Laboratory	**Shriram Institute For Industrial Research, 14-15, Sadarmangala Industrial Area, Whitefield Road, Bangalore, Karnataka**			
Accreditation Standard	**ISO/IEC 17025: 2005**			
Certificate Number	**CC-2083** ***(in lieu of C-0216, C-0304, C-1497)***		**Page**	**1 of 7**
Validity	**13.01.2017 to 12.01.2019**		**Last Amended on**	

Sl.	**Quantity Measured / Instrument**	**Range/Frequency**	***Calibration Measurement Capability (±)**	**Remarks**
	ELECTRO-TECHNICAL CALIBRATION			
I.	**MEASURE**			
1.	Time[$]	5 sec to 9900 sec	0.12 sec to 5.8 sec	Using Digital Time Totalizer
	(Digital Timer/Analog & Digital Stop Watch)			by Comparison Method

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Convenor

Avijit Das
Program Director

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
		MECHANICAL CALIBRATION		
I.	**WEIGHTS**			
1.	Mass[$] (F1 & Coarser)	1 mg	0.02 mg	Using Weights of Accuracy
		2 mg	0.02 mg	Class E1 & F1 and Precision
		5 mg	0.02 mg	Balances Analytical Balance
		10 mg	0.02 mg	by Substitution Method of
		20 mg	0.03 mg	Weighing and ABBA
		50 mg	0.03 mg	Weighing Cycle as
		100 mg	0.03 mg	per OIML R -111 2004
		200 mg	0.03 mg	
		500 mg	0.04 mg	
		1g	0.04 mg	
		2g	0.05 mg	
		5g	0.06 mg	
		10g	0.09 mg	
		20g	0.15 mg	
		50g	0.27 mg	
		100g	0.51 mg	
		200g	1.0 mg	
		500g	1.0 mg	
		1 kg	1.3 mg	
II.	**WEIGHING SCALE AND BALANCE**			
1.	Weighing Machine			
	d= 0.001 mg	0 to 200 g	0.005 mg	Using Weights of Accuracy
	d= 0.01 mg		0.05 mg	Class E1 based on
	d= 0.1 mg		0.4 mg	OIML R 76
	d= 1 mg	0 to 1 kg	5.3 mg	Using Weights of Accuracy
				Class E1 & E 2 based on OIML R 76

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
	d= 10 mg	0 to 5 kg	90 mg	Using Weights of Accuracy
	d= 100 mg		500 mg	Class E2, F1 & M1based on OIML R 76
	d= 1 g	0 to 20 kg	1.1 g	Using Weights of Accuracy Class E2, F1 & M1based on OIML R 76
	d= 10 g	0 to 150 kg	15 kg	Using Weights of Accuracy Class F1 & M1based on OIML R 76
III.	**VOLUME**			
1.	Piston Pipette[$]	>100 µl to 1000 µl >1000 µl to 5000 µl	0.28 µl 0.28 µl	Using Micropipette as per IS 8655-6 & ISO/TR 20461 and Digital Balance upto 200 g readability 0.01 mg and Distilled Water of known Density
2.	Glass Pipettes[$] (Graduated/ Non Graduated)	0.1 ml to 10 ml >10 ml to 50 ml	0.8 µl 3.8 µl	Using Digital Precision Balance and Distilled Water of known density as per ISO 4787 & ISO/TR 20461
3.	Glass Burette[$]	0.1 ml to 10 ml >10 ml to 50 ml	0.8 µl 3.8 µl	Using Digital Precision Balance and Distilled Water of known density as per ISO 4787 & ISO/TR 20461
4.	Measuring Cylinder/Volumetric Flask/Conical Flask / Beaker[$]	5 ml to 100 ml >100 ml to 500 ml >500 ml to 1000 ml	12.0 µl 60.0 µl 150.0 µl	Using Digital Precision Balance and Distilled Water of known density as per ISO 4787 & ISO/TR 20461

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
IV.	**VISCOSITY**			
1.	Rotational Viscometer[$]	10 to 100 cP 100 to 1000 cP 1000 to 15000 cP 15000 to 72000 cP	1.2 % 1.2 % 1.5 % 1.7 %	Using Dynamic/ Absolute viscosity of the standard oil is compared with the digital output of the viscometers as per standards ISO-2555, ISO 1652
2.	Ford Cup/ Flow cup[$]	10 cSt to 220 cSt 220 cSt to 1200 cSt	2.5 % 4.2 %	Using Standard Viscometer and oil as per IS 3944-1982 and ASTM D1200
V	**PRESSURE INDICATING DEVICES**			
1.	Pressure (Pneumatic) Analog/Digital Pressure Gauge/ Transducer/ Transmitters[#]	0.05 bar to 20 bar	0.16 % of reading	Using Pneumatic calibrator Budenberg E400 by Comparison Method as per DKD R 6.1
2.	Pressure (Hydraulic) Analog/Digital Pressure Gauge/ Transducer/ Transmitters[$]	1 bar to 60 bar 60 barto 700 bar	0.1 % of reading 0.16 % of reading	Using Dead weight tester Budenberg HX 480 By Comparison Method as per DKD R 6.1

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
3.	Negative Pressure Analog/Digital Vacuum Gauge/ Transducer/ Transmitters#	(-) 0.85 bar to 0 bar	1.15 % of reading	Using Pneumatic calibrator Budenberg E400 by Comparison Method as per ISO 3567
VI.	**ACCELERATION AND SPEED**			
1.	Speed/Non Contact Centrifuges♣	100 rpm to 25000 rpm	5.8 rpm to 58 rpm	Digital TachometerTACH 4A by comparison as per Sanas TR 45-01

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
		THERMAL CALIBRATION		
I.	**TEMPERATURE**			
1.	Glass Thermometers, PRT/RTD's Thermocouples With Indicator/Without Indicator, Oven[$]	(-)80 ^{0} C to 50 ^{0} C	0.11 ^{0} C	Using PRT, DTI, Low Temperature Bath &Ice Point by Comparison Method
		50 ^{0} C to 300 ^{0} C	0.12 ^{0} C	Using PRT, High Precision Bath, DTI by Comparison Method
		300 ^{0} C to 600 ^{0} C	0.5 ^{0} C	Using PRT, DTI, High Temperature Furnace by Comparison Method
		600 ^{0} C to 1200 ^{0} C	1.8 ^{0} C	Using S Type Thermocouple , High Temperature Furnace, DTI by Comparison Method
2.	Oven, Thermal Chambers, Deep Freezers, Refrigerator,Spatial Mapping	(-)80 ^{0} C to 300 ^{0} C	0.5 ^{0} C	Using PRT, DTI, T Type with DTI by Comparison Method
	Furnace (Single Point)	200 ^{0} C to 1200 ^{0} C	1.7 ^{0} C	Using S Type Thermocouple, DTI, by Comparison Method
	Thermocouples[♣]	100 ^{0} C to 300 ^{0} C 200 ^{0} C to 800 ^{0} C 800 ^{0} C to 1200 ^{0} C	0.5 ^{0} C 1.2 ^{0} C 2.2 ^{0} C	Using R Type Thermocouple, DTI by Comparison Method

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II.	**SPECIFIC HEAT AND HUMIDITY**			
1.	Temperature & Humidity Indicators[$]	30 % to 95 % Rh @ 25 ^{0} C 5 ^{0} C to 50 ^{0} C @ 60 % RH	1.8 % 0.3 ^{0} C	Using Temperature & Humidity Indicator with Probe PT 100 with Digital Indicator by Comparison Method
2.	Humidity Chambers[♣]	30 % to 95 % Rh @ 25 ^{0} C	1.8 % RH	Using Temperature & Humidity Indicator with Probe by Comparison Method & Single Position

*** Measurement Capability is expressed as an uncertainty (±) at a confidence probability of 95%**
[$]Only in Permanent Laboratory
[Φ] 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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Program Director