

Laboratory Eastern Calibrators, 1 Anil Roy Road, Kolkata, West Bengal

Accreditation Standard ISO/IEC 17025:2005

Discipline Mechanical Calibration

Issue Date 24.04.2015

Certificate Number C- 0370

Valid Until 23.04.2017

Last Amended on -

Page 1 of 9

Quantity Measured/ Instrument	Range / Frequency	*Calibration Measurement Capability (\pm)	Remarks
I. DIMENSION			
1. EXTERNAL MICROMETER (INCLUDING DIGIT, DIGIMATIC)			
LC.: 0.001 mm	0 to 25 mm	3.6 μm	Using Slip Gauge Sets Electronic Height Gauge & Granite Surface Plate by Comparison Method
	25mm to 150 mm	4.6 μm	
LC.: 0.01 mm	25 mm to 150 mm	7.0 μm	
	150 mm to 300 mm	8.0 μm	
	300 mm to 400 mm	9.0 μm	
	400 mm to 500 mm	10.5 μm	
	500 mm to 600 mm	11.4 μm	
2. INTERNAL MICROMETER			
LC.: 0.01 mm	50 mm to 500 mm	11.4 μm	Using Electronic Height Gauge by Comparison Method
3. CALIPER (VERNIER, DIAL, DIGIMATIC)			
LC.: 0.01 mm Φ	Upto 300 mm	8.93 μm	Using Slip Gauge Sets External Micrometer & Electronic Height Gauge by Comparison Method
	300 mm to 600 mm	12.80 μm	
LC.: 0.05 mm	Upto 600 mm	31.00 μm	

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Last Amended on - Page 2 of 9

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4. HEIGHT GAUGE VERNIER, DIAL, DIGIMATIC) LC.: 0.01 mm Φ	Upto 300 mm 300 mm to 600 mm	9.00 μ m 12.50 μ m	Using Electronic Height Gauge & Granite Surface Plate by Comparison Method
5. DEPTH MICROMETER LC.: 0.01 mm	Upto 150 mm	7.0 μ m	Using Slip Gauge Sets & Granite Surface Plate by Comparison Method
6. DEPTH GAUGE (VERNIER, DIGIMATIC) LC.: 0.01 mm Φ	Upto 300 mm 300 mm to 600 mm	9.00 μ m 13.00 μ m	Using Slip Gauge Sets Length Bars & Granite Surface Plate by Comparison Method
7. EXTERNAL & INTERNAL DIAL CALIPER LC.: 0.01 mm Φ	Upto 10 mm	8.93 μ m	Using Slip Gauge Sets by Comparison Method
8. DIAL THICKNESS GAUGE/PISTOL CALIPER LC.: 0.01 mm LC.: 0.1 mm	Upto 25 mm Upto 50 mm	5.92 μ m 57.8 μ m	Using Slip Gauge Sets by Comparison Method

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Convenor

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Page 3 of 9

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9. DIAL INDICATOR (PLUNGER) (INCLUDING DIGIMATIC)			
LC.: 0.001 mm ϕ	Upto 50 mm	2.5 μ m	Using Slip Gauge Sets & Granite Surface Plate by Comparison Method
LC.: 0.002 mm	Upto 5 mm	3.0 μ m	
10. DIAL INDICATOR (LEVER) (INCLUDING DIGIMATIC)			
LC.: 0.001 mm ϕ	Upto 1 mm	3.2 μ m	Using Slip Gauge Sets & Granite Surface Plate by Comparison Method
11. MEASURING SCALE			
LC.: 0.5 mm	Upto 1000 mm	290 μ m	Using measuring set up for scale & Tape calibration by Comparison Method
12. MEASURING TAPE			
LC.: 1 mm	Upto 1000 m	165 x $\sqrt{L/900}$ μ m	Using measuring set up for Scale & Tape calibration, 5 kg Weight, by Comparison Method
13. FEELER GAUGE	0.03 mm to 1 mm	3.9 μ m	Using External Micrometer by Comparison Method
14. HEGMAN GAUGE	0 to 1000 μ m	4.5 μ m	Using Electronic Height Gauge & Granite Surface Plate by comparison method

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Page 4 of 9

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15. FOILS	20 μ m to 2 mm	3.0 μ m	Using External Micrometer by Comparison Method
16. COATING THICKNESS GAUGE (INCLUDING DIGITAL	25 μ m 50 μ m 77 μ m 122 μ m 177 μ m 247 μ m 496 μ m 782 μ m	3.0 μ m 3.0 μ m 3.0 μ m 3.0 μ m 3.0 μ m 3.0 μ m 3.0 μ m 3.0 μ m	Using Standard Foils by Comparison Method
17. MICROMETER SETTING RODS	13 mm to 300 mm 300 mm to 600 mm	6 μ m 9.4 μ m	Using Electronic Height Gauge & Granite Surface Plate by Comparison Method
18. PLAIN PLUG GAUGE	2.5 mm to 100 mm	4.5 μ m	Using Electronic Height Gauge by Comparison Method
19. SNAP GAUGE/ PLAIN RING GAUGE	5 mm to 100 mm	4.5 μ m	Using Electronic Height Gauge by Comparison Method
20. CYLINDRICAL MEASURING PIN	1 mm to 10 mm	3.0 μ m	Using External Micrometer by Comparison Method
21. RADIUS GAUGE	0.5 mm to 25 mm	10.5 μ m	Using Profile Projector
22. THREAD PITCH GAUGE PITCH ANGLE	0.6 mm to 7 mm 60 °	6.8 μ m 3' of arc	Using Profile Projector by Comparison Method
23. TRI SQUARE	100 mm to 200 mm	2.2 min of arc	Using Profile Projector by Comparison Method

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Certificate Number C- 0370 Valid Until 23.04.2017

Last Amended on - Page 5 of 9

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24. BEVEL/ANGLE PROTRACTOR/ COMBINATION SET(INCLUDING DIGITAL)			
LC.: 1'	0° to 180°	2.3' of arc	Using Profile Projector
25. TEST SIEVE WIRE CLOTH/ PERFORATED PLATE WIRE CLOTH	53 μ m to 4 mm	6.5 μ m	Using Profile Projector by Comparison Method
PERFORATED PLATE	Above 4 mm to 125 mm	16.5 μ m	Using Digimatic Caliper by Comparison Method
II. MASS			
1. Weights	1mg	0.12 mg	Using Standard Weights of (E2 & F1) Class & Precision Balances Capable of M1 Class Calibration
	2 mg	0.12 mg	
	5 mg	0.12 mg	
	10 mg	0.12 mg	
	20 mg	0.12 mg	
	50 mg	0.12 mg	
	100 mg	0.16 mg	
	200 mg	0.19 mg	
	500 mg	0.10 mg	
	1 g	0.12 mg	
	2 g	0.14 mg	
	5 g	0.11 mg	
	10 g	0.11 mg	
	20 g	0.11 mg	
	50 g	0.13 mg	
	100 g	0.11 mg	

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Last Amended on -

Page 6 of 9

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Weights	200 g	0.67 mg	Using Standard Weights of (E2 & F1) Class & Precision Balances Capable of M1 Class Calibration
	500 g	0.01 g	
	1 kg	0.01 g	
	2 kg	0.011 g	
	5 kg	4.3 g	
	10 kg	4.3 g	
	20 kg	4.3 g	
2. WEIGHING MACHINE	0 to 200 g		Using Standard Weights of (E2 & F1) Class
	d = 0.01 mg	0.10 mg	
	d = 0.1 mg	0.10 mg	
	d = 1 mg	0.16 mg	
	0 to 5 kg	5 mg	
	d = 5 mg	10 mg	
	d = 10 mg	10 mg	
	d = 10 mg	18.8 mg	
	0 to 10 kg	55 mg	
	d = 50 mg	70 mg	
	0 to 30 kg		Using Standard Weights of (E2 & F1) Class
	d = 100 mg	550 mg	
	d = 500 mg	650 mg	
	d = 1 g	1 g	
	d = 5 g	350 g	

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Valid Until 23.04.2017

Last Amended on -

Page 7 of 9

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III. VOLUME

1. VOLUMETRIC

FLASKS/ MEASURING CYLINDERS/ MEASURING CONTAINERS/ WEIGHT PER LITRE CUP	Upto 100 ml 100ml to 500ml 500 ml to 1000 ml 1000 ml to 2000 ml	20 μ l 20 μ l 20 μ l 20 μ l	Using Standard Weights of (E2 & F1) Class Precision Balance & double distilled water of known density
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BURETTE PIPETTE (GRADUATED/ ONE MARK)	1 ml to 100 ml 0.5 ml to 100 ml	20 μ l 20 μ l	Using Standard Weights of (E2 & F1) Class Precision Balance & double distilled water of known density
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MICRO PIPETTE/ AUTO PIPETTE	100 μ l to 1000 μ l	0.3 μ l to 0.8 μ l	Using Standard Weights of (E2 & F1) Class Precision Balance & double distilled water of known density
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2.. SPECIFIC GRAVITY HYDROMETERS

LC.: 0.005 sp gr	0.700 sp gr to 2.000 sp gr	0.006 sp gr	Standard Specific Gravity Hydrometers by Comparison Method
LC.: 0.010 sp gr	0.700 sp gr to 2.000 sp gr	0.012 sp gr	

3. DENSITY HYDROMETERS

0.650 g/ml to 1.000 g/ml	0.0015 g/ml	Standard Density Hydrometers by Comparison Method
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Certificate Number C- 0370 **Valid Until** 23.04.2017

Last Amended on - **Page** 8 of 9

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IV. PRESSURE & VACUUM			
1. PRESSURE # DIGITAL/DIAL PRESSURE GAUGES (HYDRAULIC)	0 to 10 bar 10 bar to 700 bar	0.08 bar 3.15 bar	Using Digital Pressure calibrator and oil/ water based comparator as per procedure DKD R6-1
2. DIGITAL/DIAL PRESSURE GAUGES	0 to (-) 0.8 bar	0.0086 bar	Using Digital Pressure Calibrator and Vacuum Pump Comparator
3. DIGITAL/DIAL COMPOUND GAUGES	(-) 0.8 bar to 1.5 bar (-) 0.8 bar to 10 bar	0.0475 bar 0.064 bar	Using Digital Pressure Calibrator, vacuum pump & water based comparator
V. TORQUE			
1. TORQUE \$ TORQUE WRENCH (TYPE I, CLASS B & C) (TYPE II, CLASS A & B)	3 Nm to 20 Nm 20 Nm to 200 Nm 200 Nm to 1000 Nm	0.325 Nm 1 Nm 4.73 Nm	Digital Torque indicator with transducer using mechanized Torque Calibrator as per IS/ISO 6789:2003
VI. SPEED			
1. RPM \$ TACHOMETER (NON CONTACT TYPE)	100 rpm to 30000 rpm	1.3%	Using Digital Tachometer and LED type RPM Calibrator
2. RPM # Centrifuge	60 rpm to 30000 rpm	1.3%	Using Digital Tachometer

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Last Amended on - **Page** 9 of 9

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VII. FORCE			
1. UNIAXIAL TESTING MACHINES (UTM, CTM, TTM etc) *			
TENSION	100 N to 50 kN	0.20 %	Using Force Proving Instruments
COMPRESSION	2 kN to 600 kN	0.21 %	
VIII. HARDNESS			
1. BRINELL HARDNESS TESTER	HBW 10/3000	1.6%	Using Reference Blocks
2. VICKERS HARDNESS TESTER	HV5	2.9 %	Using Reference Blocks
	HV10	2.7 %	
	HV30	1.6 %	

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

\$Only in Permanent Laboratory

*Only for Site Calibration

Ⓞ 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.

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