

NO: SAMM 182(Issue 3, 17 June 2022 replacement
of SAMM 182 dated 9 April 2020)

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LABORATORY LOCATION:
(PERMANENT LABORATORY)**SETIANAS SDN BHD**
NO.17, JALAN HARMONIUM 35/3
TAMAN DESA TEBRAU
81100 JOHOR BAHRU, JOHOR
MALAYSIA**FIELD(S) OF CALIBRATION:****FORCE & TORQUE, PRESSURE, DIMENSIONAL,**
MASS, TEMPERATURE

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: FORCE & TORQUE

Instrument Calibrated/ Measurement Parameter	Range	Calibration and Measurement Capability Expressed as an Uncertainty(\pm)*	Remarks
Tension Gauge	0.6 gf to 20 gf 20 gf to 100 gf 50 gf to 1000 gf	0.05 gf 1.2 gf 5 gf	Calibrated using poise weights as standards according to ISO 376 : 2011
Push-Pull Gauge	0 kgf to 0.5 kgf 0.5 kgf to 2 kgf 2 kgf to 20 kgf 20 kgf to 100 kgf	0.00006 kgf 0.006 kgf 0.008 kgf 0.012 kgf	Calibrated using poise weights as standards according to ISO 376 : 2011
Torque Tools (Wrenches and Drivers)	1 kgf.cm to 10 kgf.cm 10 kgf.cm to 100 kgf.cm 100 kgf.cm to 900 kgf.cm 900 kgf.cm to 2900 kgf.cm 2900 kgf.cm to 7000 kgf.cm	0.004 kgf.cm 0.17 kgf.cm 1.0 kgf.cm 10 kgf.cm 22 kgf.cm	Calibrated using Torque Meter as standards according to ISO 6789: 2017
Torque Measuring Device	0 kgf.cm to 2 kgf.cm 2 kgf.cm to 50 kgf.cm 50 kgf.cm to 300 kgf.cm 300 kgf.cm to 3000 kgf.cm 3000 kgf.cm to 6000 kgf.cm	0.0002 kgf.cm 0.004 kgf.cm 0.03 kgf.cm 0.7 kgf.cm 1.6 kgf.cm	Calibrated using poise weights as standards according to BS 7882: 2017

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Instrument Calibrated/ Measurement Parameter	Range	Calibration and Measurement Capability Expressed as an Uncertainty(\pm)*	Remarks
Tension Tester	0 kgf to 1000 kgf	2.3kgf	Calibrated using Load Cell as standards according to ISO 7500-1:2018
	1000 kgf to 10000 kgf	24 kgf	
Compression Tester	0 kgf to 1000 kgf	2.3 kgf	
	1000 kgf to 10000 kgf	24 kgf	
	10000 kgf to 40000 kgf	70 kgf	
	40000 kgf to 200000 kgf	310 kgf	

Signatories:

1. **Bryan Yek Kim Yoong**
2. **Seah Leong Ho***

*Non-resident signatory

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SCOPE OF CALIBRATION: PRESSURE

Instrument Calibrated/ Measurement Parameter	Range	Calibration and Measurement Capability Expressed as an Uncertainty(\pm)*	Remarks
Vacuum	-0.9 bar to 0 bar	0.004 bar	Calibrated using Pressure Calibrator as standards according to AS 1349 : 1986
Pneumatic	0 bar to 2 bar 2 bar to 20 bar	0.002 bar 0.01 bar	Calibrated using Pressure Calibrator as standards according to AS 1349 : 1986
Hydraulic	0 psi to 5000 psi 5000 psi to 16000 psi	0.062 % of reading 0.063 % of reading	Calibrated using Dead weights as standards according to AS 1349 : 1986

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SCOPE OF CALIBRATION: PRESSURE**SITE: CATEGORY I**

Instrument Calibrated/ Measurement Parameter	Range	Calibration and Measurement Capability Expressed as an Uncertainty(\pm)*	Remarks
Vacuum	-0.9 bar to 0 bar	0.004 bar	Calibrated using Pressure Calibrator as standards according to AS 1349:1986
Pneumatic	0 bar to 2 bar	0.002 bar	
	2 bar to 20 bar	0.02 bar	
Hydraulic	0 psi to 10000 psi	0.3% of reading	
	10000 psi to 20000 psi	0.2% of reading	

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SCOPE OF CALIBRATION: DIMENSIONAL

Instrument Calibrated/ Measurement Parameter	Range	Calibration and Measurement Capability Expressed as an Uncertainty(\pm)*	Remarks
Dial Gauge / Indicator	0 mm to 5 mm 5 mm to 20 mm	1.0 μ m 3.0 μ m	Calibrated using Dial Gauge Tester as standards with reference to ISO463:2006
Digital / Digimatic Indicator	0 mm to 25 mm 25 mm to 50 mm	0.6 μ m 0.8 μ m	Calibrated using Gauge Blocks as standards with reference to JIS B 7536 : 1982
External Micrometer	25mm travel for frame sizes: 0 mm to 25 mm 50 mm 75 mm 100 mm 125 mm 150 mm 175 mm and 200 mm 225 mm 250mm, 275 mm and 300 mm	1.1 μ m 1.2 μ m 1.3 μ m 1.5 μ m 1.7 μ m 1.9 μ m 2.4 μ m 2.4 μ m 4.0 μ m	Calibrated using Gauge Blocks as standards with reference to ISO 3611 2010
Caliper	0 mm to 150 mm 0 mm to 200 mm 0 mm to 300 mm 0 mm to 450 mm 0 mm to 600 mm	9 μ m 9 μ m 11 μ m 12 μ m 13 μ m	Calibrated using Gauge Blocks as standards with reference to ISO 13385: 2011
Dial Test Indicator	0 mm to 0.14 mm 0.14 mm to 1 mm 1 mm to 2 mm	0.9 μ m 1.2 μ m 3.0 μ m	Calibrated using Dial Gauge Tester as standards with reference to ISO 9493:2010

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Instrument Calibrated/ Measurement Parameter	Range	Calibration and Measurement Capability Expressed as an Uncertainty(\pm)*	Remarks
Height Gauge	0 mm to 300 mm 300 mm to 450 mm 450 mm to 600 mm	4.4 μ m 5.6 μ m 6.9 μ m	Calibrated using Gauge Blocks as standards with reference to ISO 13225: 2012
Dial/ Digital Thickness Gauge	0 mm to 10 mm 10 mm to 20 mm	1.0 μ m 3.0 μ m	Calibrated using Gauge Blocks as standards with reference to ISO 463:2006
Feeler Gauge	0 mm to 3 mm	1.2 μ m	Calibrated using Linear Gauge as standards with reference to JIS B 7524: 2008
Height Setting Micrometer	0 mm to 300 mm 300 mm to 600 mm	2.5 μ m 4.6 μ m	Calibrated using Gauge Blocks as standards with reference to ISO 7863: 1984
Caliper Checker	0 mm to 300 mm 300 mm to 600 mm	2.5 μ m 4.6 μ m	Calibrated using Gauge Blocks as standards with reference to ISO 7863: 1984
Pin Gauge	0 mm to 25 mm	1.3 μ m	Calibrated using UMM as standards with reference to JIS B 7420: 1997

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SCOPE OF CALIBRATION: DIMENSIONAL

Instrument Calibrated/ Measurement Parameter	Range	Calibration and Measurement Capability Expressed as an Uncertainty(\pm)*	Remarks
Plain Plug Gauge	0 mm to 25 mm 25 mm to 50 mm 50 mm to 100 mm	0.9 μ m 1.0 μ m 1.6 μ m	Calibrated using Universal Length Measuring Machine as standards with reference to JIS B 7420: 1997
Ring Gauge	4 mm to 30 mm 30 mm to 100 mm	1.0 μ m 1.8 μ m	Calibrated using Universal Length Measuring Machine as standards with reference to JIS B 7420: 1997
Ruler	0 mm to 1000 mm	0.20 mm	Calibrated using Standard Ruler as standards with reference to JIS B 7516: 1987
Thread Plug Gauge (Major and pitch diameter only)	1 mm to 30 mm 30 mm to 68 mm	1.5 μ m 1.7 μ m	Calibrated using Universal Length Measuring Machine as standards with reference to JIS B 0261: 2004
Thread Ring Gauge (Minor and pitch diameter only)	4 mm to 30 mm 30 mm to 68 mm	1.5 μ m 2.0 μ m	Calibrated using Universal Length Measuring Machine as standards with reference to JIS B 0261: 2004

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SCOPE OF CALIBRATION: DIMENSIONAL**SITE CALIBRATION: CATEGORY I**

Instrument Calibrated/ Measurement Parameter	Range	Calibration and Measurement Capability Expressed as an Uncertainty(\pm)*	Remarks
Profile Projector (Linear Axis)	0 mm to 200 mm	0.0025 mm	Calibrated using Glass Scale as standards with reference to JIS B 7184 : 1999
Surface Plate	2000 mm x 2000 mm	1.3 μ m	Calibrated using Level Meter as standards with reference to JIS B 7513 : 1992

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Instrument Calibrated/ Measurement Parameter	Range	Calibration and Measurement Capability Expressed as an Uncertainty(\pm)*	Remarks
Standard Weight	1 mg , 2 mg , 5 mg , 10 mg , 20 mg	0.02 mg	Calibrated using Standard Weights and Comparator as standards according to OIML R111-2 : 2004
	50 mg , 100 mg , 200 mg , 500 mg	0.02 mg	
	1 g , 2 g , 5 g	0.03 mg	
	10 g , 20 g ,	0.04 mg	
	50 g	0.06 mg	
	100g	0.11 mg	
	200 g	0.19 mg	
	500 g	1.3 mg	
	1 kg	1.7 mg	
	2 kg	4.6 mg	
	5 kg	13 mg	
	10 kg	117 mg	
20 kg	125 mg		

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SCOPE OF CALIBRATION: MASS**SITE: CATEGORY I**

Instrument Calibrated/ Measurement Parameter	Range	Calibration and Measurement Capability Expressed as an Uncertainty(\pm)*	Remarks
Analytical Balance	1 mg to 50 g 100 to 200 g	0.0002 g 0.0004 g	Calibrated using Standard weights as standards according to ASTM E898 : 2020
Weighing Balance	200 g to 600 g 600 g to 1000 g 1000 g to 2000 g 2000 g to 5000 g 5000 g to 10000 g 6000 g to 20000 g 20 kg to 60 kg 60 kg to 100 kg 100 kg to 200 kg 200 kg to 500 kg 500 kg to 1000 kg 1000 kg to 2000 kg	0.0050 g 0.054 g 0.011 g 0.22 g 0.053g 0.11 g 0.0023 kg 0.003 kg 0.064 kg 0.015 kg 0.03 kg 0.063 kg	Calibrated using Standard weights as standards according to ASTM E898 : 2020 Euramet Cg-18 Ver 4.0

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SCOPE OF CALIBRATION: TEMPERATURE

Instrument Calibrated/ Measurement Parameter	Range	Calibration and Measurement Capability Expressed as an Uncertainty(\pm)*	Remarks
Temperature Indicator (Electrical Simulation) (K-Type)	-100 °C to 1300 °C	0.2 °C	Calibrated using temperature Calibrator as standards according to JIS C 1601 : 1983 and JIS C 1603 : 1983
(E-Type)	-100 °C to 950 °C	0.2 °C	
(J-Type)	-100 °C to 1000 °C	0.2 °C	
(T-Type)	-100 °C to 400 °C	0.2 °C	
(N-Type)	-100 °C to 1300 °C	0.3 °C	
(R-Type)	0 °C to 1600 °C	0.5 °C	
(S-Type)	0 °C to 1600 °C	0.5 °C	
(PRT)	-100 °C to 800 °C	0.12 °C	
Temperature Sensor a: PRT	-40 °C to 200 °C	0.1 °C	Calibrated using PRT as standards according to JIS C 1604 : 1997
	200 °C to 400 °C	1 °C	
	400 °C to 600 °C	2 °C	
b: Thermocouple	-40 °C to 200 °C	0.1 °C	
	200 °C to 400 °C	1 °C	
	400 °C to 600 °C	2 °C	Calibrated using PRT and Thermocouple as standards according to JIS C 1602 : 1995
	600 °C to 1100 °C	3 °C	
	1100 °C to 1200 °C	4 °C	

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SCOPE OF CALIBRATION: TEMPERATURE

Instrument Calibrated/ Measurement Parameter	Range	Calibration and Measurement Capability Expressed as an Uncertainty(\pm)*	Remarks
Mechanical Thermometer	-20 °C to 200 °C 200 °C to 400 °C 400 °C to 650 °C	0.7 °C 2 °C 3 °C	Calibrated using PRT as standards according to JIS C 1602 : 1995
Liquid-in-glass Thermometer (total & Partial immersion)	-20 °C to 50 °C 50 °C to 200 °C	0.1 °C 0.1 °C	Calibrated using PRT as standards according to ASTM E77 : 2007
Thermohygrograph / Thermohygrometer	30 %RH to 90 %RH @ 23 °C 20 °C to 80 °C	4 %RH 0.4 °C	Calibrated using Precision Thermohygrometer and PRT as Standards according to BS 1339-3 : 2004

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SCOPE OF CALIBRATION: TEMPERATURE**SITE CALIBRATION: CATEGORY I**

Instrument Calibrated/ Measurement Parameter	Range	Calibration and Measurement Capability Expressed as an Uncertainty(\pm)*	Remarks
Temperature Controlled Enclosures	-20 °C to 200 °C 200 °C to 400 °C 400 °C to 1100 °C	0.7 °C 1.2 °C 3.5 °C	Calibrated using PRT or Thermocouple as standards according to AS2853 : 1986
Temperature Indicator (Electrical Simulation) (K-Type)	-100 °C to 1300 °C	0.2 °C	Calibrated using Temperature Calibrator as standards according to JIS C 1601 : 1983 and JIS C 1603 : 1983
(E-Type)	-100 °C to 950 °C	0.2 °C	
(J-Type)	-100 °C to 1000 °C	0.2 °C	
(T-Type)	-100 °C to 400 °C	0.2 °C	
(N-Type)	-100 °C to 1300 °C	0.3 °C	
(R-Type)	0 °C to 1600 °C	0.5 °C	
(S-Type)	0 °C to 1600 °C	0.5 °C	
(PRT)	-100 °C to 800 °C	0.12 °C	

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