

**Laboratory**                      **PAP Works, 18/1, Main Road, TVS Nagar, Padi, Chennai, Tamil Nadu**  
**Accreditation Standard**    **ISO/IEC 17025: 2005**  
**Certificate Number**         **CC-2384 (In lieu of C-0972)**                      **Page**                      **1 of 6**  
**Validity**                            **18.09.2017 to 17.09.2019**                      **Last Amended on 12.10.2017**

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability ( $\pm$ )	Remarks
<b><u>ELECTRO-TECHNICAL CALIBRATION</u></b>				
<b>I.</b>	<b>SOURCE</b>			
1.	Temperature Simulation#  Thermocouple 'J' Type 'K' Type 'R' Type 'S' Type 'T' Type 'N' Type 'B' Type 'E' Type  RTD Pt-100	0 °C to 750 °C (-)100 °C to 1360 °C 0 °C to 1750 °C 0 °C to 1750 °C 0 °C to 400 °C (-)200 °C to 1300 °C 600 °C to 1800 °C 0 °C to 760 °C  (-)100 °C to 800 °C	0.89 °C 1.23 °C 3.65 °C 4.74 °C 2.13 °C 1.38 °C 3.43 °C 1.34 °C  0.68 °C	Using YEW make CA 71 Multifunction Calibrator by Direct Method
2.	Time Interval#	10 sec to 2 hrs	0.39 sec to 43.2 sec	Using TWIX-2 Digital Timer by Comparison Method

**Shally Sharma**  
**Convenor**

**Avijit Das**  
**Program Director**

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Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability ( $\pm$ )	Remarks
<b><u>MECHANICAL CALIBRATION</u></b>				
1.	Calipers <sup>§</sup> (Vernier/Dial/Digital) L.C: 0.01 mm	Up to 600 mm	14.40 $\mu$ m	Using Gauge Blocks & Caliper Checker By Comparison Method
2.	Depth Gauge <sup>§</sup> (Vernier/Dial/Digital) L.C: 0.01 mm	Up to 300 mm	9.50 $\mu$ m	Using Gauge Blocks By Comparison Method
3.	External Micrometer <sup>§</sup> L.C: 0.001 mm	Up to 100 mm > 100 mm to 300 mm > 300 mm to 500 mm	1.90 $\mu$ m 5.60 $\mu$ m 6.60 $\mu$ m	Using Gauge Blocks By Comparison Method
4.	Setting Gauge <sup>§</sup> (ROD)	Up to 500 mm	5.50 $\mu$ m	Using Gauge Blocks & 2D Height Gauge By Comparison Method
5.	Dial Gauge <sup>§</sup> (Lever Type) L.C: 0.001mm	Up to 2 mm	2 $\mu$ m	Using Universal Length Measuring Machine (ULM) By Comparison Method
6.	Dial Gauge <sup>§</sup> (Plunger Type) L.C: 0.001mm L.C: 0.01mm	Up to 50 mm Up to 100 mm	2.70 $\mu$ m 6.80 $\mu$ m	Using ULM By Comparison Method

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Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability ( $\pm$ )	Remarks
7.	Plain Plug Gauge <sup>§</sup>	Up to $\varnothing$ 100 mm > $\varnothing$ (100 to 200) mm > $\varnothing$ (200 to 300) mm	1.90 $\mu$ m 2.00 $\mu$ m 2.50 $\mu$ m	Using Gauge Blocks/ Electronic Comparator/ ULM By Comparison Method
8.	Snap Gauge/ Width Gauge/ Gap Gauge <sup>§</sup>	Up to $\varnothing$ 100 mm > $\varnothing$ (100 to 200) mm > $\varnothing$ (200 to 300) mm	3 $\mu$ m 4.2 $\mu$ m 5.8 $\mu$ m	Using Gauge Blocks By Comparison Method
9.	Depth Micrometer/ Depth Dial Gauge <sup>§</sup> L.C: 0.001mm	Up to 300 mm	6.8 $\mu$ m	Using Gauge Blocks By Comparison Method
10.	Micrometer Head <sup>§</sup> L.C: 0.001mm	Up to 50 mm	2 $\mu$ m	Using ULM By Comparison Method
11.	Internal/Stick Micrometer <sup>§</sup> L.C: 0.001 mm	Up to 300 mm	6.4 $\mu$ m	Using Gauge Blocks/ Caliper Checker/ Gauge Block Accessories By Comparison Method
12.	Height Gauge <sup>#</sup> (Vernier/Dial/ Digital/Electronic) L.C: 0.001 mm	Up to 600 mm	12.7 $\mu$ m	Using Gauge Blocks / Caliper Checker / Gauge Block Accessories By Comparison Method
13.	Bore Gauge <sup>§</sup> (For Transmission) L.C: 0.001 mm	Up to 2 mm	4.3 $\mu$ m	Using ULM By Comparison Method

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Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability ( $\pm$ )	Remarks
14.	Thickness Gauge <sup>s</sup> (Dial/Digital) L.C: 0.001mm	Up to 50 mm	1.3 $\mu$ m	Using Gauge Blocks By Comparison Method
15.	Inside/Outside Dial Caliper <sup>s</sup>	Up to 50mm	6 $\mu$ m	Using Gauge Blocks & Gauge Block Accessories By Comparison Method
16.	Measuring Pin <sup>s</sup>	Up to 20 mm	2.6 $\mu$ m	Using ULM By Comparison Method
17.	Cylindrical Setting Master <sup>s</sup>	Up to $\varnothing$ 50mm > $\varnothing$ (50 to 100) mm	1.6 $\mu$ m 2.1 $\mu$ m	Using ULM By Comparison Method
18.	Plain Ring Gauge <sup>s</sup>	$\varnothing$ 6mm to $\varnothing$ 100mm > $\varnothing$ (100 to 200) mm > $\varnothing$ (200 to 300) mm	3.4 $\mu$ m 3.5 $\mu$ m 3.8 $\mu$ m	Using ULM & Master Setting Ring By Comparison Method
19.	Thread Plug Gauge <sup>s</sup>	$\varnothing$ 2mm to $\varnothing$ 100mm > $\varnothing$ (100 to 150) mm	2.6 $\mu$ m 4.5 $\mu$ m	Using ULM & Thread Measuring Wires By Comparison Method
20.	Thread Ring Gauge <sup>s</sup>	$\varnothing$ 10mm to $\varnothing$ 100mm	2.4 $\mu$ m	Using ULM & Master Setting Ring By Comparison Method
21.	V-Block <sup>s</sup> (Parallelism & Symmetry)	Up to 200mm	5.8 $\mu$ m	Using Electronics Probe & Test Mandrel By Comparison Method
22.	Coating Thickness Gauge <sup>s</sup> L.C: 0.0001 mm L.C: 0.001 mm	Up to 20 $\mu$ m 20 $\mu$ m to 1600 $\mu$ m	5.8 $\mu$ m 5.8 $\mu$ m	Using Master Foils By Comparison Method

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23.	Master Foils <sup>§</sup>	Up to 1600 $\mu$ m	3.8 $\mu$ m	Using Gauge Blocks/ Electronic Comparator By Comparison Method
24.	Feeler Gauge <sup>§</sup>	Up to 1.0 mm	2.7 $\mu$ m	Using Digital Micrometer
25.	Surface Plate <sup>#</sup> (Grade 1 & Coarser)	Up to (1600X1000) mm	$2.5\sqrt{\frac{W+L}{125}}$ $\mu$ m	Using Sprit Level L.C 20 $\mu$ m By Comparison Method
26.	Pistol Caliper <sup>§</sup> L.C: 0.01 mm	Up to 50 mm	7.4 $\mu$ m	Using Gauge Blocks by Comparison Method
27.	Comparator Stand <sup>§</sup>	Up to 3000 mm	3.7 $\mu$ m	Using Electronics Probe By Comparison Method
28.	Thread Measuring Cylinder <sup>§</sup>	0.17 mm to 6.35 mm	1.2 $\mu$ m	Using Gauge Blocks & Electronic Comparator By Comparison Method
29.	Flush Pin/ Depth Gauge <sup>§</sup>	Up to 300 mm	5.2 $\mu$ m	Using 2D-Height Gauge By Comparison
30.	Electronics / LVDT Probe <sup>§</sup> L.C: 0.0001 mm	Up to 100 mm	2 $\mu$ m	Using ULM By Comparison Method

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31.	Profile Projector* Linear Angle Magnification	0to 200 mm 0-360° Digital caliper	8.90 $\mu$ m 49 min 1.70 %	Using Linear Glass Scale & Angular Graticule By Comparison Method

\* 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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