

Laboratory Castro Engineering Pvt. Ltd., "W" Road, Shanpur (Shibtala), Dasnagar, Howrah, West Bengal

Accreditation Standard ISO/IEC 17025: 2005

Certificate Number CC-2539 (In lieu of C-0451)

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Validity 18.01.2018 to 17.01.2020

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Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (\pm)	Remarks
<u>MECHANICAL CALIBRATION</u>				
I.	DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)			
1.	Scale & Tape Calibration Unit [§]	0 to 1000 mm	18.7 μ m	Using Length Bar & Slip Gauge Set (Grade K)
2.	Depth Micrometer [§]	0 to 100 mm	8.5 μ m	Using Slip Gauge Set (Grade K)
3.	Plunger Type Dial Gauge [§] L.C:0.01 mm L.C:0.001 mm	0 to 25 mm 0 to 1 mm	11.4 μ m 3.26 μ m	Using Digital Micrometer Head & Comparator stand & Slip Gauge Set
4.	Lever Type Dial Gauge [§] L.C:0.01mm	0 to 0.8 mm	8.2 μ m	Using Slip Gauge Set (Grade K) & Comparator Stand
5.	Bore Dial Gauge [§] (For Transmission only)	0 to 2mm	7.85 μ m	Using Digital Micrometer Head, Comparator Stand, Slip Gauge Set (Grade K) & Slip Gauge Accessories
6.	Snap Gauge [§]	0 to 100 mm	12 μ m	Using Slip Gauge Set & Slip Gauge Accessories
7.	Test Sieves [§]	2 mm to 125 mm	17 μ m	Using Digimatic Caliper
8.	Plain Plug Gauge [§]	0.17 to 100 mm	7.35 μ m	Using Electronic Probe with DRO, Comparator Stand & Slip Gauge Set (Grade K)

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Convenor

Avijit Das
Program Director

Laboratory

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9.	Micrometer Setting Rod ^s	0 to 900mm	10 μ m	Using Electronic Probe with DRO, Comparator Stand & Slip Gauge Set (Grade K)
10.	Measuring Pin ^s	0.17 to 20 mm	7.45 μ m	Using Electronic Probe with DRO & Comparator Stand
11.	Feeler Gauge ^s	0 to 1 mm	9 μ m	Using Digital External Micrometer
12.	Steel Scale ^s	0 to 1000 mm	245 μ m	Using Scale & Tape Calibration Unit
13.	Steel Tape ^s	0 to 50000 mm	300 μ m	Using Scale & Tape Calibration Unit
14.	Digital Coating Thickness Gauge ^s	0 to 719 μ m	15 μ m	Standard Foil
15.	Foils ^s	Upto 1600 μ m	10 μ m	Using Digital External Micrometer
16.	PI Tape ^s	0 to 2000 mm	280 μ m	Using Scale & Tape Calibration Unit
17.	Bevel Protractor/ Angle Protractor ^s	0 to 360°	5'	Using Steel Angle Gauge
18.	Thickness Gauge ^s	0 to 25 mm	2.6 μ m	Using Slip Gauge Set (Grade K)
19.	Pistol Caliper ^s	0 to 100 mm	11.66 μ m	Using Slip Gauge Set (Grade K)

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20.	External Micrometer ^s L.C: 0.001 mm	0 to 25 mm	1.6 μ m	Using Slip Gauge Set (Grade 0)
	L.C: 0.01 mm	0 to 1000 mm	28 μ m	Using Slip Gauge Set (Grade 0) & Length Bar
21.	Internal Micrometer ^s L.C: 0.01 mm	0 to 1000 mm	20 μ m	Using Slip Gauge Set (Grade 0) & Length Bar
22.	Caliper ^s (Vernier/ Dial) L.C: 0.02 mm	0 to 1000 mm	12.6 μ m	Using Steel Caliper Checker, Slip Gauge Set (Grade K)
23	Caliper ^s (Digital) L.C: 0.01 mm	0 to 1000 mm	12.6 μ m	Using Steel Caliper Checker, Slip Gauge Set (Grade K)
24.	Height Gauge ^s L.C: 0.01 mm	0 to 1000 mm	15 μ m	Using Steel Caliper Checker, Slip Gauge Set (Grade K)
25.	Vernier Depth Gauge ^s L.C:0.02 mm	0 to 200 mm	10 μ m	Using Steel Caliper Checker, Slip Gauge Set (Grade K)
26.	Micrometer Head ^s L.C:0.001 mm	0 to 50 mm	10 μ m	Using Slip Gauge Set (Grade K) & Comparator Stand

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27.	Electronic Probe with DRO ^s	0 to 2 mm	2 μ m	Using Slip Gauge Set (Grade K) & Comparator Stand
28.	Straight Edge ^s	0 to 1000 mm	46.6 μ m	Using Slip Gauge Set (Grade K)
29.	Porter Gauge ^s	100 mm	19 μ m	Using Electronic Probe with DRO, Surface Plate, Feeler Gauge, Digital Caliper by comparison method
II.	UTM, TENSION CREEP AND TORSION TESTING MACHINE			
1.	Uniaxial Testing Machine* Tension	200 N to 50 Kn	0.56%	Using Force Proving Ring as per IS 1828(P-1)
	Compression	2 kN to 1000 kN 400 kN to 2000 kN	0.96%	Using Force Proving Ring as per IS 1828(P-1)
III.	HARDNESS TESTING MACHINES			
1.	Rockwell Hardness Tester*	HRC HRB HRA	0.63 HRC 1.75 HRB 1.05 HRA	Using Standard Rockwell Hardness Blocks as per IS 1501 (P-2)

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2.	Brinell Hardness Tester*	544.1 HBW 5/750 184.9 HBW 5/750 187.8 HBW 10/3000 606.8 HBW 10/3000	2.4% 3.1%	Using Standard Brinell Hardness Blocks
3.	Vickers Hardness Tester*	HV 5 HV 30	4% 4.53%	Using Standard Vickers Hardness Blocks as per IS 1500 (P-2)
IV.	WEIGHTS			
1.	Mass ^s	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	0.061 mg 0.061 mg 0.061 mg 0.061 mg 0.063 mg 0.063 mg 0.063 mg 0.063 mg 0.063 mg 0.07 mg 0.07 mg 0.10 mg 0.10 mg 0.12 mg 0.21 mg 0.39 mg 0.77 mg	Using E2 Class standard weights ABBA method with Digital Weighing Balance upto 80 g of d=0.01mg & upto 200 g of d=0.1 mg, as per OIML R111:2004

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		500 g	0.01 g	Using E2 & F1 Class standard weights ABBA method with Digital weighing Balance upto 4 Kg of $d=10\text{mg}$ & upto 30 Kg of $d=1\text{ g}$, as per OIML R111
		1 kg	0.02 g	
		2 kg	0.03 g	
		5 kg	0.92 g	
		10 kg	1.41 g	
		20 kg	1.41 g	
V.	WEIGHING SCALE AND BALANCE			
1.	Balance* $d \geq 0.01\text{ mg}$ $d \geq 0.1\text{ mg}$ $d \geq 1\text{ mg}$ $d \geq 1\text{ g}$ $d \geq 5\text{ g}$ $d \geq 10\text{ g}$	1 mg to 80 g >80 g to 200 g >200 g to 4000 g >4 kg to 30 kg >30 kg to 50 kg >50 kg to 100 kg	0.3 mg 12 mg 0.046 g 1.83 g 8.0 g 17.0 g	Using E2 Class standard weights 1 mg to 200 g, as per OIML R76 & NABL 122-03 E2 & F1 Class standard weights >200g to 20 kg, as per OIML R76 & NABL 122-03 F1 class standard weights >200g to 20 kg, as per OIML R76
VI.	VOLUME			
1.	Micropipette [§]	>50 μl to 100 μl >100 μl to 2000 μl	1.5 μl 2.0 μl	Using Digital Balance upto 80 g/200g readability 0.01/0.1 mg and distilled water of known density, as per IS 8655-6 & ISO/TR 20461

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2.	Glass Pipettes [§] (Graduated/ Non Graduated)	0.1 ml to 25 ml	15 μ l	Using Digital precision balance and distilled water of known density, as per ISO 4787 & ISO/TR 20461
3.	Glass Burette [§]	1 ml to 50 ml	58 μ l	
4.	Measuring Cylinder/ Volumetric Flask/ Conical Flask/ Beaker [§]	1 ml to 50 ml >50 ml to 100 ml >100 ml to 1000 ml	58 μ l 58 μ l 420 μ l	
V.	PRESSURE INDICATING DEVICES			
1.	Hydraulic Pressure # (Dial/ Digital Pressure Gauges/ Calibrators/ Indicators, Pressure Transmitters, Pressure Switches/ Valves)	1to 700 Bar >700 to 1000 Bar	1.55% rdg 1.50 % rdg	Using Digital Pressure Gauge & Hydraulic Pump, Comparison method as per DKD-R-6-1
2.	Pneumatic Pressure # (Dial/ Digital Pressure Gauges/ Calibrators/ Indicators, Pressure Transmitters, Pressure Switches/ Valves)	0 to 35 Bar	6.67% rdg.	Using Digital Pressure Gauge & Pneumatic Pump, Comparison method as per DKD-R-6-1
3.	Pneumatic Low Pressure# (Dial/ Digital Pressure Gauges/ Calibrators/ Indicators, Magnehelic Gauges, Pressure Transmitters, Pressure Switches/ Valves)	0to 200 mm H2O	3.5% rdg.	Using Digital Pressure Gauge & Pneumatic Pump, Comparison method as per DKD-R-6-1

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4.	Vacuum [#] (Dial/ Digital Vacuum Gauges/ Calibrators/ Indicators)	(-)0.85 to 0 bar	2.48% rdg.	Using Digital Vacuum Gauge & Vacuum Comparator, Comparison method as per DKD-R-6-2

* 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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