

Laboratory Northlab India Pvt. Ltd.-Hosur (Plant-4), Plot No. 21, Phase-II, Hosur Valley Site, Viswanathapuram, Hosur, Tamil Nadu

Accreditation Standard ISO/IEC 17025:2005

Discipline Mechanical Calibration **Issue Date** 27.01.2014

Certificate Number C-1012 **Valid Until** 26.01.2016

Last Amended on - **Page** 1 of 11

Quantity Measured/ Instrument	Range / Frequency	*Calibration Measurement Capability (\pm)	Remarks
I. DIMENSION			
1. CALIPER \$ (Digital/Dial/ Vernier)			
L.C. 0.01 mm	0 to 600 mm	12.5 μ m	Using Gauge Block Set & Long Slip Gauges as per IS 3651 (Part 2) / JIS B 7507
L.C. 0.01 mm	0 to 1000 mm	15 μ m	
L.C. 0.02 mm	0 to 2000 mm	29.5 μ m	
L.C. 0.02 mm	0 to 3000 mm	35 μ m	
2. HEIGHT GAUGE \$ (Digital/Dial/ Vernier)			
L.C. 0.01 mm	0 to 300 mm	7.6 μ m	Using Gauge Block Set & Long Slip Gauges as per IS 2921
	0 to 600 mm	10.7 μ m	
L.C. 0.02 mm	Up to 1000 mm	20.0 μ m	
L.C. 0.05 mm	0 to 1500 mm	41.0 μ m	
3. DEPTH GAUGE \$ (Digital/ Vernier)			
L.C 0.01 mm	0 to 600 mm	10.0 μ m	Using Gauge Block Set & Long Slip Gauges as per IS 4213

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Accreditation Standard ISO/IEC 17025:2005

Discipline Mechanical Calibration **Issue Date** 27.01.2014

Certificate Number C-1012 **Valid Until** 26.01.2016

Last Amended on - **Page** 2 of 11

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4. EXTERNAL MICROMETER^s			
L.C 0.001 mm	0 to 50 mm	1.0 μ m	Using Gauge Block Set & Long Slip Gauges as per IS 2967
L.C 0.001 mm	50mm to 100 mm	1.3 μ m	
L.C 0.001 mm	100mm to 300 mm	3.35 μ m	
L.C 0.001 mm	300mm to 600 mm	8.0 μ m	
L.C 0.01 mm	600mm to 1200 mm	18.3 μ m	
L.C 0.01 mm	1200mm to 1800 mm	19.0 μ m	
5. MICROMETER SETTING ROD^s	25mm to 100 mm 100mm to 600 mm 600mm to 1800 mm	2.8 μ m 10.4 μ m 11.0 μ m	Using Gauge Block Set, Long Slip Gauges & Dial Test Indicator as per IS 2967
6. MICROMETER HEAD^s (DIGITAL/EXTERNAL)			
L.C 0.001 mm	0 to 50 mm 50mm to 100 mm	1.64 μ m 2.0 μ m	Using Gauge Block Set & Long Slip Gauges IS 9483
7. PITCH MICROMETER^s (Traverse of Screw)			
L.C 0.001 mm	0 to 100 mm	1.3 μ m	Using Gauge Block Set & Long Slip Gauges as per IS 2967
L.C 0.01 mm	0 to 300 mm	8.0 μ m	

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Accreditation Standard ISO/IEC 17025:2005

Discipline Mechanical Calibration **Issue Date** 27.01.2014

Certificate Number C-1012 **Valid Until** 26.01.2016

Last Amended on - **Page** 3 of 11

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8. GROOVE MICROMETER ^s L.C 0.01 mm	0 to 100 mm	6.0 μ m	Using Gauge Block Set as per IS 2966
9. DEPTH MICROMETER ^s (Digital/Dial/ External) L.C 0.001 mm	0 to 150 mm	5.3 μ m	Using Gauge Block Set & Long Slip Gauges as per IS 4213 / JIS B 7544
10. INSIDE MICROMETER ^s (Stick / Tubular Type) L.C 0.01 mm	13 mm to 500 mm	10.0 μ m	Using Gauge Block Set, Long Slip Gauges & Dial Test Indicator as per IS 2966
(Caliper Type) L.C 0.001 mm	0 to 50 mm	3.0 μ m	Using Gauge Block Set & Accessories Set
L.C 0.01 mm	50mm to 100 mm	6.7 μ m	as per IS 2966
11. PLUNGER DIAL/ DIGITAL DIAL GAUGE ^s L.C 0.001 mm	0 to 25 mm	1.52 μ m	Using Dial Calibration Tester
L.C 0.01 mm	0 to 100 mm	6.7 μ m	as per IS 2092
12. DIAL COMPARATOR ^s STAND (Flatness)	0 to 100 mm	2.55 μ m	Using Lever Dial as per IS 7599

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Accreditation Standard ISO/IEC 17025:2005

Discipline Mechanical Calibration **Issue Date** 27.01.2014

Certificate Number C-1012 **Valid Until** 26.01.2016

Last Amended on - **Page** 4 of 11

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13. DIGITAL /DIAL THICKNESS GAUGE^{\$}			
L.C 0.001 mm	0 to 1 mm	1.0 μ m	Using Gauge Block Set as per IS 2092
L.C 0.01 mm	0 to 25 mm	6.0 μ m	
14. LEVER DIAL GAUGE^{\$}			
L.C 0.001 mm	0 to 0.14 mm	3.27 μ m	Using Dial Calibration Tester as per IS 11498
L.C 0.002 mm	0 to 0.6 mm	2.3 μ m	
L.C 0.01 mm	0 to 1.6 mm	4.35 μ m	
15. DIAL BORE GAUGE^{\$} (Transmission error)	0 to 3 mm	4.2 μ m	Using Dial Calibration Tester as per IS 2966/2092
16. STEEL SCALES^{\$}			
L.C. 0.5 mm	0 to 2000 mm	$120 \sqrt{\left(\frac{L}{100}\right)} \mu\text{m}$ L in mm	Using Profile Projector as per IS 1481
17. MEASURING TAPE^{\$}			
L.C. 0.1 mm	0 to 5 m	$489\sqrt{L} \mu\text{m}$ L in m	Using Steel Rule as per IS 1269 (Part 1 & 2)
L.C. 1 mm	0 to 30 m	$489\sqrt{L} \mu\text{m}$ L in m	

Laboratory Northlab India Pvt. Ltd.-Hosur (Plant-4), Plot No. 21, Phase-II, Hosur Valley Site, Viswanathapuram, Hosur, Tamil Nadu

Accreditation Standard ISO/IEC 17025:2005

Discipline Mechanical Calibration **Issue Date** 27.01.2014

Certificate Number C-1012 **Valid Until** 26.01.2016

Last Amended on - **Page** 5 of 11

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18. TAPER SCALE ^{\$} L.C. 0.1 mm	1mm to 15 mm	17.0 μ m	Using Profile Projector as per IS 1481
19. BEVEL PROTRACTOR/ COMBINATION SET ^{\$}	0 to 180 deg	4 arc min	Using Angle Gauge Blocks as per IS 4239
20. THICKNESS FOILS ^{\$} L.C 0.001 mm	0 to 8000 μ m	2.91 μ m	Using Dial Thickness Gauge as per IS 3179
21. VEE BLOCK ^{\$} (Flatness, Parallelism, Angle)	450mm(L)X150mmX150 mm	7.3 μ m	Using Dial Test Indicator & Test Manral as per IS 4960
22. CYLINDRICAL MEASURING PIN ^{\$}	0.5mm to 20 mm	3.1 μ m	Using Gauge Blocks & Dial Indicator as per IS 11103
23. PLAIN PLUG GAUGE ^{\$}	Upto 50 mm 50mm to 150 mm	2.5 μ m 3.3 μ m	Using Gauge Blocks & Dial Indicator as per IS 6137/ 6244/ 3455
24. THREAD PLUG GAUGE ^{\$}	Upto M 50 M50 to M150	2.3 μ m 5.0 μ m	Using Digimatic Micrometer & Thread Measuring Wire Set as per IS 4218

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Accreditation Standard ISO/IEC 17025:2005

Discipline Mechanical Calibration **Issue Date** 27.01.2014

Certificate Number C-1012 **Valid Until** 26.01.2016

Last Amended on - **Page** 6 of 11

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25. FEELER GAUGE ^{\$}	Upto 1 mm	4.6 μ m	Using Digimatic Micrometer as per IS 3179
26. GAP GAUGE / SNAP GAUGE/LIMIT GAUGE ^{\$}	3 mm to 50 mm 50 mm to 100 mm 100 mm to 300 mm	1.7 μ m 2.4 μ m 6.3 μ m	Using Gauge Block Set as per IS 3477
27. RADIUS GAUGE ^{\$}	0.4 mm to 25 mm	14.0 μ m	Using Profile Projector as per IS 5273
28. PITCH GAUGE ^{\$}	0.35 mm to 7 mm	14.0 μ m	Using Profile Projector as per IS 4211
29. TEST SIEVES ^{\$}	0.032 mm to 125 mm	15 μ m	Using Profile Projector as per IS 460 (Part 1,2,3)
30. SINE BAR ^{\$}	0 to 90 ⁰	1.5 arc min	Using Angle Gauges & Microheight probe as per IS 5359
31. OCULAR/ GRATICULE ^{\$}	Angle: 360 ⁰ Linear: 25 mm	2.8 min 16 μ m	Using Profile Projector as per IS 5257
32. 2D HEIGHT MASTER / MICRO HEIGHT ^{\$} LC 0.0001 mm	Upto 300 mm Upto 600 mm	3.0 μ m 6.15 μ m	Using Gauge Block Set & Long Slip Gauges as per IS 2921

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Accreditation Standard ISO/IEC 17025:2005

Discipline Mechanical Calibration **Issue Date** 27.01.2014

Certificate Number C-1012 **Valid Until** 26.01.2016

Last Amended on - **Page** 7 of 11

Quantity Measured/ Instrument	Range / Frequency	*Calibration Measurement Capability (±)	Remarks
33. ULTRASONIC THICKNESS GAUGE	1mm to 100mm	56 µm	Using Gauge Blocks as per IS 15468
34. 2D HEIGHT GAUGE* (Digital/Dial/ Vernier) L.C 0.0001 mm	0 to 600 mm	6.15 µm	Using Gauge Block Set & Long Slip Gauges as per IS 2921
35. PROFILE PROJECTOR/ VIDEO MEASURING MACHINE* Linear Angle Magnification L.C. 0.001 mm	300 X 200 mm 360 deg Upto 100X	14.4 µm 10.4 arc min 0.8%	Using Glass Scale Angle Gauges Gauge Block Set
36. MICROSCOPE* Linear Magnification L.C 0.001 mm	0 to 300 mm Upto 100X	14 µm 1.3%	Using Glass Scale Gauge Block Set as per JIS B 7153
37. SURFACE PLATE*	2500 mm X 1600 mm	$1.7x \sqrt{\frac{L+W}{200}} \mu\text{m}$ L and W are in mm	Using Spirit Level as per IS 7327 / 2285

II. ACCELERATION & SPEED

1. RPM INDICATORS* (Non-Contact Types)	30rpm to 500rpm 500rpm to 20000rpm	0.6% Readings 0.6% Readings	Using Non-Contact Type Tachometer SANAS Criteria TR45-
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Accreditation Standard ISO/IEC 17025:2005

Discipline Mechanical Calibration **Issue Date** 27.01.2014

Certificate Number C-1012 **Valid Until** 26.01.2016

Last Amended on - **Page** 8 of 11

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2. RPM ^s	10 rpm to 99999 rpm	0.11 rpm to 92 pm	Using Pulse Generator & Frequency Counter by Direct Method
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III. TORQUE

1. TORQUEWRENCH / DRIVERS/ METERS / MULTIPLIERS Type 1 Class A,B,C,D,E Type 2 Class A,B,C,D,E,F,G	0.2 Nm to 10 Nm > 10 Nm to 80 Nm > 80 Nm to 779 Nm > 779 Nm to 3000 Nm	0.95% of rdg 1.4% of rdg 0.64% of rdg 1.5% of rdg	Using Static Transducer & Torque Tool Tester as per ISO 6789:2003
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IV. FORCE

1. PUSH PULL GAUGE	50N to 1000 N	0.36% of rdg	Using F1 class SS Weights & Push-Pull Bench as per ASTM E4-13
2. TENSION GAUGE	Upto 550 cN	0.38% of rdg	Using F1 class SS Weights

V. HARDNESS

1. HARDNESS TESTER Shore A	Upto 100 % SHA	0.6 % of SHA	Using F1 class SS Weights
Shore D	Upto 100 % SHD	0.6 % of SHD	as per ISO 18898:2012

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Accreditation Standard ISO/IEC 17025:2005

Discipline Mechanical Calibration **Issue Date** 27.01.2014

Certificate Number C-1012 **Valid Until** 26.01.2016

Last Amended on - **Page** 9 of 11

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VI. MASS^{\$}

1. CALIBRATION OF WEIGHTS

F1 Class or Coarser weights

1 mg	0.007 mg	Using E2 Class 1 mg to 2 g weights and Electronic Balance of Resolution 0.0000001g as per OIML R 111
2 mg	0.007 mg	
5 mg	0.007 mg	
10 mg	0.008 mg	
20 mg	0.01 mg	
50 mg	0.013 mg	
100 mg	0.017 mg	
200 mg	0.02 mg	
500 mg	0.027 mg	
1 g	0.03 mg	
2 g	0.04 mg	Using E2 Class 5g to 50g weights and Electronic Balance of Resolution 0.01mg as per OIML R 111
5 g	0.053 mg	
10 g	0.067 mg	
20 g	0.083 mg	
50 g	0.1 mg	
100 g	0.17 mg	Using E2 Class 100g to 200g weights and Electronic Balance of Resolution 0.1mg as per OIML R 111
200 g	0.33 mg	
2 kg	3.33 mg	Using E2 Class 2000g Weights and Electronics Balance of Resolution 1mg as per OIML R 111

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Accreditation Standard ISO/IEC 17025:2005

Discipline Mechanical Calibration **Issue Date** 27.01.2014

Certificate Number C-1012 **Valid Until** 26.01.2016

Last Amended on - **Page** 10 of 11

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F2 Class or Coarser weights	500 g	2.7 mg	Using E2 Class 500g to 1000g Weights and Electronics Balance of Resolution 1mg as per OIML R 111
	1 kg	5.4 mg	
M2 Class or Coarser weights	5 kg	8.33 mg	Using E2 Class 5000g Weights and Electronics Balance of Resolution 10mg as per OIML R 111
	10 kg	0.54 g	
M1 Class or Coarser weights	20 kg	0.34 g	Using F1 Class 10000g Weights and Electronic Balance of Resolution 100 mg as per OIML R 111
2. ELECTRONIC WEIGHING BALANCE*	Up to 2 g	0.07 mg	Using E2 Class Weights
	2 g to 320 g	0.73 mg	
	0.3 kg to 2 kg	4.1 mg	
	2 kg to 25 kg	161 mg	Using E2 and F1 Class Weights
	25 kg to 30 kg	1465 mg	Using M2 Class Brass & Cast Iron Weights

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Accreditation Standard	ISO/IEC 17025:2005		
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Certificate Number	C-1012	Valid Until	26.01.2016
Last Amended on	-	Page	11 of 11

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VII. VOLUME & DENSITY^{\$}			
1. HYDROMETERS/ ALCOHOLMETERS	0.65 g/ml to 1.20 g/ml	0.0020 g/ml	Using Calibration of Glass hydrometers/ alcoholmeters by comparison method
	1.20 g/ml to 1.30 g/ml	0.0010 g/ml	
	1.30 g/ml to 1.40 g/ml	0.0015 g/ml	
	1.40 g/ml to 1.60 g/ml	0.0010 g/ml	
2. PIPETTES, BURETTES, MEASURING CYLINDERS, STANDARD FLASK, GRADUATED JAR, PISTON OPERATED APPARATUS	1 mL to 10 mL	8 μ l	Using E2 Class Weights and Electronics Balance
	10 mL to 220 mL	35 μ l	
	220 mL to 1000 mL	1 ml	
	1000 mL to 2000 mL	14.5 ml	
	2000 mL to 5000 mL	16.7 ml	
3. MICROPIPETTES / PISTON OPERATED VOLUMETRIC APPARATUS	0.5 μ l to 1 μ l	0.09 μ l	Using Ultra micro balance/ Analytical balance & double distilled water as per ISO 8655-6
	> 1 μ l to 100 μ l	0.37 μ l	
	> 100 μ l to 1 ml	0.83 μ l	
	> 1 ml to 10 ml	8 μ l	

* 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.