LABORATORY LOCATION:
(PERMANENT LABORATORY)

OBSNAP CALIBRATION SDN. BHD.
29A, JALAN SS15/4C
47500 SUBANG JAYA,
SELANGOR, MALAYSIA

FIELDS OF CALIBRATION: **DIMENSIONAL, FORCE & MASS, HEAT & TEMPERATURE, PRESSURE, TIME & FREQUENCY**

This laboratory has demonstrated its technical competence to operate in accordance with MS ISO/IEC 17025:2017 (ISO/IEC 17025:2017).

This laboratory's fulfillment of the requirements of ISO/IEC 17025 means the laboratory meets both the technical competence requirements and management system requirements that are necessary for it to consistently deliver technically valid test results and calibrations. The management system requirements in ISO/IEC 17025 are written in language relevant to laboratory operations and operate generally in accordance with the principles of ISO 9001 (see Joint ISO-ILAC-IAF Communiqué dated April 2017).

*** The expanded uncertainties are based on an estimated confidence probability of approximately 95% and have a coverage factor of *k*=2 unless stated otherwise.**

SCOPE OF CALIBRATION: DIMENSIONAL

Instrument Calibrated/ Measurement Parameter	Range	Calibration and Measurement Capability Expressed as an Uncertainty (±) *	Remarks
Thickness Gauge (Dial/ Digimatic)	0 mm to 25 mm	0.002 mm	Calibrated by using gauge block reference to in house method
Coating Thickness Gauge	0 µm to 3000 µm	3.3 µm	Calibrated by using thickness foil
Non-Metallic Thickness Foil	0 µm to 3000 µm	0.37 µm	Calibrated by using MU checker with reference to BS EN ISO 2178:2016
Caliper	0 µm to 150 **m**m	0.01 mm	Calibrated by using gauge block with reference to BS EN ISO 13385-1:2019
Ultrasonic Thickness Gauge	0 mm to 100 mm	0.01mm	Calibrated by using gauge block based on in house method

Signatories:

1. **Cheng Kam Seng**
2. **Norhaslinda Ahmad**

SCOPE OF CALIBRATION: DIMENSIONAL

Instrument Calibrated/ Measurement Parameter	Range	Calibration and Measurement Capability Expressed as an Uncertainty (±) *	Remarks
Micrometer	0 mm to 25 mm 25 mm to 100 mm 100 mm to 175 mm 175 mm to 275 mm	0.0018 mm 0.0022 mm 0.0028 mm 0.0040 mm	Calibrated by using gauge block with reference to standard BS EN ISO 3611: 2010

Signatories:

1. **Cheng Kam Seng**
2. **Norhaslinda Ahmad**

SCOPE OF CALIBRATION: FORCE

SITE: CATEGORY I

Instrument Calibrated/ Measurement Parameter	Range	Calibration and Measurement Capability Expressed as an Uncertainty (±) *	Remarks
Universal Testing Machine Compression Mode	0 kN to 0.5 kN 0.5 kN to 10 kN 10 kN to 100 kN 100 kN to 300 kN	4.4 N 32 N 0.52 kN 2.0 kN	Calibrated by using load cell with reference to ISO 7500-1:2018
Tension Mode	0 to 10 kN	32 N	

Signatory:

1. **Cheng Kam Seng**

SCOPE OF CALIBRATION: HEAT AND TEMPERATURE

Instrument Calibrated/ Measurement Parameter	Range	Calibration and Measurement Capability Expressed as an Uncertainty(±)*	Remarks
Temperature Controlled Enclosures	-80 °C to 250 °C 250 °C to 1200 °C	1.0 °C 3.8 °C	Calibrate by using temperature recorder with sensor reference to BS EN IEC 60068.3-6:2018 & EURAMET cg 20 Version 5.0 (09/2017)
Temperature Measuring Device (By electrical simulation)			By electrical simulation using calibrator and reference table ITS 90 Reference to EURAMET_cg-11_v.02 Temperature Indicator and stimulation.
a) Type R	0 °C to 1700 °C	1.3 °C	
b) Type K	-100 °C to 1300 °C	0.42 °C	
c) Type E	-100 °C to 850 °C	0.42 °C	
d) Type J	-100 °C to 1050 °C	0.33 °C	
e) Type T	-100 °C to 390 °C	0.52 °C	
f) Type S	0 °C to 1700 °C	1.3 °C	
g) Type N	-200 °C to 1200 °C	0.42 °C	
h) Type B	600 °C to 1800 °C	0.52 °C	
i) PT (RTD)	-200 °C to 650 °C	0.25 °C	

SCOPE OF CALIBRATION: HEAT AND TEMPERATURE

Instrument Calibrated/ Measurement Parameter	Range	Calibration and Measurement Capability Expressed as an Uncertainty (±) *	Remarks
Temperature Calibrator			
I) Sorce			
a) Type R	0 °C to 500 °C 500 °C to 1700 °C	1.3 °C	
b) Type K	-100 °C to 1300 °C	0.27 °C	
c) Type E	-100 °C to 850 °C	0.20 °C	
d) Type J	-100 °C to 1050 °C	0.21 °C	
e) Type T	-100 °C to 390 °C	0.29 °C	
f) Type S	0 °C to 500 °C 500 °C to 1700 °C	1.6 °C 0.77 °C	
g) Type N	-200 °C to -100 °C -200 °C to 1200 °C	0.77 °C 0.38 °C	By electrical simulation using calibrator multimeter and reference table ITS 90 Reference to EURAMET_cg-11_v. 2.0 Temperature_Indicator and stimulation.
h) Type B	600 °C to 1800 °C	1.3 °C	
i) PT(RTD)	-200 °C to 650 °C	0.14 °C	
II) Measurement			
a) Type R	0 °C to 1700 °C	1.3 °C	
b) Type K	-100 °C to 1300 °C	0.42 °C	
c) Type E	-100 °C to 850 °C	0.42 °C	
d) Type J	-100 °C to 1050 °C	0.33 °C	
e) Type T	-100 °C to 390 °C	0.52 °C	
f) Type S	0 °C to 1700 °C	1.3 °C	
g) Type N	-200 °C to 1200 °C	0.42 °C	
h) Type B	600 °C to 1800 °C	0.52 °C	
i) PT(RTD)	-200 °C to 650 °C	0.25 °C	

SCOPE OF CALIBRATION: HEAT AND TEMPERATURE

Instrument Calibrated/ Measurement Parameter	Range	Calibration and Measurement Capability Expressed as an Uncertainty (±) *	Remarks
Liquid-In-Glass Thermometer (Total Immersion)	-80 °C to 50 °C 50 °C to 350 °C 350 °C to 400 °C	0.31 °C 0.44 °C 0.52 °C	Comparison with PRT Sensor and thermocouple in liquid bath / dry block reference to ASTM E77-14
Liquid-In-Glass Thermometer (Partial Immersion)	-80 °C to 50 °C 50 °C to 350 °C 350 °C to 400 °C	0.31 °C 0.44 °C 0.52 °C	
Temperature Sensor with Indicator	-80 °C to 50 °C 50 °C to 350 °C 350 °C to 650 °C	0.31 °C 0.44 °C 0.52 °C	Comparison with PRT sensor and thermocouple in liquid bath / dry block / chamber reference to JIS C1602-1995, JIS C1603-1983, JIS C1604-1997.
Thermohygro Measuring Device i) Temperature	-40 °C to -20 °C -20 °C to 50 °C	0.63 °C 0.45 °C	Comparison with PRT sensor in Chamber
ii) Humidity @ 25 °C	30 %RH to 60 %RH 60 %RH to 90 %RH	2.8 %RH 3.3 %RH	Comparison with thermohygrometer reference to 1339-3:2004, ISO 4677/1, & ISO 4677/2.
	25 %RH to 30 %RH 90 %RH to 95 %RH	3.3 %RH 5.1 %RH	Comparison with wet & dry method in chamber Reference to 1339-3:2004, ISO 4677/1, & ISO 4677/2.

SCOPE OF CALIBRATION: HEAT AND TEMPERATURE

Instrument Calibrated/ Measurement Parameter	Range	Calibration and Measurement Capability Expressed as an Uncertainty (±) *	Remarks
DC Voltage (Temperature Transmitter)	0 to 10 V	0.002 V	By electrical simulation using calibrator and reference table ITS 90 Reference to EURAMET_cg-11_v.2.0 Temperature _Indicator and stimulation
DC Current (Temperature Transducer)	0 mA to 20 mA	0.005 mA	
Temperature Block Calibrator (portable)	30 °C to 400 °C 400 °C to 640 °C	0.3 °C 0.3 °C	Comparison with PRT Sensor / Thermocouple reference to EUROMET / cg – 13/ Version 4.0:2017
Liquid Bath (Portable)	-80 °C to 50 °C 50 °C to 90 °C	0.3 °C 0.3 °C	

Signatory:

1. **Cheng Kam Seng**

SCOPE OF CALIBRATION: HEAT AND TEMPERATURE

SITE: CATEGORY I

Instrument Calibrated/ Measurement Parameter	Range	Calibration and Measurement Capability Expressed as an Uncertainty (±) *	Remarks
Temperature Controlled Enclosures	-80 °C to 250 °C 250 °C to 1200 °C	1.0 °C 3.8 °C	Calibrate by using temperature recorder with sensor reference to BS IEC 60068.3-6:2018 & EURAMET cg 20 Version 5.0 (09/2017)
Temperature Measuring Device (By electrical simulation) a) Type R b) Type K c) Type E d) Type J e) Type T f) Type S g) Type N h) Type B i) PT(RTD)	 0 °C to 1700 °C -100 °C to 1300 °C -100 °C to 850 °C -100 °C to 1050 °C -100 °C to 390 °C 0 °C to 1700 °C -200 °C to 1200 °C 600 °C to 1800 °C -199.9 °C to 650 °C	 1.3 °C 0.42 °C 0.42 °C 0.33 °C 0.52 °C 1.3 °C 0.42 °C 0.52 °C 0.25 °C	By electrical simulation using calibrator and reference table ITS 90 reference to EURAMET_cg-11_v.2.0 Temperature Indicator and stimulation.
Liquid-In-Glass Thermometer (Partial Immersion)	0 °C 30 °C to 200 °C 200 °C to 400 °C	0.62 °C 0.64 °C 2.0 °C	Comparison with PRT sensor and thermocouple in liquid bath / dry block reference to ASTM E77-14
Temperature Sensor with indicator	0 °C 30 °C to 200 °C 199.9 °C to 400 °C	0.62 °C 0.9 °C 2.0 °C	Comparison with PRT Sensor and thermocouple in liquid bath / dry block / chamber reference to JIS C1602-1995, JIS C1603-1983, JIS C1604-1997.
DC Voltage (Temperature Transmitter)	0 to 10 V	0.002 V	By electrical simulation using calibrator and reference table ITS 90 Reference to EURAMET_cg-11_v. 2.0Temperature Indicator and stimulation.

SCOPE OF CALIBRATION: HEAT AND TEMPERATURE

SITE: CATEGORY I

Instrument Calibrated/ Measurement Parameter	Range	Calibration and Measurement Capability Expressed as an Uncertainty (±) *	Remarks
DC Current (Temperature transducer)	0 mA to 20 mA	0.005 mA	By electrical simulation using calibrator and reference table ITS 90 reference to EURAMET_cg-11_v.01 Temperature Indicator and stimulation.
Temperature Block Calibrator	30 °C to 400 °C 400 °C to 640 °C	0.3 °C 0.3 °C	Comparison with PRT Sensor / Thermocouple reference to EUROMET/cg-13/ Version 4.0:2017
Liquid Bath	-80 °C to 50 °C	0.2 °C	
Humidity Chamber @25°C	25 %RH to 90 %RH	3.7 %RH	Calibrate by using humidity measuring device referring to BS EN IEC 60068-3-6:2018 & EURAMET cg 20. Version 5.0 (09/2017)
	10 %RH to 25 %RH	1.8 %RH	Calibrate by using wet & dry method referring to BS EN IEC 60068-3-6:2018 & EURAMET cg 20. Version 5.0 (09/2017)
	90 %RH to 95 %RH	5.5 %RH	

Signatory:

1. **Cheng Kam Seng**

SCOPE OF CALIBRATION: PRESSURE

Instrument Calibrated/ Measurement Parameter	Range	Calibration and Measurement Capability Expressed as an Uncertainty(±)*	Remarks
Pressure Measuring Device Vacuum Pneumatic Hydraulic	 -0.95 bar to 1 bar 1 bar to 2 bar 2 bar to 20 bar 0 bar to 100 bar 100 bar to 300 bar 300 bar to 700 bar	 0.0014 bar 0.008 bar 0.016 bar 0.66 bar 0.71 bar 0.77 bar	Calibrate by using pressure calibrator or pressure meter reference to AS 1349(1986), DKD-R 6-1

Signatory:

1. **Cheng Kam Seng**

SCOPE OF CALIBRATION: PRESSURE

SITE: CATEGORY I

Instrument Calibrated/ Measurement Parameter	Range	Calibration and Measurement Capability Expressed as an Uncertainty (±) *	Remarks
Pressure Measuring Device Vacuum Pneumatic Hydraulic	 -0.95 bar to 1 bar 1 bar to 2 bar 2 bar to 20 bar 0 bar to 100 bar 100 bar to 300 bar 300 bar to 700 bar	 0.002 bar 0.008 bar 0.02 bar 0.7 bar 0.8 bar 0.8 bar	Calibrate by using pressure calibrator or pressure meter with reference to AS1349 (1986) DICD-R 6-1

Signatory:

1. **Cheng Kam Seng**

SCOPE OF CALIBRATION: MASS

Instrument Calibrated/ Measurement Parameter	Range	Calibration and Measurement Capability Expressed as an Uncertainty (±) *	Remarks
Standard Weight	500 mg 1g 2g 5g 10g 20g 50g 100g 200g 500g 1000g 2000g 5000g	0.41 mg 0.41 mg 0.41 mg 0.42 mg 0.45 mg 0.54 mg 0.97 mg 1.8 mg 3.6 mg 0.024 g 0.028 g 0.042 g 0.091 g	Calibrated by using standard weight and mass comperator with reference to OIML R111-1:2004 (E) and LAB 14 Edition 6, October 2019

Signatory:

1. **Cheng Kam Seng**

SCOPE OF CALIBRATION: MASS

SITE: CATEGORY I

Instrument Calibrated/ Measurement Parameter	Range	Calibration and Measurement Capability Expressed as an Uncertainty (±) *	Remarks
Balance and Weighing Scale	Up to 20 g 20 g to 200 g 200 g to 1000 g 1000 g to 5000 g 5 kg to 10 kg 10 kg to 50 kg 10 kg to 100 kg 100 kg to 300 kg	0.10 mg 0.31 mg 0.002 g 0.02 g 0.2 g 1 g 5 g 0.01 g	Calibrate by using standard weight Based on ASTM E898-20 & LAB 14 Edition 5, July 2015
Standard Weight	5000 g	1.4 g	Calibrated by using standard weight and mass comperator with reference to OIML R111-1:2004 (E) and LAB 14 Edition 6, October 2019

Signatory:

1. **Cheng Kam Seng**

SCOPE OF CALIBRATION: TIME AND FREQUENCY

Instrument Calibrated/ Measurement Parameter	Range	Calibration and Measurement Capability Expressed as an Uncertainty (±) *	Remarks
Tachometer Non-Contact	0 rpm to 1000 rpm 1000 rpm to 20000 rpm	1.5 rpm 1.7 rpm	Calibrate by stroboscope and tachometer reference to ASTM F2046 (Reapproved 2017)
Stopwatch / Timer	0 s to 60 s 60 s to300 s 300 s to 600 s 600 s to 900 s 900 s to 1800 s 1800 s to 3600 s 3600 s to 10800 s	0.087 s 0.11 s 0.11 s 0.12 s 0.13 s 0.13 s 0.14 s	Calibrate using stopwatch by direct comparison

Signatory:

1. **Cheng Kam Seng**

SCOPE OF CALIBRATION: TIME AND FREQUENCY

SITE: CATEGORY I

Instrument Calibrated/ Measurement Parameter	Range	Calibration and Measurement Capability Expressed as an Uncertainty (±) *	Remarks
RPM Instrument	0 rpm to 1000 rpm 1000 rpm to 20000 rpm	1.7 rpm 2.3 rpm	Calibrate using tachometer with reference to ASTM F2046
Stopwatch / Timer	0 s to 60 s 60 s to300 s 300 s to 600 s 600 s to 900 s 900 s to 1800 s 1800 s to 3600 s 3600 s to 10800 s	0.087 s 0.11 s 0.11 s 0.12 s 0.13 s 0.13 s 0.14 s	Calibrate using stopwatch by direct comparison

Signatory:

1. **Cheng Kam Seng**