



CENTRE FOR WATER MANAGEMENT



Centre for water management (CWM), a state of the art test lab for flow products, mainly domestic and bulk water meters, offer different kinds of services like flow product assessment, in-situ measurement/calibrations, analysis, design and consultancy service related to flow problems especially in water distribution networks, surge etc.

In this facility, accurate measurement of flow in terms of volume is determined by gravimetric system. Flow range up to 300 m³/h in line size of 150 mm pipeline can be achieved in the laboratory with overall uncertainty in volume better than 0.03 %. Around 3000 water meters of various sizes are tested in CWM every year. The test facility is accredited by NABL and recognized by Bureau of Indian Standards. Testing of water meters of all sizes are conducted as per Indian and International standards.

Assistance is being offered to different water Utilities during bulk purchase of water meters. A Model approval program is launched to help the manufacturers to improve the quality of their meters.

Consultancy services offered

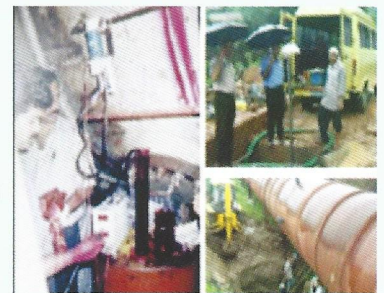
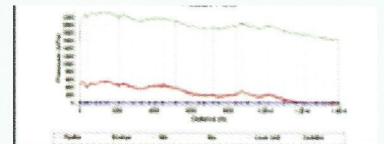
- ◆ Analysis, simulation and design of drinking water distribution systems
- ◆ Performance evaluation and augmentation of networks for firefighting systems
- ◆ Surge analysis of transmission systems for major cities
- ◆ Root cause analysis of pipe breaks and implementation of remedial measures
- ◆ Setting-up of test facility for water meters and other flow products
- ◆ Assessment of flow product test facilities for various flow product manufacturers and water boards
- ◆ Bulk procurement of water meters by various water boards

In-situ flow measurement & calibration done

- ◆ Flow measurement in large dia. pipes up to 3000 mm
- ◆ Field efficiency Test of hydro-electric turbines up to 250 MW
- ◆ Surge pressure measurement in transmission mains
- ◆ Flow measurement using non-conventional techniques like tracer dilution method, Gibson method etc.
- ◆ Performance evaluation of cooling water systems
- ◆ Measurement in open channels

Other Services

- ◆ Assessment of calibration and testing facilities for flow products
- ◆ Development of various Indian and International standards
- ◆ Training for professionals from water boards, consultants and manufacturers



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	
Mechanical Calibration Metrological, Pressure, Noise, Vibration etc. NABL C 056	Parameters	Range	CMC Calibrations & Measurement Capability	Parameters	Range	Calibration & Measurement Capability
	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
	Acoustic Pressure	94 dB @ 1 KHz 114 dB @ 1 KHz 124 dB @ 250 Hz	0.3 dB	LENGTH-Slip Gauges(steel)	0.5 – 100 mm	0.05 μm to 0.16 μm
	Sound Power	30 dB to 130 dB 31.5 Hz to 16 KHz	1.2 dB	Acceleration	10 to 100 m/s ² (1 to 10g)	2.4% (5 Hz to 5 KHz)
	Speed (Contact)	100 to 10000rpm	1.6 rpm	Vibration Sensor	2 HZ to 15 KHz	2.5%
	Speed (Non Contact)	50 to 10000 rpm 10000 to 50000 rpm 50000 to 100000 rpm	1.0 rpm 2.0 rpm 3.5 rpm	Vibration Sensor Sensitivity Check	100 - 160 Hz	1.30%
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 Water	IP 5X & IP 6X IP X3 to IP X8

* Not in NABL Scope



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