

NO: SAMM 681

(Issue 4, 17 March 2016 replacement of SAMM 681 dated 5 January 2016)

LABORATORY LOCATION:
(PERMANENT LABORATORY)

MICRON METROLOGY
68-1-15, BLOCK H, CHERAS BUSINESS CENTRE
JALAN 5/101C
56100 KUALA LUMPUR
MALAYSIA

This laboratory accredited under *Skim Akreditasi Makmal Malaysia (SAMM)* meets the requirements of MS ISO/IEC 17025:2005 'General requirements for competence of testing and calibration laboratories'. This Malaysian Standards is identical with ISO/IEC 17025:2005 published by the International Organization for Standardization (ISO).

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

FIELD OF CALIBRATION: DIMENSIONAL

SCOPE OF ACCREDITATION:

Instrument Calibrated/ Measurement Parameter	Range	Calibration and Measurement Capability Expressed as an Uncertainty (\pm)*	Remarks
Long gauge block / Length bar / Setting Rod	25 mm to 1000 mm	(0.4 L) μm L is in unit meter	Calibration by laser measurement system with reference to JIS B 7506
Caliper checker	0 mm to 600 mm	(1.0 L) μm L is in unit meter	Calibration by laser measurement system
Check master	0 mm to 1000 mm	(1.0 L) μm L is in unit meter	Calibration by laser measurement system
Inside micro checker	0 mm to 600 mm	(1.0 L) μm L is in unit meter	Calibration by laser measurement system
Glass scale / Standard scale	0 mm to 600 mm	(0.8 + 0.2 L) μm L is in unit meter	Calibration by laser measurement system with reference to JIS B 7541
Digital scale read out / Linear scale	0 mm to 1000 mm	(0.1 + 0.2 L) μm L is in unit meter	Calibration by laser measurement system with reference to JIS B 7450
Straightedge / Planekator (Straightness only)	100 mm to 1000 mm	0.5 μm	Calibration by laser measurement system with reference to JIS B 7514



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FIELD OF CALIBRATION: DIMENSIONAL**SCOPE OF ACCREDITATION:**

Instrument Calibrated/ Measurement Parameter	Range	Calibration and Measurement Capability Expressed as an Uncertainty (\pm)*	Remarks
Autocollimator	± 1 degree	0.0001 degree	Calibration by laser measurement system with reference to JIS B 7538
Inclinometer / Digital angular level	± 3 degree	0.0009 degree	Calibration by laser measurement system with reference to JIS B 7510
Precision level	± 1 degree	0.004 degree	Calibration by laser measurement system with reference to JIS B 7510
Micrometer (external measurement)	25 mm Travel range Frame size: Up to 50 mm 50 mm to 100 mm 100 mm to 200 mm 200 mm to 300 mm 300 mm to 450 mm 450 to 600 mm	0.001 mm 0.001 mm 0.0012 mm 0.0016 mm 0.0020 mm 0.0025 mm 0.003 mm	Calibration by gauge block with reference to BS EN ISO 3611 Note: Standard rod to be provided if the measurement range is > 25 mm
Caliper (external and internal measurement)	Up to 300 mm	0.008 mm	Calibration by caliper checker with reference to JIS B 7507
Dial test indicator	Up to 3 mm	$(0.38 + 0.068 L) \mu\text{m}$ <i>L</i> is measurement length in unit meter	Calibration by laser measurement system with reference to JIS B 7533
Dial gauge	Up to 100 mm	$(0.31 + 0.068 L) \mu\text{m}$ <i>L</i> is measurement length in unit meter	Calibration by laser measurement system with reference to JIS B 7503
Digital linear probe / Digital level probe / LVDT probe	Up to 200 mm	$(0.08 + 0.068 L) \mu\text{m}$ <i>L</i> is measurement length in unit meter	Calibration by laser measurement system with reference to JIS B 7536



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SCOPE OF ACCREDITATION:

Instrument Calibrated/ Measurement Parameter	Range	Calibration and Measurement Capability Expressed as an Uncertainty (\pm)*	Remarks
Rotary table / Angular indexing table / Rotational stage	0° to 360°	0.0006°	Calibration by laser autocollimator and precision polygon system
Precision polygon	0° to 360°	0.0006°	Calibration by laser autocollimator with reference to JIS B 7432
Squareness block / L-square / Tri-square	90°	0.004°	Calibration by precision rotary table with reference to JIS B 7526 or JIS B 7534
Angle gauge	Up to 90°	0.004°	Calibration by precision rotary table
Gauge block	0.5 mm to 100 mm	$(0.003 L + 0.25) \mu\text{m}$ <i>L</i> is length in mm	Calibration by comparison to gauge block with reference to JIS B 7506
Jig and part fixture (length, thickness, diameter, radius, angle, parallelism, straightness, plane flatness, circularity and cone) (Surface roughness)	Up to 360 degree 0.001 mm to 1350 mm (or inches equivalent) -0.200 mm to 0.150 mm	0.0025 degree $(0.023 L + 2.5) \mu\text{m}$ <i>L</i> is length in mm 0.0007 mm	Calibration coordinate measuring machine (CMM) with reference to NPL Good Practice No. 41, CMM Measurement Strategies Calibration by roughness measurement instrument
Angle level	-180 degree to 180 degree	0.0034 degree	Calibration by vertical precision rotary table and datum to gravity with reference to JIS B 7510
Feeler / Thickness gauge	Up to 3 mm (or inches equivalent)	2 μm	Calibration by precision linear probe with reference to JIS B 7524



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Instrument Calibrated/ Measurement Parameter	Range	Calibration and Measurement Capability Expressed as an Uncertainty (\pm)*	Remarks
Plain ring gauge (diameter)	14 mm to 100 mm (or inches equivalent)	$(0.018 L + 2.0) \mu\text{m}$ <i>L</i> is length in mm	Calibration by gauge block and Universal Measuring Machine with reference to JIS B 7420
Pin / plain plug gauge (diameter)	0.5 mm to 100 mm (or inches equivalent)	$(0.018 L + 2.0) \mu\text{m}$ <i>L</i> is length in mm	
Thread plug gauge (pitch diameter and major diameter)	3 mm to 100 mm (or inches equivalent)	$(0.017 L + 2.5) \mu\text{m}$ <i>L</i> is length in mm	Calibration by gauge block, thread wire pins and Universal Measuring Machine with reference to JIS B 0261
Ruler	Up to 2000 mm (or inches equivalent)	0.12 mm	Calibration by laser measurement system with reference to JIS B 7516
Height gauge	Up to 300 mm	0.006 mm	Calibration by precision length master and precision square with reference to BS EN ISO 13225

Signatory:

1. Dr. Lim Chin Keong



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FIELD OF CALIBRATION: DIMENSIONAL

SITE CALIBRATION: CATEGORY I

SCOPE OF ACCREDITATION:

Instrument Calibrated/ Measurement Parameter	Range	Calibration and Measurement Capability Expressed as an Uncertainty (\pm)*	Remarks
CNC machine tools (Inclusive of CNC Milling, Lathe, Wire EDM, Water Jet, Laser Cut, Router and other production machine tools)	0 m to 10 m	$\sqrt{(2.0 + 2.0 L^2)}$ μm L is in unit meter	Calibration by laser measurement system with reference to ISO 230
Linear positioning (Inclusive of length measuring instrument, linear scale, linear position stage and table)	0 m to 10 m	$(0.1 + 0.2 L)$ μm L is in unit meter	Calibration by laser measurement system with reference to JIS B 7450
CNC machine tools (rotary axis)	0° to 360°	0.003°	Calibration by laser autocollimator and precision polygon system with reference to ISO 230
Rotary table / Angular indexing table / Rotational stage	0° to 360°	0.003°	Calibration by laser autocollimator and precision polygon system
Surface plate (overall flatness)	Up to 10 m x 10 m	$(1.3 L)$ μm L is diagonal length in unit meter	Calibration by Micro-Vel ME900s2 system (inclinator) with reference to BS 817, ISO 8512 or JIS B 7513
Profile projector / Measuring microscope (Range on individual linear axis only)	Up to 600 mm 600 mm to 2000 mm	0.0025 mm $(0.19 + 0.5 L)$ L is measurement length in unit meter	Calibration by glass scale (axis length \leq 650 mm) and laser measurement system (axis length $>$ 600 mm) with reference to JIS B 7184 or JIS 7153



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SITE CALIBRATION: CATEGORY I

SCOPE OF ACCREDITATION:

Instrument Calibrated/ Measurement Parameter	Range	Calibration and Measurement Capability Expressed as an Uncertainty (\pm)*	Remarks
Video measurement machine / Non-contact coordinate measuring machine (CMM) (Range on individual linear and plane diagonal axes)	Up to 650 mm 650 mm to 1000 mm	0.002 mm ($0.19 + 0.5 L$) <i>L</i> is measurement length in unit meter	Calibration by glass scale (axis length \leq 650 mm) and laser measurement system (axis length $>$ 650 mm) with reference to ISO 10360-7

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FIELD OF CALIBRATION: FORCE

SITE CALIBRATION: CATEGORY III

SCOPE OF ACCREDITATION:

Instrument Calibrated/ Measurement Parameter	Range	Calibration and Measurement Capability Expressed as an Uncertainty (\pm)*	Remarks
Indirect verification of Brinell Hardness Testers	150 HBW 3000 350 HBW 3000 550 HBW 3000	13 HBW 3000 13 HBW 3000 14 HBW 3000	Calibration by hardness test block of with reference to JIS 7724 and ASTM E10
Indirect verification of Vickers Hardness Testers	200 HV 0.1 400 HV 0.1 200 HV 1 700 HV 1 400 HV 10 700 HV 10	9.3 HV 0.1 17 HV 0.1 3.5 HV 1 13 HV 1 3.2 HV 10 6.1 HV 10	Calibration by hardness test block of with reference to JIS 7725 and ASTM E384
Indirect verification of Rockwell Hardness Testers	HRB 35 HRB 65 HRB 85 HRC 25 HRC 40 HRC 60	HRB 0.83 HRB 0.87 HRB 0.7 HRC 0.72 HRC 0.51 HRC 0.7	Calibration by hardness test block of with reference to JIS 7726 and ASTM E18

Signatory:

1. **Dr. Lim Chin Keong**



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22 September 2014

To Whom It May Concern

Authorization of sales of products and services of Micron Metrology Sdn Bhd and Micron Engineering.

This is to inform that MSP Metrology Sdn Bhd is appointed as Authorized Agent for the service and product listed below for the areas cover in Johor State and Singapore. The appointment period is for duration of three years from the date of this letter.

A) Products:

1. Laser interferometer system
2. Ball-bar system
3. Micro-Vel ME900-flatness calibration system

B) Calibration Services

1. CNC machine calibration (linear and rotary axes) inclusive CNC milling, lathe, wirecut, EDM and others.
2. CNC machine calibration (ball bar) inclusive CNC milling, lathe, wirecut, EDM and others.
3. Length measuring system such as length meter, Mitrac scale, linear scale and others.
4. Surface flatness calibration
5. Straightness calibration
6. Tool pre-setter calibration
7. Machine spindle verification
8. Other dimensional tools calibration

On behalf of Micron Metrology Sdn Bhd

Janice Kew

Janice Kew
Quality Manager

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