

**Laboratory** R.P. Khedkar Calibration and Testing Centre, Plot No. 85, Azad Hind Nagar, Jaitala Road, Nagpur, Maharashtra

**Accreditation Standard** ISO/IEC 17025: 2005

**Certificate Number** CC-2475 (in lieu of C-0252, C-1281 & C-1282) **Page** 1 of 6

**Validity** 18.09.2017 to 17.09.2019 **Last Amended on** 06.12.2017

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability ( $\pm$ )	Remarks
<b><u>ELECTRO TECHNICAL CALIBRATION</u></b>				
<b>I.</b>	<b>SOURCE</b>			
	Temperature Simulation# (Temperature Indicator, Controller, Record)			
	K- Type	10°C to 1300°C	1.4°C	
	J- Type	(-) 50°C to 760°C	1.31°C	
	R- Type	0°C to 1700°C	1.87°C	
	S- Type	0°C to 1700°C	1.83°C	
	RTD (PT-100)	(-) 145°C to 800°C	1.31°C	

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Ram Ashray  
Convenor

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Avijit Das  
Program Director

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<b><u>MECHANICAL CALIBRATION</u></b>				
<b>I.</b>	<b>DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)</b>			
1	Caliper <sup>§</sup> (Vernier /Dial /Digital) L.C.: 0.01 mm <sup>Φ</sup>	0 to 200 mm 0 to 300 mm 0 to 600 mm	12 $\mu$ m 15 $\mu$ m 19 $\mu$ m	Using Caliper Checker Gauge Blocks As Per Comparison Method IS:3651(Part II) 1982
2.	Height Gauge <sup>§</sup> Vernier /Dial /Digital) L.C.: 0.01 mm <sup>Φ</sup>	0 to 600 mm	16 $\mu$ m	Using Caliper Checker, Gauge Blocks, Surface Plate as per IS 2921 Comparison Method
3.	External Micrometer <sup>§</sup> L.C.: 0.001 mm <sup>Φ</sup> L.C.: 0.01 mm <sup>Φ</sup>	0 to 100 mm 0 to 200 mm	2.3 $\mu$ m 6.8 $\mu$ m	Using Gauge Blocks as per IS 2967 by Comparison Method
4.	Micrometer Setting Rod <sup>§</sup>	Upto 175	4.7 $\mu$ m	Using Electronic Probe, Gauge Blocks Comparator Stand By Comparison Method
5.	Dial Gauge <sup>§</sup> (Plunger Type) L.C.: 0.001 mm <sup>Φ</sup> L.C.: 0.01 mm <sup>Φ</sup>	0 to 1 mm 0 to 25 mm	3.1 $\mu$ m 6.5 $\mu$ m	Using (Electronic) Dial Calibration Tester, Gauge Blocks, Electronic Probe as per IS 2092 Comparison Method
6.	Dial Gauge <sup>§</sup> (Lever Type) L.C.: 0.001 mm <sup>Φ</sup> L.C.: 0.01 mm <sup>Φ</sup>	0 to 0.14 mm 0 to 0.8 mm	3.1 $\mu$ m 4.3 $\mu$ m	Using Dial Calibration Tester as per IS 11498

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7.	Bore Gauge With Dial <sup>s</sup> (For Transmission Accuracy) L.C.: 0.001 mm <sup>ϕ</sup>	0 to 1 mm	4.1 $\mu$ m	Using Dial Calibration Tester, Comparison Method
8.	Dial Thickness Gauge <sup>s</sup> L.C.: 0.001 mm <sup>ϕ</sup>	0 to 10 mm	3 $\mu$ m	Using Gauge Blocks By Comparison Method
9.	Plain Plug Gauge/ Paddle Gauge <sup>s</sup>	0 to 100 mm 100 mm to 200 mm	2.8 $\mu$ m 3.5 $\mu$ m	Using Electronic Probe, Comparator Stand as per IS 3455
10.	Snap Gauge <sup>s</sup>	0 to 200 mm	3.4 $\mu$ m	Using Gauge Blocks as per IS 3455
11.	Feeler Gauge <sup>s</sup>	0 to 1 mm	2.7 $\mu$ m	Using Electronic Probe, Comparator Stand as per IS 3179
12.	Thread Plug Gauge <sup>s</sup>	0 to 100 mm	6.5 $\mu$ m	Using FCDM & Thread Measuring Wires by Comparison Method as per IS 14962
<b>II.</b>	<b>PRESSURE INDICATING DEVICES</b>			
1.	Pressure Hydraulic Digital /Dial Pressure Gauge <sup>s</sup>	7 kg/cm <sup>2</sup> to 50 kg/cm <sup>2</sup> >50 kg/cm <sup>2</sup> to 600 kg/cm <sup>2</sup>	0.89% rdg 0.31 % rdg	Using Dead Weight Pressure Gauge Tester as per DKD-R-6-1 & NABL 122-13
2.	Pressure Hydraulic Digital /Dial Pressure Gauge/Pressure Transmitter/Switch #	0 to 600kg/cm <sup>2</sup>	0.86% rdg.	Using Digital Pressure Gauge as per DKD-R-6-1 & NABL 122-13

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Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability ( $\pm$ )	Remarks
3.	Pressure Pneumatic Digital/Dial Pressure Gauge #	0 to 10 bar	0.96% rdg.	Using Pressure Calibrator as per DKD-R-6-2 & NABL 122-13
4.	Pressure Pneumatic Digital /Dial Vacuum Gauge #	0 to (-) 0.85 bar	0.008 bar	Using Pressure Calibrator as per DKD-R-6-2 & NABL 122-13
<b>III.</b>	<b>UNIVERSAL TESTING MACHINE</b>			
1.	Uniaxial Static Testing Machines Tension-Compression*	500 N to 2500 N 10 kN to 50 kN 20 kN to 1000 kN	0.56% 0.67% 0.68%	Using Proving Ring as per IS 1828-1:2015
<b>IV.</b>	<b>HARDNESS TESTING MACHINE</b>			
1.	Rockwell & Rockwell Superficial Hardness Tester By Indirect Method *	HRC	1.72 HRC	Using Standard Hardness Test Blocks As per IS1586-2:2012 (Indirect Method)
2.	Vickers Hardness Tester By Indirect Method*	HV10	1.85%	Using Standard Hardness Test Blocks As per IS1501(Part 2): 2013 (Indirect Method)
3.	Brinell Hardness Tester By Indirect Method*	HBW 10/3000	2.08%	Using Standard Hardness Test Blocks As per IS 1500 (Part 2) : 2013 (Indirect Method)

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V.	<b>IMPACT TESTING MACHINE</b>			
1.	Verification Of Impact Testing Machines (Metals) - Charpy *	0 to 750 J	0.96%	Using Clinometer, Master Load Cell, Height Gauge as per IS 3766, ISO 148 (2)
VI.	<b>TORQUE GENERATING DEVICES</b>			
		5 Nm to 50 Nm	2.04 % rdg	
		50 Nm to 200 Nm	1.81%rdg	
		200 Nm to 1000 Nm	0.66 % rdg	
2.	Type I/Class B <sup>s</sup>	5 Nm to 50 Nm	2.04 % rdg	Using Digital Torque Wrench Tester Based on IS/ISO 6789:2003

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<b><u>THERMAL CALIBRATION</u></b>				
<b>I.</b>	<b>TEMPERATURE</b>			
1.	Glass Thermometer <sup>§</sup>	40 °C to 110°C 110 °C to 250°C	1.05°C 1.1°C	Using SPRT With Indicator Micro Oil Bath Comparison Method IS:6274:1971 OIML R133:2002
2.	RTD Temperature Sensor With & Without Indicator <sup>§</sup>	(-) 15 °C to 110°C 110 °C to 250°C 250 °C to 550°C	1.01°C 1.17°C 1.7°C	Using SPRT With Indicator Micro Oil Bath/Negative Bath / Dry Block Comparison Method as per DKD-R 5-1:2010 ITS-90, IS:2848, IEC 60751
3.	Thermocouple Temperature Sensor With & Without Indicators <sup>§</sup>	300 °C to 1200°C	5.62°C	Using S Type Thermocouple with Indicator/ Dry Block by Comparison Method as per Euramet CG 08/v.2.1 :2011

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

<sup>§</sup>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.

<sup>φ</sup> Laboratory can also calibrate instruments/devices of coarser resolution / least count within the accredited range using same reference standard/ master equipment under the scope of accreditation.

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