Laboratory	**Mayuresh Associates, 4080, 4078, 3077A, Bhandup Industrial Estate, Pannalal Compound, LBS Marg, Bhandup West, Mumbai, Maharashtra**
Accreditation Standard	**ISO/IEC 17025: 2005**
Certificate Number	**CC-2584** **Page 1 of 10**
Validity	**20.02.2018 to 19.02.2020** **Last Amended on 25.07.2018**

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
		ELECTRO-TECHNICAL CALIBRATION		
I.	**MEASURE**			
1.	DC Voltage$	1 mV to 100 mV 100 mV to 1000 V	1.1 % to 0.1 % 0.1 % to 0.05 %	Using Fluke Source with 5 ½ DMM Keysight 34450A by Direct / Comparison Method
2.	DC Current$	10 uA to 100 mA 100 mA to 2 A	0.8 % to 0.2 % 0.2 % to 0.5 %	Using Fluke Source with 5 ½ DMM Keysight 34450A by Direct / Comparison Method
		10 uA to 100 mA 100 mA to 10 A	0.8 % to 0.2 % 0.2 % to 0.5 %	Using 5 ½ DMM Keysight 34450A by Direct Method
3.	Resistance$	0.001 Ω to 1 Ω 1 Ω to 10 MΩ 1MΩ to 1 GΩ	0.7 % to 0.5 % 1.37 % to 0.2 % 0.2 % to 4.65 %	Using V/I Method Using Fluke Source with 5 ½ DMM Keysight 34450A and HP 3478A by Direct/Comparison Method Using HP 3456A DMM Direct Method
4.	AC Voltage$	**1 kHz** 10 mV to 100 mV 100 mV to 750 V	 2 % to 0.4 % 0.4 %	Using Fluke Source with 5 ½ DMM Keysight 34450A Direct / Comparison

Vishal Shukla
Convenor

Avijit Das
Program Director

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
5.	AC Current[$]	**1 kHz** 1 mA to 2 A	2.6 % to 1.2 %	Using Fluke Source with 5 ½ DMM Keysight 34450A by Direct / Comparison
		1 mA to 10 A	2.6 % to 1.2 %	Using 5 ½ DMM Keysight 34450A by Direct Method
6.	Frequency[$]	20 Hz to 300 kHz 300 kHz to 10 MHz	0.05 % 0.05 % to 0.03 %	Using Source with 5 ½ DMM Keysight 34450A and HP MA 130 Direct / Comparison
7.	Capacitance[$]	**1 kHz** 10 pF to 1 mF	3.76 % to 0.6 %	Using LCR meter 4262A Direct Method
8.	Inductance[$]	**1 kHz** 100 uH to 10 H	0.5 % to 0.6 %	Using LCR meter 4262A Direct Method
9.	AC Resistance[$]	**1 kHz** 1Ω to 10 kΩ	0.6 %	Using LCR meter 4262A Direct Method
10.	Temperature Simulation[#] (Temp Indicator/ Controller / Recorder)			
	RTD Thermocouple J Type K Type R Type B Type S Type T Type	(-) 200 ˚C to 600˚C (-) 200 ˚C to 1000 ˚C (-) 200 ˚C to 1200 ˚C 0 ˚C to 1600 ˚C 0 ˚C to 1600 ˚C 0 ˚C to 1600 ˚C (-) 200 ˚C to 400 ˚C	0.8 ˚C 1.0 ˚C 1.0 ˚C 1.7 ˚C 4.0 ˚C 1.7 ˚C 0.9 ˚C	Using Masibus Calibrator

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
11.	Digital Timer, Stop Watch#	5s to 2h 30min 2h 30 min to 24 h	0.18 to 2.5 s 2.5 to 21 s	Using Digital Timer
12.	AC High Voltage♣	**50 Hz** 1 kV to 10 kV	 5 %	Using Meco HV Probe & 4 ½ DMM

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
	MECHANICAL CALIBRATION			
I.	**MASS**			
1.	Weights (M1Class and Coarser)[$]	1 mg 2 mg 5 mg 10 mg 20 mg 50 mg 100 mg 200 mg 500 mg 1 g 2 g 5 g 10 g 20 g 50 g 100 g 200 g 500 g 1 kg 2 kg 5 kg	0.06 mg 0.06 mg 0.06 mg 0.04 mg 0.04 mg 0.08 mg 0.09 mg 0.09 mg 0.12 mg 0.12 mg 0.20 mg 0.15 mg 0.15 mg 0.18 mg 0.41 mg 0.3 mg 0.8 mg 8 mg 15 mg 20 mg 70 mg	Using E2 Class Weights & 1mg – 200g Weighing Balance of d=0.01mg / 0.1mg As per OIML R-111 by substitution method through ABBA cycles Using F2 Class Weights & Balance of Readability d=1mg upto 1 kg, d=10mg upto 5 kg, d=0.1g upto 15 kg As per OIML R-111 by substitution method through ABBA cycles
	Weights of M3-Class and Coarser[$]	10kg	1.6 g	

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
II.	**WEIGHING SCALE AND BALANCE**			
1.	Weighing Balance♣ d≥ 0.1mg	10 mg to 200 g	0.3 mg	Using Calibration of Class1 weighing balances and coarser as per R-76 using E2 class standard weights 1mg to 200g
	d≥ 0.01g d≥ 0.1g d≥ 100g	500 mg to 5 kg 20 g to 15 kg 2 kg to 300 kg	0.08 g 1.7g 100 g	Using Calibration of Class3 weighing balances and coarser as per R-76 using F1 class & M1 class standard weights up to 300 kg
III.	**VOLUME**			
1.	Volume Glassware (Pipette, Burette, Measuring Cylinder, Volumetric Flask)$	1ml ≤ V < 10 ml 10 ml ≤ V < 1000 ml 1000 ml ≤ V < 5000 ml	0.01 ml 0.05 ml 0.85 ml	Using Calibration of Glassware based on Gravimetric method as per ISO 4787 Method
2.	Micro Pipettes$	10 µl < V ≤ 100 µl 100 µl < V ≤ 1ml 1ml < V ≤ 10 ml	0.6 µl 1.4 µl 6.6 µl	Using Calibration of Micropipettes based on Gravimetric method as per ISO 8655 Method

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
IV.	**DENSITY**			
1.	Hydrometer$	0.600 g/ml to 2.000 g/ml	0.008 g/ml	Using Standard Hydrometer of Resolution 0.0005 g/ml and Appropriate Liquid by Comparison method as per Archimedes Principle based on IS 3104
V.	**ACCELERATION & SPEED**			
1.	Digital Tachometer$	10 RPM to 100 RPM 100 RPM to 100000 RPM	0.15 % to 0.06 %	Using Digital Tachometer by Comparison Method
2.	Tachometer/ Centrifuge♣	10 RPM to 100 RPM 100 RPM to 40000 RPM	0.15% to 0.06% RPM	Using Digital Tachometer by Comparison Method
VI.	**PRESSURE INDICATING DEVICES**			
1.	Pressure Gauge/Pressure Transmitter$	0 to 1 bar 0 to 10 bar 0 to 100 bar	0.007 bar 0.061 bar 0.61 bar	Using Digital Pressure Gauge by Comparison Method as per DKD R 6-1
2.	Pressure Gauge/Pressure Transmitter♣	0 to 10 bar 0 to 100 bar 0 to 600 kg/cm^2	0.061 bar 0.61 bar 4.43 bar	Using Digital Pressure Gauge by Comparison Method as per DKD R 6-1

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
3.	Low Pressure Gauge/ Magnehelic Gauge[$]	98.06 Pa to 1961.33 Pa	57.8 Pa	Using Digital Pressure Indicator by Comparison Method as DKD R 6-1
4.	Vacuum Gauge/ Vacuum Transmitter[#]	(-) 0.95 o 0 bar	0.013 bar	Using Digital Vacumm Gauge by Comparison Method as per DKD R 6-1

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
		THERMAL CALIBRATION		
I.	**TEMPERATURE**			
1.	PRT / RTD / Thermocouple Sensors with and without Indicator, Digital Thermometer[$]	(-) 80 °C to (-) 40 °C (-) 40 °C to 200 °C >200 °C to 600 °C @~ (-) 196 °C @~ 0 °C	0.81 °C 0.22 °C 0.59 °C 0.3 °C 0.082 °C	Using PRT with DMM, Liquid Comparator, Alcohol bath, Oil bath, Dry well calibrator, LN2 Comparator, Ice bath (Comparison Method)
2.	Glass Thermometer / Dial Thermometer[$]	(-) 80 °C to 500 °C	0.9 °C	Using PRT with DMM, Liquid Comparator, Alcohol bath, Oil bath, Liquid Tin bath (Comparison Method)
3.	Thermocouple Sensor with and without Indicator, Digital Thermometer[$]	>600 °C to <1000 °C 1000 °C to 1200 °C	2.8 °C 3.7 °C	Using R Type Thermocouple with DMM, Dry well Furnace
4.	Digital Thermo Hygrometer[$]	10 °C to 60 °C 30 % RH to 95 % RH	0.9 °C 4.6 % RH	Using PRT with DMM, Humidity Indicator with Sensor, Stability Chamber
5.	Humidity Sensor with Indicator[$]	15 % RH to 95 % RH (@25°C Approx)	3.4 %RH	Using Humidity Indicator with Sensor, Humidity Dessicators

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
6.	PRT / RTD / Thermocouple Sensors with and without Indicator, Digital Thermometer♣	50 °C to 600 °C	0.59 °C	Using PRT with DMM, Dry well bath
7.	Thermocouple Sensor with and without Indicator, Digital Thermometer♣	>600 °C to <1000 °C 1000 °C to 1200 °C	3.6 °C 3.6 °C	Using R type Thermocouple with DMM, Dry well Furnace
8.	Calibration of Temperature Indicator of Chamber (Liquid bath, Oil bath, Deep Freezer, Cooling cabinet, Incubator, Waterbath, Oven, Muffle Furnace, Autoclave) ♣	(-) 80 °C to 300 °C 300 °C to 1200 °C	0.9 °C 3.7 °C	Using PRT with DMM, R type Thermocouple with DMM, Single Probe Calibration
9.	Calibration of Chamber (Cooling cabinet, Incubator, Deep Freezer, Waterbath, Oven) ♣	(-) 80 °C to 300 °C	1.7 °C	Using Datalogger with Temperature Sensors (9-probe Calibration)
II.	**SPECIFIC HEAT AND HUMIDITY**			
1.	Calibration of Humidity Indicator of Chamber♣	30 % RH to 95 % RH (@25°C Approx)	4.7 % RH	Using Humidity Loggers, Single Probe Calibration

Laboratory	**Mayuresh Associates, 4080, 4078, 3077A, Bhandup Industrial Estate, Pannalal Compound, LBS Marg, Bhandup West, Mumbai, Maharashtra**		
Accreditation Standard	**ISO/IEC 17025: 2005**		
Certificate Number	**CC-2584**	**Page**	**10 of 10**
Validity	**20.02.2018 to 19.02.2020**	**Last Amended on**	**25.07.2018**

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
2 .	Humidity / Stability Chamber♣	30 % RH to 95 % RH (@25°C Approx)	7.26 % RH	Using Humidity Loggers, (9- probe Calibration)

*** 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.

Vishal Shukla
Convenor

Avijit Das
Program Director