

Laboratory Elite Calibration Centre, 5A, 2nd Floor, Kamaraj Nagar, 2nd Street, Korattur, Chennai, Tamil Nadu

Accreditation Standard ISO/IEC 17025: 2005

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Validity 12.04.2018 to 11.04.2020 Last Amended on 26.04.2018

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (\pm)	Remarks
<u>ELECTRO-TECHNICAL CALIBRATION</u>				
1.	SOURCE			
1.	DC Voltage*	1 mV to 100 mV 100 mV to 10 V	1.42 % to 0.04 % 0.04 % to 0.13 %	Using Standard Multifunction Calibrator by Direct Method
2.	DC Current*	1 mA to 20 mA	1 % to 0.15 %	Using Standard Multifunction Calibrator by Direct Method
3.	DC Resistance*	1 Ω to 400 Ω 400 Ω to 40 k Ω	10.9 % to 0.61 % 0.61 % to 0.23 %	Using Standard Multifunction Calibrator by Direct Method
4.	Frequency*	1 Hz to 100 KHz	23.81 % to 5.8 %	Using Standard Multifunction Calibrator by Direct Method
5.	Temperature Simulation* (Temperature Indicator / Controller / Recorder)			
	J-Type	(-) 100 °C to 1200 °C	0.95 °C	Using Standard Multifunction Calibrator Direct by Simulation method as per Euramet cg – 11
	K-Type	(-) 100 °C to 1300 °C	1.09 °C	
	N-Type	(-) 100 °C to 1300 °C	0.93 °C	
	T-Type	(-) 100°C to 400 °C	0.74 °C	
	R-Type	0 °C to 1750 °C	1.53 °C	
	S-Type	0 °C to 1750 °C	1.53 °C	
	B-Type	600 °C to 1800 °C	1.43 °C	
	E-Type	(-) 100 °C to 990 °C	0.47 °C	
	RTD (PT-100)	(-) 100 °C to 800 °C	0.93 °C	

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II.	MEASURE			
1.	DC Voltage*	1 mV to 100 mV 100 mV to 10 V	1.29 % to 0.08 % 0.013 % to 0.13 %	Using Standard DMM & Multifunction Calibrator by Direct Method
2.	DC Current*	1 mA to 20 mA	1.65 % to 0.096 %	Using Standard DMM & Multifunction Calibrator by Direct Method
3.	DC Resistance*	1 Ω to 400 Ω 400 Ω to 40 k Ω	0.62 % to 0.014 % 0.014 % to 0.17 %	Using Standard DMM & Multifunction Calibrator by Direct Method
4.	Frequency*	1 Hz to 100 KHz	5.78 % to 0.58 %	Using Standard Multifunction Calibrator by Direct Method
5.	Temperature Measurement*			
	J-Type	(-) 200 $^{\circ}$ C to 1200 $^{\circ}$ C	0.64 $^{\circ}$ C	Using Standard Digital Multimeter & Multifunction Calibrator by Direct Method
	K-Type	(-) 200 $^{\circ}$ C to 1300 $^{\circ}$ C	0.64 $^{\circ}$ C	
	N-Type	(-) 200 $^{\circ}$ C to 1300 $^{\circ}$ C	0.64 $^{\circ}$ C	
	T-Type	(-) 200 $^{\circ}$ C to 400 $^{\circ}$ C	0.63 $^{\circ}$ C	
	R-Type	0 $^{\circ}$ C to 1750 $^{\circ}$ C	0.95 $^{\circ}$ C	
	S-Type	0 $^{\circ}$ C to 1750 $^{\circ}$ C	0.95 $^{\circ}$ C	
	B-Type	500 $^{\circ}$ C to 1800 $^{\circ}$ C	0.95 $^{\circ}$ C	
	E-Type	(-) 200 $^{\circ}$ C to 1000 $^{\circ}$ C	0.64 $^{\circ}$ C	
	RTD (PT-100)	(-) 200 $^{\circ}$ C to 800 $^{\circ}$ C	0.60 $^{\circ}$ C	
6.	Timer / Stopwatch Time Interval*	1 sec to 24 Hrs	0.15 sec to 208 sec	Using Digital Stopwatch by Comparison Method

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<u>MECHANICAL CALIBRATION</u>				
1.	DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)			
1.	Caliper ^s (Dial/Digital/Vernier) L.C.: 0.01 mm L.C.: 0.02 mm	0 to 600 mm 600 mm to 1000 mm	12 μ m 18 μ m	Using Slip Gauge / Length Bar/ Set Gr. 0/ Caliper checker as per IS: 3651 (Part 1 & 2)
2.	Height Gauge ^s (Dial/Digital/ Vernier) L.C.: 0.01 mm L.C.: 0.02 mm	0 to 600 mm 600 mm to 1000 mm	13 μ m 17 μ m	Using Length Bar/ Set Gr. 0/ Caliper checker as per IS: 2921
3.	External Micrometer ^s (Analog/ Digital) L.C.: 0.001 mm L.C.: 0.01 mm	0 to 150 mm 0 to 400 mm	2 μ m 8 μ m	Using Slip Gauge / Length Bar/ Set Gr. 0 as per IS: 2967
4.	Internal/Stick Micrometer ^s (Analog/ Digital) L.C.: 0.01 mm	0 to 300 mm	9.2 μ m	Using Slip Gauge / Length Bar/ Set Gr. 0 as per IS: 2966
5.	Depth Micrometer ^s (Analog/ Digital) L.C.: 0.001 mm	0 to 300 mm	7.4 μ m	Using Slip Gauge / Length Bar/ Set Gr. 0 as per BS: 6468
6.	Depth Gauge ^s (Vernier/Dial/ Digital) L.C.: 0.01 mm	0 to 300 mm	8.4 μ m	Using Slip Gauge / Length Bar/ Set Gr. 0 as per IS: 4213
7.	Dial/Digital Thickness Gauge ^s L.C.: 0.01 mm	0 to 25 mm	6.4 μ m	Using Slip Gauge Gr. 0 as per ECC/WI/DM-07

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8.	Ultrasonic Thickness Gauge [§] L.C.: 0.1 mm	0 to 100 mm	58 μ m	Using Steel Slip Gauge Gr. 0 as per ECC/WI/DM-08
9.	Groove Dial Gauge / Inside Caliper [§] L.C.: 0.01 mm	0 to 100 mm	6.9 μ m	Using Steel Slip Gauge Gr. 0 as per ECC/WI/DM-09
10.	Caliper Checker [§]	0 to 600 mm	5.2 μ m	Using Slip Gauge / Length Bar/ Set Gr. 0/ Dial Indicator as per ECC/WI/DM-10
11.	Plunger Type Dial Gauge [§] (Analog/Digital) L.C.: 0.001 mm L.C.: 0.01 mm	0 to 1 mm 0 to 25 mm	1.2 μ m 6.2 μ m	Using Dial Calibration Tester as per IS: 2092
12.	Digital/Dial Test Indicator [§] (Lever Type) L.C.: 0.001 mm	0 to 2 mm	2.3 μ m	Using Dial Calibration Tester as per IS: 11498
13.	Snap Gauge/Gap Gauge/Adjustable Snap Gauge [§]	2 mm to 300 mm	4.0 μ m	Using Slip gauge / length Bar aet Gr. 0 as per r IS: 7876
14.	Foils [§]	Up to 2 mm	1.6 μ m	Using Micrometer as per ECC/WI/DM-14
15.	Comparator Stand [§] (Flatness Only)	200 mm X 200 mm	2.2 μ m	Using Dial Indicator as per IS: 7599 Part 2

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16.	Plain Plug Gauge [§]	3 mm to 300 mm	4.7 μ m	Using Slip gauge / Length bar Set Gr. 0 as per IS: 3455, IS 6137, IS 6244 & IS 6246
17.	Feeler Gauge [§]	0.05 mm to 2 mm	2.1 μ m	Using Slip Gauge / Length Bar Set Gr. 0 / Micrometer and Dial Indicator as per IS: 3179
18.	Bore Dial Gauge (Transmission Error Only) [§] Span Dia 50 to 150 mm L.C.: 0.001 mm	1.2 mm	1.8 μ m	Using Digital Micrometer as per ECC/WI/DM-18
19.	Micrometer Setting Rod [§]	25 mm to 400 mm	7.1 μ m	Using Dial Calibration Tester as per ECC/WI/DM-19
20.	Coating Thickness Gauge [§]	Up to 2 mm	3.3 μ m	Using Slip gauge / Length bar Set Gr. 0 / dial indicator as per ECC/WI/DM-20
21.	LVDT/Electronic Probe [§] L.C.: 0.0001 mm L.C.: 0.01 mm	0 to 25 mm 25 mm to 200 mm	1.2 μ m 6 μ m	Using Standard Foil as per ECC/WI/DM-21
22.	Electronic Height Gauge / 2D (Digital) [*] L.C.: 0.0001 mm	0 to 600 mm	4.4 μ m	Using Slip gauge / Length bar Set Gr. 0 as per ECC/WI/DM-22

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23.	Surface Plate * (Granite/Cast Iron)	3000 mm x 2000 mm	$4.4 \sqrt{\frac{L+W}{200}} \mu\text{m}$	Using Length Bar and Slip Gauge Set as per IS: 7327, IS 2285 & IS 12937
II.	MASS			
1.	Weights \$ Accuracy Class F 1 & Coarser	1 mg 2 mg 5 mg 10 mg 20 mg 50 mg 100 mg 200 mg 500 mg 1 g 2 g 5 g 10 g 20 g 50 g 100 g 200 g 500 g 1 kg 2 kg 5 kg 10 kg 20 kg	0.02 mg 0.02 mg 0.02 mg 0.02 mg 0.02 mg 0.02 mg 0.02 mg 0.02 mg 0.02 mg 0.02 mg 0.02 mg 0.02 mg 0.02 mg 0.02 mg 0.02 mg 0.02 mg 0.02 mg 0.02 mg 0.09 g 0.09 g 0.09 g 0.09 g 0.16 g 0.16 g	Using Weights of Accuracy Class E2 and Balances of Readability = 0.01 mg as per OIML-R-111 Using Weights of Accuracy Class M1 and Balances of Readability = 0.1 g as per OIML-R-111
2.	Weighing Balance* (Readability:0.01 mg) (Readability: 0.1 mg)	0 to 60 g 60 to 200 g	0.12 mg 0.16 mg	Using Calibration of Electronic weighing balances of Class II & Coarser as per OMIL R-76-1

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	(Readability: 0.1 g)	0 to 3 kg 0 to 30 kg	0.12 g 0.19 g	Class III & Coarser
	(Readability: 50 g)	0 to 600 kg	0.07 kg	Class III & Coarser
III.	PRESSURE INDICATING DEVICES			
1.	Pressure (Pneumatic) (Pressure Gauges, Magnehelic Gauges, Manometers, Pressure Calibrators, Pressure Transmitters, Pressure Switches, Pressure Transducers) [#]	0 to 250 mmWc 0 to 1 bar 0 to 20 bar	0.51 % rdg 0.14 %rdg 0.08 % rdg	By Comparison method as per DKD-R-6-1
2.	Pressure (Hydraulic) (Pressure Gauges, Pressure Transmitters, Pressure Transducers) [#]	0 to 700 bar 0 to 1000 bar	0.06 %rdg 0.09 %rdg	By Comparison method as per DKD-R-6-1
3.	Vacuum (Vacuum Gauges, Vacuum Calibrators, Vacuum Transmitters) [#]	(-) 0.03 bar to (-)0.95 bar	0.13 %rdg	As per ISO 3567 & ISO 27893
IV.	VOLUME			
1.	Micropipette [§]	10 μ l to 100 μ l 100 μ l to 1000 μ l 1 ml to 10 ml	0.38 μ l 0.42 μ l 0.55 μ l	ISO 8655 Part 6

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2.	Pipette, Burette, Volumetric Flask & Measuring Cylinder ^s	1 ml to 100 ml	13 μ l	ISO 4787
V.	ACOUSTICS			
1.	Sound Level Meter ^s	30 dB to 130 dB	0.62 dB	OIML R-58
VI.	ACCELERATION AND SPEED			
1.	Speed (Non Contact Type) RPM Indicators, Stirrers, Centrifuges & Rotary Shakers [*]	50 RPM to 500 RPM 500 RPM to 15000 RPM	1 RPM 107 RPM	SANAS TR 45-01

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<u>THERMAL CALIBRATION</u>				
1.	TEMPERATURE			
1.	Glass Thermometer ^s	(-) 80 °C to 30 °C	0.6 °C	Using Standard RTD Sensor, Liquid Bath & 6 ½ Digit DMM
2.	RTD, Thermocouple with or without indicator of Baths, Oven, Furnaces, Temperature Gauges, Temperature Transmitters, Recorders, Incubators, Autoclaves, Refrigerators [#]	(-) 80 °C to 30 °C 30 °C to 100 °C 100 °C to 500 °C 500 °C to 1200 °C	0.15 °C 0.5 °C 0.68 °C 3.2 °C	Using Standard RTD Sensor / R Type TC, Liquid Bath / Dry Block Calibration & 6 ½ Digit DMM
3.	Thermal Chamber/ Furnace/ Oven [*]	(-) 80 °C to 400 °C 400 °C to 1200 °C	1.9 °C to 5.6 °C	RTD Sensor / Standard 'N' Type Thermocouple with DAQ (Multi-Position)

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II.	SPECIFIC HEAT & HUMIDITY			
1.	Humidity Indicator of Environmental Chamber*	30 % to 80 % @ 25 °C	1.98 %	Using Humidity Meter (Single Position)

* Measurement Capability is expressed as an uncertainty (\pm) at a confidence probability of 95%

§ Only in Permanent Laboratory

* Only for Site Calibration

The laboratory is also capable for site calibration however, the uncertainty at site depends on the prevailing actual environmental conditions and master equipment used.

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