

Laboratory

Size Masters Calibration Services, Final Plot No: 123, Lane No: 10,
Ramtekdi Industrial Estate, Hadapsar, Pune, Maharashtra

Accreditation Standard

ISO/IEC 17025: 2005

Certificate Number

CC-2460 (in lieu of C-0343, C-1049 &
C-1050)

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Validity

27.01.2018 to 26.01.2020

Last Amended on 07.02.2018

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (\pm)	Remarks
<u>ELECTRO-TECHNICAL CALIBRATION</u>				
I.	SOURCE			
1.	DC Voltage [#]	1 mV to 10 V 10 V to 1000 V	0.85 % to 0.15 % 0.15 %	Using 5 ½ Multifunction Calibrator by Direct Method
2.	DC Current [#]	1 mA to 100 mA 100 mA to 20 A 100 A to 800 A	0.72 % to 0.1 % 0.1 % to 1.05 % 1.30 %	Using 5 ½ Multifunction Calibrator Using Current Coil by Direct Method
3.	AC Voltage [#]	@ 50 Hz 5 mV to 100 mV 100 mV to 1 V 1 V to 900 V	1.7 % to 0.25 % 0.25 % to 0.75 % 0.75 % to 0.22 %	Using 5 ½ Multifunction Calibrator by Direct Method
4.	AC Current [#]	@ 50 Hz 1 mA to 100 mA 100 mA to 20 A 100 A to 800 A	0.75 % to 0.22 % 0.22 % to 1.05 % 1.35 %	Using 5 ½ Multifunction Calibrator Using Current Coil by Direct Method
5.	DC Resistance (2 Wire & 4wire) [#]	1 Ω to 1 k Ω 1 k Ω to 1 M Ω 1 M Ω to 100 M Ω 100 M Ω to 900 M Ω	1.7 % 2.6 % 2.6 % to 1.15 % 2.6 %	Using Decade Resistance (Zeal) ZDRB by Direct Method
6.	Capacitance [#]	@ 1 kHz 1 nF to 100 nF 100 nF to 1 μ F	2.9 % 2.9 %	Using Decade Capacitance Box (Zeal) ZDCB by Direct Method
7.	Frequency [#]	45 Hz to 1000 Hz	0.6% to 0.2%	Using 5 ½ Multifunction Calibrator by Direct Method

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8.	Inductance [#]	@ 1 kHz 100 μ H to 10 mH 10 mH to 100 mH 100 mH to 1 H	2.9 % 2.9 % 2.9 %	Using Decade Inductance Box (Zeal) ZDIB by Direct Method
9.	Temperature Simulation [#] (Indicator/Controller/Recorder)			
	J-Type K-Type R-Type S-Type T-Type N-Type RTD/PT-100	0 °C to 760 °C 0 °C to 1200 °C 0 °C to 1700 °C 0 °C to 1700 °C 0 °C to 400 °C 0 °C to 1200 °C (-) 150 °C to 800 °C	0.7 °C 1.0 °C 1.5 °C 1.5 °C 0.7 °C 0.7 °C 0.3 °C	Using Universal Calibrator Masibus Model – MC-12 by Direct Method
10.	AC Power/ Energy [#] 1 Phase 3 Phase	@ 50 Hz 50V to 300V 0.2A to 6A UPF to 0.5 PF (Lag, Lead)	1.4%	Using 3 Phase Power Energy Meter Calibrator by Direct Method
11.	Power Factor [#]	@ 50 Hz 240 V 1 A to 5 A UPF to 0.5 PF (Lag, Lead)	0.015 PF	Using 3 Phase Power Energy Meter Calibrator by Direct Method
II.	MEASURE			
1.	DC Voltage [#]	1 mV to 10 V 10 V to 1000 V	0.55 % to 0.01 % 0.15 %	Using 6 ½ DMM Fluke8846 A by Direct Method
2.	DC Current [#]	1 mA to 1 A 1 A to 10 A	0.65 % to 0.51 % 0.51 % to 0.2 %	Using 6 ½ DMM Fluke8846 A by Direct Method

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3.	AC Voltage [#]	@ 50 Hz 1 mV to 10 V 10 V to 900 V	0.65 % to 0.05 % 0.05 % to 0.20 %	Using 6 ½ DMM Fluke 8846 A by Direct Method
4.	AC Current [#]	@ 50 Hz 1 mA to 1 A 1 A to 10 A	0.17 % to 0.25 % 0.25 %	Using 6 ½ DMM Fluke 8846 A by Direct Method
5.	DC Resistance (2 Wire & 4 Wire) [#]	1 Ω to 1k Ω 1k Ω to 1M Ω 1M Ω to 100M Ω 100M Ω to 900M Ω	0.05 % to 0.13 % 0.013 % 0.013 % to 0.8 % 0.8 % to 2.35 %	Using 6 ½ DMM Fluke 8846 A by Direct Method
6.	Frequency [#]	50 Hz to 1 kHz	0.22 % to 0.35 %	Using 6 ½ DMM Fluke 8846 A by Direct Method
7.	Time [#]	10 s to 9000 s	6.2 s	Using Digital Timer by Comparison Method
8.	DC High Voltage [*]	1 kV to 10 kV	3.85 %	Using Fluke H.V. Probe 80K-40 with Rish 15S DMM by Direct Method
9.	AC High Voltage [*]	@ 50 Hz 1 kV to 5 kV	6.55 %	Using Fluke H.V. Probe 80K-40 with Rish 15S DMM by Direct Method

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<u>MECHANICAL CALIBRATION</u>				
I.	DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)			
1.	Micrometer ^s L.C.: 0.001 mm ^ϕ L.C.: 0.010 mm ^ϕ	0 to 400 mm 400 mm to 1000 mm	2.0 μ m 9.0 μ m	Using Micrometer Check Set, Circular Length Bars
2.	Master Rods/ Length Bars ^s	0 to 400 mm 400 mm to 1000 mm	4.0 μ m 8.0 μ m	Using Length Bars & Electronic Probe With D.R.O.
3.	Three Point Internal Micrometer/ Hole Test ^s	3 mm to 100 mm	3.0 μ m	Using Master Setting Ring Gauge
4.	Calipers ^s L.C.: 0.020 mm ^ϕ L.C.: 0.010 mm ^ϕ L.C.: 0.010 mm ^ϕ	0 to 1000 mm 0 to 600 mm 0 to 300 mm	28.0 μ m 15.0 μ m 12.0 μ m	Using Caliper Checker
5.	Plunger Dial ^s L.C.: 0.001 mm ^ϕ L.C.: 0.0005 mm ^ϕ	0 to 50 mm 0 to 25 mm	1.0 μ m 1.0 μ m	Using Horizontal Metroscope
6.	Lever Dial ^s L.C.: 0.010 mm ^ϕ L.C.: 0.001 mm ^ϕ	0 to 1 mm 0 to 0.140 mm	1.5 μ m 1.0 μ m	Using Horizontal Metroscope
7.	Bore Gauges/Two Pin Dial ^s (Only Transmission Accuracy)	3 mm to 400 mm	1.5 μ m	Using Horizontal Metroscope

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8.	Height Gauge [§] L.C.: 0.020 mm ^Φ L.C.: 0.010 mm ^Φ	0 to 1000 mm 0 to 600 mm	28.0 μ m 14.0 μ m	Using Caliper Checker
9.	Internal Micrometer/ Stick Micrometer [§] L.C.: 0.010 mm ^Φ	Up to 25.0 mm (Head) 2100 mm	3.71 μ m	Using 0 Grade Slip Gauge Set & Electronic Comparator
10.	Metric Scales [§]	Up to 1000 mm	75.0 μ m	Using Scale & Taper Calibrator
11.	Measuring Tape / Pie Tape [§]	0 to 50 mtr.	117 (\sqrt{L}) μ m Where L is in m	Using Scale & Taper Calibrator
12.	Dial Snap Gauge [§] L.C.: 0.001mm ^Φ	1 mm to 100 mm	2.0 μ m	Using 0 Grade Slip Gauges
13.	Dial Thickness Gauge [§] L.C.: 0.001mm ^Φ L.C.: 0.010mm ^Φ	0.1 mm to 10 mm	1.5 μ m	Using 0 Grade Slip Gauges
14.	Coating Thickness Gauge [§]	0 to 1000 μ m	2.0 μ m	Using Master Foils
15.	Pistol Caliper [§] L.C.: 0.1mm ^Φ	Up to 100 mm	35.0 μ m	Using Grade 0 Slip Gauges
16.	LVDT / Probe With D.R.O. [§] L.C.: 0.1 μ m ^Φ L.C.: 1.0 μ m ^Φ	0 to 25 mm 0 to 100 mm	0.6 μ m 0.84 μ m	Using K Grade Slip Gauge Set
17.	Glass Scale [§] L.C.: 0.010 mm ^Φ	0 to 300 mm	9.0 μ m	Using Tape & Scale Calibrator

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18.	Thread Plug Gauge ^{\$}	1 mm to 50 mm	2.0 μ m	Using FCDMM
		50 mm to 200 mm	2.0 μ m	Horizontal Metroscope
		200 mm to 450 mm	5.0 μ m	ULM-600mm& Counter Tracer (Major, Minor, Effe. Dia)
19.	Taper Thread Plug Gauge ^{\$}	4 mm to 100 mm	4.0 μ m	Using FCDMM
		100 mm to 200 mm	4.0 μ m	Horizontal Metroscope & Counter Tracer (Major, Minor, Effe. Dia)
20.	Thread Gauge ^{\$} Flank Angle Pitch Error	1° to 90° 0.4 mm to 10 mm	1' 3 μ m	Using Counter Tracer
21.	Thread Ring Gauge ^{\$}	3 mm to 200 mm	2.0 μ m	Using ULM
		200 mm to 450 mm	5.0 μ m	ULM-600mm& Counter Tracer (Major, Minor, Effe. Dia)
22.	Taper Thread Ring Gauge ^{\$}	4 mm to 200 mm	4.0 μ m	Using ULM With Taper Attachment & Counter Tracer(Major, Minor, Effe. Dia)
23.	Plain/Master Ring Gauge ^{\$}	3 mm to 200 mm	1.5 μ m	Using Horizontal Metroscope
		200 mm to 450 mm	5.0 μ m	ULM-600mm
24.	Plain Taper Ring Gauge ^{\$}	2 mm to 100 mm	3.0 μ m	Using Length Measuring Machine With Taper Attachment

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25.	Plain Plug Gauge/ Width Gauge/ OD Master/ Height Master ^s	Up to 100 mm 100 mm to 300 mm 300 mm to 450 mm	1.5 μ m 2.0 μ m 5.0 μ m	Using Probe With DRO , Slip Gauge Box Length Measuring Machine
26.	Plain Taper Plug Gauge ^s	2 mm to 100 mm	2.2 μ m	Using Length Measuring Machine With Taper Attachment
27.	Snap Gauge ^s	0.5 mm to 300 mm 300 mm to 450 mm	1.7 μ m 2.5 μ m	Using Slip Gauge ULM-600mm
28.	Feeler Gauge / Foil ^s	Up to 1 mm	1.5 μ m	Using Comparator With Comparator Stand
29.	V Block ^s Parallelism Squareness Symetricity	Up to 300 mm Up to 300 mm Up to 300 mm	4.5 μ m 7.5 μ m 7.5 μ m	Using Probe WITH DRO, Square Master
30.	Comparator Base ^s (Flatness)	Up to 400 mm	2.0 μ m	Using Probe With DRO/ Wyler
31.	Radius Gauge ^s	0.25 mm to 30 mm	17.5 μ m	Using Profile Projector
32.	Pitch Gauge ^s	0.25 mm to 6 mm	25.0 μ m	Using Profile Projector
33.	Slip Gauge ^s	Up to 20 mm 20 mm to 50 mm 50 mm to 100 mm	0.13 μ m 0.16 μ m 0.20 μ m	Using SLIP Gauge Calibrator & K Grade Slip Gauge
34.	Spline Plug Gauge ^s	0 to 100 mm 100 mm to 200 mm	2.5 μ m 2.5 μ m	Using FCDMM Horizontal Metroscope
35.	Spline Ring Gauge ^s	10 mm to 200 mm	2.5 μ m	Using Slip Gauge , Pin Gauge, ULM

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36.	Engineer's Square [§]	Up to 300 mm	7.0 μ m	Using Square Master & Slip Gauge
37.	Spirit Level [§] L.C.: 0.010 mm/m Digital Level [§] L.C.: 0.001 mm/m	Up to 300 mm Base Length	7.0 μ m/m 5.74 μ m/m	Using Probe With DRO, Grade 0 Slip Gauge
38.	Digital Angle Measuring Instruments/ Clinometer [§] L.C.: 0.01 [°] Φ Bevel Protector/ Combination Set [§] (L.C.: 5" [°] Φ)	0°-90°-0° (4 Quadrant)	36 sec 1.4'	Using Angle Gauge Set
39.	Surface Roughness Specimen [§]	Ra	7.5 %	Using Surface Roughness Tester
40.	Test Sieves/ Flakiness Sieves / Wire Gauge [§]	0.03 mm to 10 mm 10 mm to 125 mm	4.5 μ m 25 μ m	Using Profile Projector Digital Vernier Caliper
41.	Caliper Checker [§]	0 to 600 mm	5 μ m	Using Vertical Trimos, Length Bar, Slip Gauge
42.	Micrometer Head [§]	0 to 25 mm	0.85 μ m	Using Probe With DRO
43.	Ultrasonic Thickness Gauge [§]	0 to 200 mm	23.0 μ m	Using Step Gauge, Slip Gauge
44.	Thread Measuring Wire [§]	0.17 mm to 6.35 mm	0.5 μ m	Using ULM

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45.	Measuring Pin ^s	0.5 mm to 20 mm	0.84 μ m	Using Probe With DRO
46.	Cylindrical Setting Master ^s	Up to 100 mm	1.0 μ m	Using Probe With DRO, Lever Dial
47.	Sine Bar/ Sine Center ^s Linear Angular	Up to 300 mm	2 μ m 4"	Using Probe With DRO & Angle Gauge Set
48.	Surface Plate [#] (Granite/ Cast Iron)	2500 mm x 2500 mm	1.0 $\sqrt{L+W/100}$ (L & W are in mm)	Using Digital Spirit Level
49.	Calibration of Extensometer [*] (Clip-On Type, Video, Laser & COD Extensometer)	Up to 25 mm	2 μ m	Using Extensometer Calibration Fixture As Per IS 12872, ISO 9513 & ASTM E-83
50.	Calibration of Erichsen Cupping Testing Machine [*]	Up to 25 mm	7 μ m	Using Erichsen Cupping Punch Travel Calibration Fixture By Comparison Method As Per IS 10175-Part 1
51.	Calibration of Reticle & Magnification of Microscope [*]	Magnification Up to 1000 X	1.1 %	Using Glass Scale & Digital Caliper As Per ASTM E-1951
52.	Bench Centre [*]	Between Centre 500 mm	5 μ m	Using Mandrill & Lever Dial
53.	Air Gauge Unit [*]	\pm 0.08 mm	2 μ m	Using Master Setting Ring Gauge

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II. DIMENSION (PRECISION INSTRUMENTS)				
1.	Length Measuring Machine [#] (Horizontal) L.C.: 0.0001 mm ^ϕ	0 to 100 mm (Absolute Scale)	0.5 μ m	Using K Grade Slip Gauges
2.	Profile Projector/ Video Measuring Machine [#]	Linear X-Y, L.C.: 0.001 mm ^ϕ Angular Resolution 30" ^ϕ Magnification	5.0 μ m 2min of arc 1.1 %	Using Linear & Angular Glass Scales, Angle Gauge Set
3.	FCDMM [§]	0 to 200 mm	1.5 μ m	Using Cylindrical Setting Master , Probe With DRO, Optical Flat, Measuring Pin, Slip Gauge
4.	Dial Calibration Tester [§]	0 to 25 mm	0.84 μ m	Using Probe With DRO
5.	Height Gauge [#] L.C.: 0.0001 mm ^ϕ	0 to 1000 mm	4 μ m	Using Caliper Checker/ Length Bars
6.	Tape & Scale Calibrator [#]	0 to 1000 mm	6 μ m	Using Length Bars
III. ACCOUSTIC				
1.	Sound Level Meter [#]	@ 1 kHz 94 dB & 114 dB	0.7 dB	Using Sound Level Generator By Direct Method

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IV.	ACCELERATION & SPEED			
1.	RPM (Non- Contact) #	50 RPM to 100 RPM >(100 to 1000 RPM) >(1000 to 20000 RPM) >(20000 to 99999 RPM)	6.7 % 0.4 % 0.4 % 0.08 %	Using Non-Contact Type Digital RPM Meter By Comparison Method
V.	PRESSURE INDICATING DEVICES			
1.	Pressure Gauge, Pressure Transmitter, Transducer, Digital Pressure Gauge, Pressure Indicator, Pressure Switches #	0 to 35 bar 0 to 700 bar 0 to 2500 bar	0.020 bar 0.43 bar 1.56 bar	Using Digital Pressure Gauge & Comparison Test Pump by Comparison Method as per DKD R6-1
2.	Vacuum Gauges Digital & Analog, Vacuum Transmitter, Vacuum Indicator #	(-) 0.88 bar to 0 bar	0.006 bar	Using Digital Vacuum Gauge & Pneumatic Hand Pump by Comparison Method as per DKD R6-2
3.	Digital/Analog Pressure Gauge, Differential Pressure Gauge/Pressure Switch, Pressure Transmitter #	0 to 1000 mbar (0 to 10000 mmwc)	1.2 mbar	Using Digital Pressure Calibrator & Pneumatic Hand Pump by Comparison Method as per DKD R6-1
VI.	WEIGHTS			
1.	Weights \$ (F1 Class weights & coarser)	1 mg 2 mg 5 mg 10 mg 20 mg 50 mg	0.01 mg 0.01 mg 0.01 mg 0.01 mg 0.02 mg 0.02 mg	Using E2 class weights and Mass Comparators (Readability 0.01mg upto 100g and 0.1mg upto 200 g) as per OIML R-111:2004

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		100 mg 200 mg 500 mg 1 g 2 g 5 g 10 g 20 g 50 g 100 g 200 g	0.02 mg 0.02 mg 0.02 mg 0.03 mg 0.03 mg 0.03 mg 0.07 mg 0.07 mg 0.07 mg 0.16 mg 0.2 mg	
2.	Weights ^s (M1 Class weights and coarser)	500 g 1 kg 2 kg 5 kg 10 kg 20 kg	0.01 g 0.01 g 0.03 g 0.03 g 0.2 g 0.2 g	Using E2 & F1 Class Weights And Mass Comparators (Readability 0.01g upto 6kg and 0.2g upto 20 kg) as per OIML R-111:2004
3.	Electronic Weighing Balance # Readability: d \geq 0.01 mg (Class 1 weighing balances and coarser) Readability : d \geq 0.01 g d \geq 0.2g (Class 2 weighing balances and coarser) Readability : d \geq 1 g d \geq 10 g (Class 3 weighing balances and coarser)	10 mg to 200 g 500 mg to 6kg 10 g to 20 kg 20 g to 30 kg 200g to 300 kg	0.4 mg 0.02 g 0.2 g 2 g 10 g	Using E2 Class standard weights as per OIML R-76 Using E2 Class standard weights upto 5kg & F2 Class weights upto 300 kg as per OIML R-76

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VII.	VOLUME			
1.	Micropipettes ^s	10 μ l to 100 μ l 100 μ l to 1000 μ l 1 ml to 10 ml	0.20 μ l 1.09 μ l 5.06 μ l	Using Weighing Balance of d: 0.01/0.1mg & Distilled water as per ISO 8655-6
2.	Volumetric Measure ^s (Glass pipettes, Burettes, Conical flask, beakers, Measuring Jar)	1 ml to 100 ml 100 ml to 1000 ml 1000 ml to 5000 ml	0.07 ml 0.14 ml 0.7 ml	Using Weighing Balance of d: 0.01/0.1mg & Distilled water as per ISO 4787 Using weighing balance of d: 10mg & Distilled water as per ISO 4787
VIII.	UTM, TENSION CREEP AND TORSION TESTING MACHINE			
1.	Verification of Uniaxial Testing Machine (Load, Spring, Compression, Creep, Tension, Universal) *	10 N to 1000 kN (Tension)	0.19 %	Using Class 0.5 / 1 Force Proving Instruments / Load Cells As Per IS 1828 (Part-1), ISO 7500
2.	Verification Of Uniaxial Testing Machine (Load, Spring, Compression, Creep, Tension, Universal) *	10 N to 1000 kN (Tension)	0.34 %	Using Class A / AA Force Proving Instruments / Load Cells As Per ASTM E-4
3.	Verification Of Uniaxial Testing Machine (Load, Spring, Compression, Creep, Tension, Universal) *	10 N to 3000 kN (Compression)	0.18 %	Using Class 0.5 / 1 Force Proving Instruments / Load Cells As Per IS 1828 (Part-1), ISO 7500

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4.	Verification Of Uniaxial Testing Machine (Load, Spring, Compression, Creep, Tension, Universal) *	10 N to 1000 kN (Compression)	0.38 %	Using Class A / AA Force Proving Instruments / Load Cells As Per ASTM E-4
5.	Verification of Cross Head of Uniaxial Testing Machine Force Displacement *	Up to 300 mm	0.33 %	Using Linear Scale With Dro As Per ASTM E-2309
6.	Verification Of Speed Of Cross Head Of Uniaxial Testing Machine *	0 to 300 mm/min	1 mm/min	Using Displacement Calibrator & Stop Watch As Per ASTM E-2658
IX.	IMPACT TESTING MACHINE			
1.	Calibration of Charpy & Izod Impact Testing Machine *	Up to 750 J	0.65 %	Using Impact Testing Kit As Per IS 3766, ISO 148-2, ASTM E-23, BS: 131PART-4, & BSEN 10045
2.	Calibration Of Charpy & Izod Plastic Impact Testing Machine *	Up to 50 J	0.50 %	Using Impact Testing Kit As Per ISO 13802 & ASTM D256

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X.	HARDNESS TESTING MACHINES			
1.	Verification Of Test Force For Rockwell & Rockwell Superficial, Brinell & Vickers Hardness Tester *	9.807 N to 29421 N	0.21 %	Using Class 0.5 / 1 Force Proving Instruments / Load Cells As Per IS 1586, ISO 6508-2, IS 1500, ISO 6506-2 & IS 1501, ISO 6507-2
2.	Verification Of Test Force For Rockwell & Rockwell Superficial, Brinell & Vickers Hardness Tester *	9.807 N to 29421 N	0.21 %	Using Class A / AA Force Proving Instruments / Load Cells As Per ASTM E-18, ASTM E-10, ASTM E-92, ASTM E-384
3.	Verification Of Rockwell Hardness Testing Machine *	HRA HRBW HRC HR 15N HR 30N HR 45N HR 15TW HR 30TW HR 45TW	0.50 HRA 0.50 HRBW 0.50HRC 0.50 HR 15N 0.50 HR 30N 0.50 HR 45N 0.50 HR 15TW 0.50 HR 30TW 0.50 HR 45TW	Using Standard Hardness Testing Blocks As Per IS 1586-2, ISO 6508-2 & ASTM E-18
4.	Verification Of Brinell Hardness Testing Machine *	2.5/31.25 HBW 2.5/62.5 HBW 2.5/187.5 HBW 5/250 HBW 5/750 HBW 10/500 HBW 10/1000 HBW 10/3000 HBW	5.79 % 3.85 % 2.34 % 2.63 % 2.0 % 1.59 % 2.5 % 2.0 %	Using Standard Hardness Testing Blocks As Per IS 1500-2, ISO 6506-2 & ASTM E-10

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Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (\pm)	Remarks
5.	Verification Of Micro-Vickers Hardness Testing Machine *	HV 0.1 HV 0.2 HV 0.3 HV 0.5 HV 1	3.50 % 3.20 % 2.52 % 2.42 % 1.81 %	Using Standard Hardness Testing Blocks As Per IS 1501-2, ISO 6507-2 & ASTM E-384
6.	Verification Of Vickers Hardness Testing Machine *	HV 5 HV 10 HV 20 HV 30 HV 50	1.5 % 1.5 % 1.5 % 1.5 % 1.5 %	Using Standard Hardness Testing Blocks As Per IS 1501-2, ISO 6507-2 & ASTM E-92
7.	Verification Of Leeb (Dynamic) Hardness Testing Machine By Indirect Method *	'D' Scale	7 HLD	Using Standard Hardness Testing Blocks As Per ASTM A-956
8.	Verification Of Depth Measuring System Of Rockwell Hardness Tester *	0 to 0.2 mm	6 μ m	Using Depth Measuring Calibrator As Per IS 1586-2, ISO 6508-2 & ASTM E-18
9.	Verification Of Indentation Measuring System Of Brinell & Vickers Hardness Testing Machine *	Up to 7 mm	0.7 %	Using Glass Scale As Per IS 1500, IS 1501 ASTM E-10 ASTM E-92 & ASTM E-384
10.	Verification Of Testing Cycle Of All Types Of Hardness Testing Machine *	Up to 180 sec	8 sec	Using Stop Watch As Per IS 1586, ISO 6508-2 & ASTM E18, IS 1500, ISO 6506-2 & ASTM E10 IS 1501, ISO 6507-2, ASTM E92 & ASTM E384

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Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (\pm)	Remarks
XI.	TORQUE MEASURING DEVICES			
1.	Torque Wrenches [§]	1 Nm to 3000 Nm	1.5 %	Using Torque Wrench Calibrator Sensors As Per ISO 6789
2.	Torque Measuring Devices [§]	0.2 Nm to 1 Nm 1 Nm to 100 Nm 100 Nm to 2000 Nm	0.36 % 0.1 % 0.1 %	Using Dead Weight Torque Calibration System As Per BS 7882:2008
XII.	MOBILE FORCE MEASURING SYSTEM			
1.	Push Pull Gauge [§] (Pull Direction Only)	50 N to 500 N	3.05 N (0.6 %)	Using Newtonian Dead Weights & Hangers As Per VDI: 2624 Part 2, 1
XIII.	DUROMETER			
1.	Shore Hardness Tester [§]	0 to 100 Shore	1.5 %	Using Shore Hardness Tester Calibrator As Per ASTM D-2240
2.	Shore Hardness Tester Calibrator [§]	0 to 100 Shore	0.45 Shore	Using Class 1 Load Cells As Per ASTM D-2240

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Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (\pm)	Remarks
<u>THERMAL CALIBRATION</u>				
I.	TEMPERATURE			
1.	RTD & Thermocouple Sensor-With And Without Indicators, Temperature Controller & Indicators [#]	(-) 80 °C to 250 °C 250 °C to 600 °C 600 °C to 1200 °C	0.5 °C 1.5 °C 2.4 °C	Using RTD Sensor/ S-Type, R-Type Thermocouple with Indicator And Liquid Bath, Dry Well Bath By Comparison Method
2.	Glass Thermometer, Dial Thermometers [#]	25 °C to 250°C	0.75°C	Using RTD Sensor and Liquid bath by Comparison Method
3.	Temperature Mapping For – Ovens, Chambers, Freezers, Cold Rooms, Furnaces, Autoclaves [*]	(-) 25 °C to 250 °C 250 °C to 1200 °C	3.3°C 6.1°C	Using Multiple RTD/K Type TC Sensors with Data Logger By Temperature Mapping As Per IEC 600680-3-5, IEC 600680-3-6, ASTM 2750D API 6A & 16A
II.	SPECIFIC HEAT AND HUMIDITY			
1.	Digital Thermohygrometers, Digital Humidity Indicators, Humidity Sensors [#]	20% to 95% RH @ 25°C 10°C to 50°C @ 50% RH	2.3% RH 0.35 °C	Using Humidity Indicator with Humidity Chamber by Comparison Method

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Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (\pm)	Remarks
2.	Environmental Chambers, Ovens, Cold Rooms*	15% to 90% RH	4.8% RH	Mapping Method-Using Multiple Sensors With Data Logger

* 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.

ϕ 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.