil)
- Pressure transducer/ transmitter
- Dead weight tester
- Vacuum gauges
- Manometer
- Leak tester

Other services of the Laboratory
- On site calibration / Testing of instruments
- Training of personnel in calibration
- Customised Testing/calibration services. for special requirements

Major Calibration & Testing Facilities at FCRI

Laboratory Fluid Flow NABL C026 / T027	Max. Flow Rate (m^3/h)	Max. Line Size	Uncertainty in Flow Rate (% reading)	Uncertainty in Volume (% reading)
Water Flow	4500 15000	900mm 2000mm	Upto 600 m^3/h : ±0.05% 600 to 2500 m^3/h : ±0.10% 2500 to 4500 m^3/h : ±0.15% 5000-15000 m^3/h : ±0.5%	20m^3 : ± 0.05%
Air Flow At Ambient conditions	10000	400mm	0-40m^3/hr : ± 0.1% >40m^3/hr : ± 0.25%	0-0.5 m^3: ± 0.1% 2 m^3 : ± 0.1%
Closed loop Air Test Facility (20 Bar) * Calibration Loop * Gravimetric Loop	 400 50	 100mm 50mm	 ± 0.3% ± 0.1%	
Oil Flow	650	250mm	0-100m^3/hr : ± 0.05% 100-650m^3/hr : ± 0.075%	Upto 1.8 m^3 : ± 0.03% 1.8m^3 to 9 m^3:± 0.04%
Compressed Natural Gas	4500 Kg/hr	1.5"	± 0.1%*	*under-Accreditation

	Parameters	Range	CMC Calibrations & Measurement Capability	Parameters	Range	Calibration & Measurement Capability
Mechanical Calibration Metrological, Pressure, Noise, Vibration etc. NABL C 056	**MASS**-Standards Weights	1mg and upto 500kg	0.00204 mg to 3 g	PRESSURE Pressure transducers	6-60 kg/cm^2 60-1200 kg/cm^2	±0.02% of rdg ±0.015% of rdg
	MASS-Weighing Balance & Mass Comparator	Various ranges from 0-2 g and upto 0-600 kg 0-20000 kg	0.001mg/g to 40 mg/kg 189 mg/kg	**PRESSURE**-Gauge pressure transducers (Pneumatic)	30 mbar to 2000 mbar abs 0.25 bar to 20 bar abs	±0.02% of rdg ±0.02%of rdg
	VOLUME –Specific Gravity bottle, Pipettes, Burettes measuring flasks	0.05 ml – 5000 ml	±0.01% of rdg	**PRESSURE** –Low Pressure Gauge & Differential	0.2 mbar to 3.2 mbar 3.2 mbar to 9.5 mbar 10mbar to 160 mbar	±0.2% of rdg ±0.16% of rdg ±0.023% of rdg
	DENSITY - Hydrometers	0.64g/cc – 1.98 g/cc	±0.0005g/cc	**PRESSURE** – Gauge Pressure Transducer (Pneumatic)	30 mbar to 2000 mbar g 1 bar g to 140 barg	±0.02% of rdg ±0.02% of rdg
	VISCOSITY- Liquids & Viscometers	1 to 60000 mPas/cSt	+/- 1% rdg	**PRESSURE**– Vacuum (Gauge)	-15 to -980 mbar g	±0.03% of rdg
				LENGTH-Slip Gauges(steel)	0.5 – 100 mm	0.05 µm to 0.16 µm
	Acoustic Pressure	94 dB @ 1 Khz 114 dB @ 1 Khz 124 dB @ 250 Hz	0.3 dB	Acceleration	10 to 100 m/s^2 (1 to 10g)	2.4% (5 Hz to 5 Khz)
	Sound Power	30 dB to 130 dB 31.5 Hz to 16 KHz	1.2 dB	Vibration Sensor	2 HZ to 15 Khz	2.5%
	Speed (Contact)	100 to 10000rpm	1.6 rpm	Vibration Sensor Sensitivity Check	100 - 160 Hz	1.30%
	Speed (Non Contact)	50 to 10000 rpm 10000 to 50000 rpm 50000 to 100000 rpm	1.0 rpm 2.0 rpm 3.5 rpm			
Electro Technical Calibration NABL C 0254	DC Voltage Source Measure	±100µV to ±1000V ±0.1mV to ±1000V	0.60% to 0.001% 0.12% to 0.0012%	DC Current Source Measure	±100µA to ±900A ±100µA to ±10A	0.014% to 2.0% 0.013% to 0.005%
	AC Voltage Source Measure	1mV to 1000V 100mV to 1000V	0.4% to 0.014% 0.04% to 0.03%	AC Current Source Measure	100µA to 700A 100µA to 10A	0.04% to 1% 0.06% to 0.035%
	Resistance Source Measure	10µΩ 10G Ω 100µΩ 1G Ω	0.6% to 0.02% 0.42% to 0.5%	Function Generator	1 Hz to 15 MHz	0.3% to 0.0025%
	Time	1 Sec - 5400 Sec	0.2µSec to 6.3µSec	Frequency	1 Hz to 600 MHz	1.0µHz to 1.2 Hz
Temperature Calibration NABL C 0255	Temperature	-70°C to +1200°C	±0.07°C to 1.3°C	Fixed Point cells	-38.8344°C to 961.78°C	6.3m°C to 24m°C
	*Temperature & Humidity Chamber	- 70°C to 180°C 10% to 95% RH		*IP Tests – Dust	IP 5X & IP 6X	
				*IP Tests – Water	IP X3 to IP X8	

* Not in NABL Scope

एफ.सी.आर.आई.

FLUID CONTROL RESEARCH INSTITUTE

(Under Ministry of Heavy Industries & Public Enterprises, Govt of India)
Kanjikode West, Palakkad 678623, Kerala, India
Telephone : Marketing : 91-491-2569010, Board : 91-491-2566206, 2566120, Director : 91-491-2566119
Fax : 91-491-2566326, Email : customercare@fcriindia.com Web Site : www.fcriindia.com