

Laboratory Vasals Engineering Industries, No. 33, First Floor, Govardhan Garden,
J.C. Industrial Area, Kanakapura Road, Yelachenahalli, Bangalore,
Karnataka

Accreditation Standard ISO/IEC 17025:2005

Discipline Mechanical Calibration **Issue Date** 24.06.2015

Certificate Number C-0445 **Valid Until** 23.06.2017

Last Amended on 01.06.2015 **Page** 1 of 8

Quantity Measured/ Instrument	Range / Frequency	*Calibration Measurement Capability (\pm)	Remarks
I. DIMENSION			
1. PLAIN PLUG GAUGE \$	1 mm to 50 mm 100 mm to 200 mm	2.2 μ m 4.2 μ m	Using LVDT Probe “0” Grade Gauge Blocks by Comparison Method
2. THREAD PLUG GAUGE \$	2 mm to 150 mm	3.8 μ m	Using ULM by Comparison Method
3. TAPER PLAIN PLUG GAUGE \$	1 mm to 150 mm Half Taper Angle: 15 °	3.0 μ m 27.8 Arc s	Using ULM by Comparison Method
4. TAPER THREAD PLUG GAUGE \$	2 mm to 100 mm	3.0 μ m	Using ULM by Comparison Method
5. PLAIN RING GAUGE \$	Ø 10 mm to 150 mm	3.0 μ m	Using ULM by Comparison Method
6. THREAD RING GAUGE \$	Ø 10 mm to 200 mm	3.4 μ m	Using ULM by Comparison Method
7. TAPER PLAIN RING GAUGE \$	Ø 10 mm to 150 mm Half Taper Angle: 15 °	4.0 μ m 28.0 Arc s	Using ULM by Comparison Method
8. TAPER THREAD RING GAUGE \$	10 mm to 100 mm	3.5 μ m	Using ULM by Comparison Method
9. SNAP GAUGE \$	2 mm to 150 mm	2.8 μ m	Using Grade “0” Gauge Blocks by Comparison Method

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Convenor

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10. FEELER GAUGE & THICKNESS STANDARDS \$	Upto 2mm	2.8 μ m	Using LVDT Probe by Comparison Method
11. BOREGAUGE (Transmission Accuracy) \$	6 mm to 600 mm	3.3 μ m	Using Dial Calibration Tester by Comparison Method
12. DIAL THICKNESS GAUGE \$ L.C.: 0.001mm Φ	0 to 10mm	2.0 μ m	Using Grade "0" Gauge Blocks by Comparison Method
13. RADIUS GAUGES \$	1.0 mm to 25.0 mm	4.2 μ m	Using Profile Projector by Comparison Method
14. PITCH GAUGE \$	0.25 mm to 6 mm	4.1 μ m	Using Profile Projector by Comparison Method
15. COATING THICKNESS GAUGE \$ L.C.: 0.001 mm	Upto 2000 μ m	3.1 μ m	Using Thickness Standards
16. VERNIER DEPTH GAUGE \$ L.C.: 0.01 mm Φ	0 to 300 mm	10.5 μ m	Using Grade "0" Gauge Blocks by Comparison Method
17. VERNIER HEIGHT GAUGE (DIAL/DIGITAL) \$ L.C.: 0.01 mm Φ L.C.: 0.01 mm	0 to 600 mm 0 to 1000 mm	11.0 μ m 12.0 μ m	Using Caliper Checker & Grade "0" Gauge Blocks by Comparison Method

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18. CALIPERS (VERNIER/ DIAL/ DIGITAL) \$ L.C.: 0.01 mm Φ L.C.: 0.01 mm	0 to 600mm 0 to 1000mm	12 μ m 13 μ m	Using Grade "0" Gauge Blocks by Comparison Method
19. OUTSIDE CALIPER (Dial/DIGITAL/ Type) \$ L.C.: 0.01 Φ	Upto 300mm	6.0 μ m	Using Grade "0" Gauge Blocks by Comparison Method
20. PISTOL CALIPER \$ L.C.: 0.01 mm Φ	Upto 100 mm	6.2 μ m	Using Grade "0" Gauge Blocks by Comparison Method
21. INTERNAL DIAL CALIPERS (DIAL / DIGITAL) \$ L.C.: 0.01 mm Φ	Upto 300 mm	5.2 μ m	Using Grade "0" Gauge Blocks by Comparison Method
22. 3 POINT INTERNAL MICROMETER \$ L.C.: 0.001 mm Φ	\emptyset mm 6 to 150 mm	5.1 μ m	Using Setting Ring Gauge by Comparison Method
23. EXTERNAL MICROMETER \$ L.C.: 0.001 mm Φ L.C.: 0.001 mm	0 to 100 mm 100 to 300 mm	2.6 μ m 3.4 μ m	Using Grade "0" Gauge Blocks by Comparison Method

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24. DEPTH MICROMETER \$ L.C.: 0.001 mm ^Φ	0 to 300 mm	4.5 μ m	Using Grade "0" Gauge Blocks by Comparison Method
25. INTERNAL MICROMETER (2 point- Stick & Jaw Type) \$ L.C.: 0.01 mm	5 mm to 75 mm Upto 300 mm 300 mm to 500 mm 500 mm to 1000 mm	5.8 μ m 4.4 μ m 6.7 μ m 8.2 μ m	Using Grade "0" Gauge Blocks by Comparison Method
26. INDICATING MICROMETER \$ L.C.: 0.001 mm	Upto 100 mm	2.3 μ m	Using Grade "0" Gauge Blocks by Comparison Method
27. PLUNGER DIAL/ (ANALOG/DIGITAL) \$ L.C.: 0.001 mm L.C.: 0.01 mm	Up to 25 mm Up to 50 mm	3.5 μ m 6.6 μ m	Using Dial Calibration Tester by Comparison Method
28. DIAL GAUGESS \$ L.C.: 0.0005 mm	\pm 0.025 mm	1.5 μ m	Using ULM by Comparison Method
29. LEVER TYPE DIAL GAUGES \$ L.C.: 0.001mm L.C.: 0.01mm	0 to 0.14 mm 0 to 2 mm	3.0 μ m 6.6 μ m	Using Dial Calibration Tester by Comparison Method

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30. DIAL CALIBRATION TESTER/ DRUM TYPE \$ L.C.: 0.2 μm^{Φ} L.C.: 1.0 μm	0 to 25 mm 0 to 50 mm	1.8 μm 2.0 μm	Using ULM by Comparison Method
31. MICROMETER HEAD \$ L.C.: 1.0 μm	0 to 25 mm	2.0 μm	Using ULM by Comparison Method
32. ELECTRONIC PROBE \$ L.C.: 0.0001 mm L.C.: 0.001 mm	Up to 0.2 mm Up to 2 mm	1.0 μm 1.2 μm	Using ULM by Comparison Method
33. COMPARATOR STAND (Flatness) \$	Upto 300 mm	4.5 μm	Using Grade "0" Gauge Blocks & Granite Surface Plate by Comparison Method
34. BEVEL PROTRACTOR \$	0° to 360°	3.20 arc mins	Using Profile Projector by Comparison Method
35. COMBINATION SET \$	0° to 180°	21 arc mins	Using Profile Projector by Comparison Method
36. SINE BAR\$ (Angle)	0° to 60° Upto 300 mm	7.7 arc s	Using Angle Gauges Grade "0" Gauge Blocks by Comparison Method
37. SINE TABLE\$ (Angle)	Upto 300 mm	7.9 arc s	Using Angle Gauges Grade "0" Gauge Blocks by Comparison Method
38. "V" BLOCK \$ Parallelism Symmetry Squareness	Upto 200 mm Upto 200 mm Upto 200 mm	7.8 μm 7.2 μm 5.4 μm	Using Grade "0" Gauge Blocks Cylindrical Mandrel , Sine Table by Comparison Method

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39. CYLINDRICAL PINS / WIRES / BALLS \$	0.1 mm to 25 mm	1.0 μ m	Using LVDT Probe/ ULM/ Grade "0" Gauge Blocks by Comparison Method
40. TEST SIEVES \$ Wire Cloth Perforated Plate	0.05 mm to 4 mm 1 mm to 125 mm	5.2 μ m 15.0 μ m	Using Digital Vernier/ Profile Projector by Comparison Method
41. ENGINEER'S SQUARE \$ Perpendicularity Parallelism Flatness	Upto 750 mm Upto 750 mm Upto 750 mm	9.1 μ m 5.7 μ m 6.0 μ m	Using Angle square by Comparison Method
42. ANGLE PLATE \$ Squareness Parallelism Flatness	Upto 500 mm Upto 500 mm Upto 500 mm	9.2 μ m 6.2 μ m 5.8 μ m	Using Lever dial / Angle square by Comparison Method
43. STRAIGHT EDGE \$	Upto 1000 mm	10.0 μ m	Using Micro Dial, Gauge Granite Surface Plate by Comparison Method
44. ENGINEERING PARALLELS \$	Upto 300 mm	5.6 μ m	Using Grade "0" Gauge Blocks by Comparison Method
45. SPIRIT LEVEL / FRAME LEVEL \$ L.C.: 10 μ m /m L.C.: 20 μ m/m L.C.: 50 μ m/m	0.07 mm/m 0.24 mm/m 0.50 mm/m	14.5 μ m/m 19.6 μ m/m 31.8 μ m/m	Using Electronic Level by Comparison Method

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46. EXTENSION RODS HEIGHT BLOCKS \$	Upto 300 mm Upto 500 mm	3.2 μ m 3.9 μ m	Using LVDT Probe "0" Grade Gauge Blocks by Comparison Method
47. STEEL SCALE \$	0 to 1000 mm	(15 +L/100) μ m L' in mm	Using Profile Projector / Length Measuring Machine by Comparison Method
48. STEEL TAPE \$ L.C.: 0.1 mm L.C.: 1 mm	0 to 15 m	(25 +L/100) μ m 'L' in mm	Using Length Measuring Machine by Comparison Method
49. SURFACE PLATE # (Flatness) (Granite & Cast iron)	6000 mm x 2000 mm	$1.5 \sqrt{\frac{L+W}{B}}$ L & W in mm	Using Electronic Level by Comparison Method
50. 2-D ELECTRONIC HEIGHT MASTER # L.C.: 0.1 μ m	Upto 600 mm/0.1 μ m	3.0 μ m	Using "0" Grade Gauge blocks by Comparison Method
51. EXTENSOMETER # (Analog and Digital) Gauge Length Stroke	650 mm 50 mm	3.4 μ m	Using Dial Calibration Tester by Comparison Method
52. UNIVERSAL LENGTH MEASURING MACHINE # L.C.: 0.1 μ m L.C.: 0.1 μ m	Upto 100 mm Upto 500 mm	0.8 μ m 4.3 μ m	Using "0" Grade Gauge blocks by Comparison Method

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53. LENGTH MEASURING MACHINE # L.C.: 0.001mm	0 to 1000 mm	(2.2 +L /200) μ m 'L' in mm	Using "0" Grade Gauge blocks by Comparison Method

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

^{\$}Only in Permanent Laboratory

^Ø 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.

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