Laboratory	**Sibali Instrument Works, Jagacha Mohiary Road, A.T. Ghosh Road Jn., P.O.- G.I.P. Colony, Howrah, West Bengal**		
Accreditation Standard	**ISO/IEC 17025: 2005**		
Certificate Number	**CC-2737**	**Page**	**1 of 9**
Validity	**22.06.2018 to 21.06.2020**	**Last Amended on**	**12.09.2019**

Sl.	Measurand or Reference Material/ Type of instrument or material to be calibrated or measured/ Quantity Measured / Instrument	Calibration or Measurement Method or procedure	Measurement range and additional parameters where applicable (Range and Frequency)	Calibration and Measurement Capability (CMC) (±)
	ELECTRO TECHNICAL CALIBRATION			
I.	**SOURCE**			
1.	DC Voltage[$]	Using Multi-Function Calibrator Zeal 5.5 by Direct Method	0.5 mV to 200 mV 200 mV to 2 V 2 V to 20 V 20 V to 200 V 200 V to 1000 V	1.90 % to 0.2 % 0.20 % to 0.04 % 0.04 % 0.04 % 0.04 % to 0.01 %
2.	AC Voltage[$]	Using Multi-Function Calibrator Zeal 5.5 by Direct Method	**50 Hz** 5 mV to 200 mV 200 mV to 2 V 2 V to 20 V 20 V to 200 V 200 V to 1000 V	 2.80 % to 0.31% 0.32 % to 0.24 % 0.24 % 0.24 % to 0.30 % 0.32 % to 0.12 %
3.	DC Current[$]	Using Multi-Function Calibrator Zeal 5.5 by Direct Method	0.2 mA to 2 mA 2 mA to 20 mA 20 mA to 200 mA 0.2 A to 2 A 2 A to 10 A	0.19 % to 0.1 % 0.1 % 0.09 % to 0.08 % 0.08 % to 0.50 % 0.50 % to 0.2 %
4.	AC Current[$]	Using Multi-Function Calibrator Zeal 5.5 by Direct Method	**50 Hz** 5 mA to 20 mA 20 mA to 200 mA 0.2 A to 2 A 2 A to 10 A	 0.20 % 0.20 % to 0.17 % 0.17 % to 0.68 % 0.68 % to 0.27 %

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5.	DC High Current[$]	Using Multi-Function Calibrator Zeal 5.5 & 100 Turn Current Coil by Direct Method	10 A to 500 A 500 A to 900 A	1.25 % to 1.00 % 1.50 %
6.	AC High Current[$]	Using Multi-Function Calibrator Zeal 5.5 & 100 Turn Current Coil by Direct Method	**50 Hz** 10 A to 500 A 500 A to 900 A	1.41 % to 1.20 % 1.80 %
7.	Resistance[$]	Using Decade Resistance box Zeal by Direct Method	1 Ω to 10 Ω 10 Ω to 10 MΩ 10 MΩ to 200 MΩ 200 MΩ to 1000 MΩ	0.78 % to 0.09 % 0.09 % to 0.05 % 0.05 % to 3.0 % 3.00 %
8.	Frequency[$] At Reference Voltage 3.5 V	Using Multi-Function Calibrator Zeal 5.5 & 100 Turn Current Coil by Direct Method	45 Hz to 1 kHz	0.66 %
9.	Temperature[$] (Simulation Method)			
	Thermocouple J Type K Type E type R type T Type RTD PT 100 Type	Temperature Source Kusum Meco KM-CAL 901 by Direct Method	(-) 199.9 °C to 999.9 °C (-) 199.9 °C to 1250 °C (-) 100 °C to 600.0 °C 100 °C to 1650 °C (-) 199.9 °C to 390 °C (-) 100 °C to 600 °C	2.24 °C 2.25 °C 2.29 °C 3.58 °C 2.24 °C 1.10 °C

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II.	**MEASURE**			
1.	DC High Voltage[$]	Using Multi Meter & HV Prove by Direct Method	5 kV to 29 kV	11.84 % to 4.32 %
2.	AC High Voltage[$]	Using Multi Meter & HV Prove by Direct Method	5 kV to 29 kV	12.54 % to 6.44 %
3.	Time[$]	Using Time Interval Meter by Comparison Method	5 sec to 3600 sec	0.65 % to 0.36 %

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	MECHANICAL CALIBRATION			
I.	**DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)**			
1.	Steel Scale[$] L.C. 1mm	Using Scale & Tape Calibrator by Comparison Method	0 to 1000 mm	280 µm
2.	Measuring Tape/Pie Tape[$] L.C. 1 mm	Using Scale & Tape Calibrator by Comparison Method	0 to 30 mtr	560√L µm L in mtr
3.	Pie tape[$]	Using Scale & Tape Calibrator by Comparison Method	60 to 950	560√L µm L in mtr
4.	Depth Vernier[$] L.C. 0.02 mm	Using Long Gauge Block Set, Surface Plate by Comparison Method	0 to 300 mm	17.2 µm
5.	Depth Micrometer[$] L.C. 0.01mm	Using Gauge Block Set , surface plate by Comparison Method	0 to 150 mm	8.6 µm

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6.	Bore Gauge [$] (Transmission Error) L.C. 0.001mm	Using Micrometer Holder & Stand by Comparison Method	0.01 mm to 2mm	6.9 µm
7.	Plunger Dial[$] L.C. 0.001mm	Using Gauge Block Set by Comparison Method	0 to 10 mm 0 to 50 mm	6.8 µm 8.2 µm
8.	Height Gauge[$] (Dial/Digital/Analog) L.C. 0.01mm	Using Long Gauge Block Set, Surface Plate by Comparison Method	0 to 600mm	14 µm
9.	Internal Micrometer / Stick Micrometer [$] L.C. 0.01mm	Using Long Gauge Block Set, Surface Plate, Slip Gauge Accessory Set by Comparison Method	50 mm to 1000 mm	11.20 µm
10.	External Micrometer[$] L.C. 0.001mm L.C. 0.01mm	Using Gauge Block Set / Long Gauge Block Set by Comparison Method	0 to 150 mm 150 mm to 225mm 0 to 600 mm	2.5 µm 4.0 µm 11.7 µm
11.	Feeler Gauge[$]	Using Digital Micrometer	0 to 1 mm	4.0 µm

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12.	Coating Thickness Gauge[$] L.C. 0.001mm	Using Master Thickness Foils Set	0.015mm to 1.2mm	5.7 µm
13.	Vernier Caliper[$] (Dial/Digital/Analog) L.C. 0.01mm L.C. 0.02mm	Using Long Gauge Block Set, Surface Plate, Slip Gauge Accessory Set	0 to 300 mm 0 to 1000mm	8.4 µm 20.7 µm
14.	Radios Gauge Set[$]	Using Profile Projector	R 0.6 to R 25	24.9 µm
15.	Thread Pitch Gauge[$]	Using Profile Projector	0.4mm to 6.0mm	18.7 µm
16	Bevel Protractor[$] L.C. 5 Min	Using Angle Gauge Block	0 – 90 °	4.1 Min
17	Test Sieves[$]	Using Profile Projector Using Digital Caliper	0.045 mm to 1mm 1.00mm to 25mm 25mm to 100 mm	4.7 µm 16.3 µm 21.6 µm
18.	Plain Plug Gauge[$]	ULM By Comparison Method	Up to 100 mm	1.6 µm
19.	Plain ring Gauge[$]	ULM and Master Ring Gauge By Comparison Method	5 mm to 100 mm	1.4 µm
20.	Thread Plug gauge[$]	Using ULM and Measuring wire set By Comparison Method	5 mm to 100 mm	2.0 µm
21.	Thread Ring gauge[$]	Using ULM and Master Ring Gauge By Comparison Method	5 mm to 100 mm	1.4 µm

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22.	Snap gauge/Gap Gauge[$]	Using ULM and Master Ring Gauge By Comparison Method	15 mm to 100 mm	1.2 µm
23.	Thickness Foil[$]	Using ULM By Comparison Method	Up to 1511 µm	0.8 µm
II.	**PRESSURE INDICATING DEVICES**			
1.	Vacuum Gauge[#] (Analog/Digital Gauges)	Using Digital Vacuum Gauge & Hand Pump Comparator	(-)0.85 to 0 bar	0.6 bar
2.	Pressure Gauge[#] (Analog/Digital Gauges)	Using Digital Pressure Gauge with Hydraulic Comparator	0 to 7 bar 0 to 600 bar	0.003 bar 3.96 bar
III.	**WEIGHTS**			
1.	Mass- Weights[$]	Using E_1 Class weights and balance of readability 0.1 mg & Calibration weights of Class F_2 accuracy and coarser as per OIML R-111	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	0.19 mg 0.19 mg 0.19 mg 0.19 mg 0.19 mg 0.19 mg 0.19 mg 0.12 mg 0.12 mg 0.12 mg 0.12 mg 0.12 mg 0.12 mg 0.12 mg 0.12 mg 0.11 mg 0.25 mg

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IV.	**VOLUME**			
1.	Glassware like Pipettes, Burettes, Measuring Cylinder, Volumetric Flask[$] etc.	Using Weighing balance of 80 g/ 220 g capacity and 0.01 mg / 0.1 mg readability and distilled water	1 ml to 100 ml @ 27 °C	0.25 ml
V.	**WEIGHING SCALE AND BALANCE**			
1.	Mass- Electronic weighing balances with readability [$]			
	d=0.1 mg	Using E_1 Class weights & Calibration of electronic weighing balance and comparator of Class I and coarser As per OIML R-76-1	Maximum capacity up to 200g	0.20mg
	d=5 g	Using M_1 class weights & Calibration of electronic weighing balance and Comparator of Class III and coarser As per OIML R-76-1	Maximum capacity up to 5000 g	3 g
VI.	**ACCELERATION AND SPEED**			
1.	Tachometer [*] (Contact Type)	Using Digital Tachometer with rpm source Using Digital Tachometer with rpm source	100 rpm to 3500 rpm	0.27% rdg
2.	Tachometer [*] (Non-Contact Type)	Using Digital Tachometer with rpm source Using Digital Tachometer with rpm source	10 rpm to 999999 rpm	0.24% rdg

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	THERMAL CALIBRATION			
I.	**TEMPERATURE**			
1.	Dial & Digital Temperature Gauge[$]	Using Dig. Thermometer with Pt-100 sensor, L.C-0.01 °C by Comparison method	(-) 20°C to 50°C	1.31 °C
2.	Dial & Digital Temperature Gauge[$]	Using Dig. Thermometer with R Type Thermocouple. L.C-0.1 °C by Comparison method	50°C to 900 °C	2.70 °C
3.	Dial & Digital Temperature Gauge[♣]	Using Digital thermometer with R-Type Thermocouple by Comparison method L.C- 0.1 °C	20°C to 650 °C	1.50 °C
II.	**SPECIFIC HEAT AND HUMIDITY**			
1.	Humidity[$]	Using Digital Humidity Indicator with sensor, L.C. 0.01 % RH using Humidity Chamber having controlling accuracy (±) RH by Comparison Method	40°C to 98 % RH	1.75 % RH

*** Measurement Capability is expressed as an uncertainty (±) 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.

Dheeraj Chawla
Convenor

Battal Singh
Program Manager