



# CERTIFICATE OF ACCREDITATION

## ANSI-ASQ National Accreditation Board

500 Montgomery Street, Suite 625, Alexandria, VA 22314, 877-344-3044

This is to certify that

**SP Metrology System Thailand Co., LTD**  
**88/115 Moo3 T.Klongsam A. Klongluang**  
**Pathumthani, Thailand**

has been assessed by ANAB  
and meets the requirements of international standard

## ISO/IEC 17025:2005

while demonstrating technical competence in the fields of

## CALIBRATION AND TESTING

Refer to the accompanying Scope of Accreditation for information regarding the types of calibrations and/or tests to which this accreditation applies.

ACT-2050

Certificate Number

  
ANAB Approval

Certificate Valid: 05/16/2016-05/16/2018  
Version No. 001 Issued: 05/16/2016



This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communiqué dated January 2009).

**SCOPE OF ACCREDITATION TO ISO/IEC 17025:2005**

**SP METROLOGY SYSTEM (THAILAND) CO., LTD**

88/115 Moo3 T. Klongsam A. Klongluang, Pathumthani, Thailand

Sombut Srikampa Phone: +662-193-2220

[Spmetro.md@gmail.com](mailto:Spmetro.md@gmail.com)

[www.spmetrology.com](http://www.spmetrology.com)

**CALIBRATION and TESTING**

Valid to: May 16, 2018

Certificate Number: ACT-2050

**I. Dimensional Calibration**

Parameter / Equipment	Range	Calibration and Measurement Capability [Expressed as Uncertainty( $\pm$ )]	Reference Standard or Equipment	Methods
<sup>2</sup> External Micrometer V-Anvil, Screw Thread, Indicating,	Up to 100 mm (100 to 125) mm (125 to 150) mm (150 to 175) mm (175 to 200) mm (200 to 250) mm (250 to 300) mm (300 to 400) mm (400 to 500) mm (500 to 600) mm (600 to 1 000) mm	1.5 $\mu$ m 1.8 $\mu$ m 2.1 $\mu$ m 2.4 $\mu$ m 2.8 $\mu$ m 3.4 $\mu$ m 4.1 $\mu$ m 5.4 $\mu$ m 6.8 $\mu$ m 8.1 $\mu$ m 13.5 $\mu$ m	Gauge Block Set	SP-CPD-04-01
<sup>2</sup> Vernier Caliper Dial and Digital	Up to 200 mm (200 to 300) mm (300 to 400) mm (400 to 500) mm (500 to 600) mm (600 to 700) mm (700 to 800) mm (800 to 900) mm (900 to 1 000) mm (1 000 to 1 500) mm	0.006 mm 0.007 mm 0.008 mm 0.009 mm 0.010 mm 0.011 mm 0.012 mm 0.013 mm 0.015 mm 0.021 mm	Gauge Block Set	SP-CPD-04-02
<sup>2</sup> Can Seam Micrometer	Up to 13 mm	2.3 $\mu$ m	Gauge Block Set	SP-CPD-04-03

Parameter / Equipment	Range	Calibration and Measurement Capability [Expressed as Uncertainty(±)]	Reference Standard or Equipment	Methods
<sup>2</sup> Internal Micrometer All type  Snap Micrometer (Up to 100 mm)	Up to 30 mm (30 to 45) mm (45 to 50) mm (50 to 60) mm (60 to 70) mm (70 to 80) mm (80 to 87) mm (87 to 97) mm (97 to 100) mm (100 to 125) mm (125 to 150) mm (150 to 175) mm (175 to 200) mm (200 to 250) mm (250 to 300) mm (300 to 400) mm (400 to 500) mm (500 to 600) mm	0.7 µm 0.8 µm 0.9 µm 1.0 µm 1.1 µm 1.2 µm 1.3 µm 1.4 µm 1.5 µm 1.8 µm 2.1 µm 2.4 µm 2.8 µm 3.4 µm 4.1 µm 5.4 µm 6.8 µm 8.1 µm	Gauge Block Set	SP-CPD-04-04
<sup>2</sup> Caliper Gauge External	Up to 25 mm (25 to 50) mm	1.2 µm 1.3 µm	Gauge Block	SP-CPD-04-05
<sup>2</sup> Caliper Gauge Internal (0.005mm)  Internal (0.01mm)	2.5 to 15 mm  (10 to 180) mm	3 µm  6 µm	Gauge Block	SP-CPD-04-06
<sup>2</sup> Thickness Gauge	Up to 20 mm (20 to 25) mm	0.6 µm 0.7 µm	Gauge Block	SP-CPD-04-07
<sup>2</sup> Height Gauge Dial and Digital	Up to 20 mm (20 to 50) mm (50 to 100) mm (100 to 150) mm (150 to 200) mm (200 to 250) mm (250 to 300) mm (300 to 400) mm (400 to 500) mm (500 to 600) mm	0.6 µm 0.9 µm 1.5 µm 2.1 µm 2.8 µm 3.4 µm 4.1 µm 5.4 µm 6.8 µm 8.1 µm	Gauge Block Set	SP-CPD-04-08

Parameter / Equipment	Range	Calibration and Measurement Capability [Expressed as Uncertainty( $\pm$ )]	Reference Standard or Equipment	Methods
<sup>2</sup> Height Gauge Dial and Digital (Cont.)	(600 to 700) mm (700 to 800) mm (800 to 900) mm (900 to 1 000) mm	9.5 $\mu$ m 10.8 $\mu$ m 12.1 $\mu$ m 13.5 $\mu$ m	Gauge Block Set	SP-CPD-04-08
Feeler Gauge / Thickness Plate	Up to 1 mm (1 to 5) mm	0.21 $\mu$ m 0.22 $\mu$ m	ULM	SP-CPD-04-09
Measuring Foil Standard Foil	Up to 1 mm (1 to 5) mm	0.21 $\mu$ m 0.22 $\mu$ m	ULM	SP-CPD-04-10
<sup>2</sup> Indicator	Up to 20 mm (20 to 30) mm (30 to 40) mm (40 to 50) mm (50 to 60) mm (60 to 70) mm (70 to 80) mm (80 to 90) mm (90 to 100) mm	0.6 $\mu$ m 0.7 $\mu$ m 0.8 $\mu$ m 0.9 $\mu$ m 1.0 $\mu$ m 1.1 $\mu$ m 1.2 $\mu$ m 1.3 $\mu$ m 1.5 $\mu$ m	Gauge Block	SP-CPD-04-11
<sup>2</sup> Linear Length Gauge / Electrical Comparators / Mu Checker	Up to 5 mm (5 to 12) mm (12 to 20) mm (20 to 25) mm (25 to 50) mm	0.1 $\mu$ m 0.2 $\mu$ m 0.3 $\mu$ m 0.4 $\mu$ m 0.7 $\mu$ m	Gauge Block	SP-CPD-04-12
Steel Ruler	Up to 100 mm (100 to 200) mm (200 to 300) mm (300 to 400) mm (400 to 500) mm (500 to 600) mm (600 to 700) mm (700 to 800) mm (800 to 900) mm (900 to 1 200) mm (1 200 to 1 500) mm (1 500 to 1 800) mm (1 800 to 2 000) mm	3 $\mu$ m 4 $\mu$ m 5 $\mu$ m 6 $\mu$ m 7 $\mu$ m 9 $\mu$ m 10 $\mu$ m 11 $\mu$ m 12 $\mu$ m 16 $\mu$ m 20 $\mu$ m 24 $\mu$ m 27 $\mu$ m	3D Vision Measuring Machine	SP-CPD-04-13

Parameter / Equipment	Range	Calibration and Measurement Capability [Expressed as Uncertainty( $\pm$ )]	Reference Standard or Equipment	Methods
Steel Tape & Textile Tape	Up to 200 mm (200 to 400) mm (400 to 600) mm (600 to 800) mm (800 to 1 000) mm (1 000 to 1 200) mm (1 200 to 1 400) mm (1 400 to 1 600) mm (1 600 to 1 800) mm (1 800 to 2 000) mm (2 000 to 3 000) mm (3 000 to 4 000) mm (4 000 to 5 000) mm (5 000 to 6 000) mm (6 000 to 7 000) mm (7 000 to 8 000) mm (8 000 to 9 000) mm (9 000 to 10 000) mm (10 000 to 20 000) mm (20 000 to 30 000) mm (30 000 to 40 000) mm (40 000 to 50 000) mm	0.004 mm 0.012 mm 0.017 mm 0.03 mm 0.05 mm 0.06 mm 0.09 mm 0.13 mm 0.14 mm 0.19 mm 0.40 mm 0.74 mm 1.1 mm 1.6 mm 2.2 mm 2.9 mm 3.6 mm 4.5 mm 18 mm 40 mm 71 mm 111 mm	3D Vision Measuring Machine	SP-CPD-04-14
<sup>2</sup> Depth Micro Checker, Step Gauge, Inside Checker,  Anvil Block	Up to 100 mm (100 to 200) mm (200 to 250) mm (250 to 300) mm  Up to 25 mm	2 $\mu$ m 3 $\mu$ m 4 $\mu$ m 5 $\mu$ m  2 $\mu$ m	Gauge Block/ Linear Height Master	SP-CPD-04-15
<sup>2</sup> Depth Gauge, Depth Micrometer	Up to 25 mm (25 to 50) mm (50 to 100) mm (100 to 150) mm (150 to 250) mm (250 to 300) mm (300 to 400) mm (400 to 450) mm	0.7 $\mu$ m 0.9 $\mu$ m 1 $\mu$ m 2 $\mu$ m 3 $\mu$ m 4 $\mu$ m 5 $\mu$ m 6 $\mu$ m	Gauge Block Set	SP-CPD-04-16
<sup>2</sup> Surface Plate	(< 150 x 150) mm (< 300 x 300) mm (< 400 x 400) mm	0.0016 mm 0.0043 mm 0.0074 mm	Dial indicator / Straightedge	SP-CPD-04-17

Parameter / Equipment	Range	Calibration and Measurement Capability [Expressed as Uncertainty(±)]	Reference Standard or Equipment	Methods
<sup>2</sup> Surface Plate (Cont.)	(< 500x500) mm (< 600x600) mm (< 750x750) mm (< 900x900) mm (< 1 000 x 1 000) mm (< 1 100 x 1 100) mm (< 1 200 x 1 200) mm (< 1 400 x 1 400) mm (< 1 500 x 1 500) mm (< 1 600 x 1 600) mm (< 1 800 x 1 800) mm (< 2 000 x 2 000) mm (< 2 300 x 2 300) mm (< 2 500 x 2 500) mm (< 2 600 x 2 600) mm (< 2 800 x 2 800) mm (< 3 000 x 3 000) mm (< 4 000 x 4 000) mm (< 5 000 x 5 000) mm (< 6 000 x 6 000) mm (< 7 000 x 7 000) mm (< 8 000 x 8 000) mm (< 9 000 x 9 000) mm (< 10 000 x 10 000) mm	0.01 mm 0.02 mm 0.03 mm 0.04 mm 0.05 mm 0.05 mm 0.07 mm 0.09 mm 0.10 mm 0.12 mm 0.15 mm 0.18 mm 0.24 mm 0.28 mm 0.31 mm 0.36 mm 0.41 mm 0.73 mm 1.1 mm 1.6 mm 2.2 mm 2.9 mm 3.7 mm 4.5 mm	Dial indicator / Straightedge	SP-CPD-04-17
Plain Plug Gauge, Pin Gauge, Three Wires, T-probe	Up to 15 mm (15 to 22) mm (22 to 30) mm (30 to 40) mm (40 to 50) mm (50 to 60) mm (60 to 70) mm (70 to 80) mm (80 to 90) mm (90 to 100) mm (100 to 150) mm (150 to 200) mm (200 to 250) mm (250 to 300) mm	0.3 µm 0.4 µm 0.5 µm 0.6 µm 0.7 µm 0.9 µm 1.0 µm 1.2 µm 1.3 µm 1.4 µm 2.0 µm 2.7 µm 3.4 µm 4.0 µm	ULM / Gauge Block	SP-CPD-04-18
Plain Ring Gauge	Up to 3 mm (3 to 6) mm (6 to 10) mm	0.44 µm 0.45 µm 0.46 µm	ULM / Plain Ring Gauge	SP-CPD-04-19

Parameter / Equipment	Range	Calibration and Measurement Capability [Expressed as Uncertainty(±)]	Reference Standard or Equipment	Methods
Plain Ring Gauge (Cont.)	(10 to 12) mm (12 to 16) mm (16 to 18) mm (18 to 20) mm (20 to 22) mm (22 to 25) mm (25 to 28) mm (28 to 30) mm (30 to 75) mm (75 to 100) mm (100 to 300) mm	0.48 μm 0.50 μm 0.51 μm 0.53 μm 0.57 μm 0.59 μm 0.61 μm 0.63 μm 2.28 μm 3.13 μm 4.89 μm	ULM / Plain Ring Gauge	SP-CPD-04-19
Thread Plug Gauge ( Pitch )  ( Major )	(M2 to M10) mm (M10 to M20) mm (M20 to M50) mm (M50 to M70) mm (M70 to M100) mm (M100 to M150) mm  (M2 to M10) mm (M10 to M20) mm (M20 to M30) mm (M30 to M40) mm (M40 to M50) mm (M50 to M60) mm (M60 to M70) mm (M70 to M80) mm (M80 to M90) mm (M90 to M100) mm (M100 to M125) mm (M125 to M150) mm	0.47 μm 0.49 μm 0.51 μm 0.55 μm 0.61 μm 0.63 μm  0.3 μm 0.4 μm 0.5 μm 0.6 μm 0.7 μm 0.9 μm 1.0 μm 1.2 μm 1.3 μm 1.4 μm 1.7 μm 2.0 μm	ULM / 3 Wire / Gauge Block	SP-CPD-04-20
Thread Ring Gauge ( Pitch )	(M2 to M5) mm (M5 to M8) mm (M8 to M10) mm (M10 to M12) mm (M12 to M18) mm (M18 to M20) mm (M20 to M25) mm (M25 to M30) mm (M30 to M75) mm (M75 to M90) mm (M90 to M100) mm	0.57 μm 0.58 μm 0.59 μm 0.60 μm 0.63 μm 0.64 μm 0.68 μm 0.72 μm 2.30 μm 2.39 μm 2.46 μm	ULM / Plain Ring Gauge	SP-CPD-04-21

Parameter / Equipment	Range	Calibration and Measurement Capability [Expressed as Uncertainty( $\pm$ )]	Reference Standard or Equipment	Methods
Thread Ring Gauge (Cont.) ( Pitch )  ( Minor )	(M100 to M125) mm (M125 to M150) mm  (M2 to M8) mm (M8 to M20) mm (M20 to M30) mm (M30 to M75) mm (M75 to M90) mm (M90 to M100) mm (M100 to M125) mm (M125 to M150) mm	2.66 $\mu$ m 2.87 $\mu$ m  0.4 $\mu$ m 0.5 $\mu$ m 0.6 $\mu$ m 1.1 $\mu$ m 1.3 $\mu$ m 1.4 $\mu$ m 1.8 $\mu$ m 2.1 $\mu$ m	ULM / Plain Ring Gauge	SP-CPD-04-21
<sup>2</sup> Check Master /Caliper Checker	Up to 100 mm (100 to 125) mm (125 to 150) mm (150 to 175) mm (175 to 200) mm (200 to 250) mm (250 to 300) mm (300 to 400) mm (400 to 500) mm (500 to 600) mm (600 to 700) mm	2.7 $\mu$ m 2.9 $\mu$ m 3.1 $\mu$ m 3.3 $\mu$ m 3.6 $\mu$ m 4.1 $\mu$ m 4.7 $\mu$ m 5.9 $\mu$ m 7.1 $\mu$ m 8.4 $\mu$ m 9.7 $\mu$ m	Linear Height Master / Gauge Block	SP-CPD-04-22
<sup>2</sup> Dial Gauge Tester, Calibration Tester	Up to 5 mm (5 to 12) mm (12 to 20) mm (20 to 25) mm (25 to 50) mm	0.65 $\mu$ m 0.66 $\mu$ m 0.68 $\mu$ m 0.70 $\mu$ m 0.73 $\mu$ m	Liner Gauge with Display	SP-CPD-04-23
Plain Snap Gauge/Gap Gauge (External)	(2 to 4) mm (4 to 16) mm (16 to 22) mm (22 to 30) mm (30 to 75) mm (75 to 100) mm (100 to 200) mm (200 to 300) mm (300 to 400) mm (400 to 500) mm	0.2 $\mu$ m 0.3 $\mu$ m 0.4 $\mu$ m 0.5 $\mu$ m 1.1 $\mu$ m 1.4 $\mu$ m 2.7 $\mu$ m 4.0 $\mu$ m 5.4 $\mu$ m 6.7 $\mu$ m	ULM / Gauge Block	SP-CPD-04-24



Parameter / Equipment	Range	Calibration and Measurement Capability [Expressed as Uncertainty( $\pm$ )]	Reference Standard or Equipment	Methods
Plain Snap Gauge / Gap Gauge (Cont.) (Internal)	(2 to 6) mm (6 to 20) mm (20 to 30) mm (30 to 75) mm (75 to 100) mm (100 to 300) mm	0.4 $\mu$ m 0.5 $\mu$ m 0.6 $\mu$ m 2.3 $\mu$ m 2.4 $\mu$ m 4.5 $\mu$ m	ULM / Plain Ring Gauge	SP-CPD-04-24
<sup>2</sup> Hole test, Three-Point Micrometer	(2 to 3) mm (3 to 8) mm (8 to 18) mm (18 to 20) mm (20 to 25) mm (25 to 28) mm (28 to 30) mm 75 mm	0.8 $\mu$ m 0.9 $\mu$ m 1.2 $\mu$ m 1.3 $\mu$ m 1.4 $\mu$ m 1.5 $\mu$ m 1.7 $\mu$ m 3.0 $\mu$ m	Master Ring Gauge	SP-CPD-04-25
Dial Test Indicator	Up to 1.6 mm	0.3 $\mu$ m	ULM	SP-CPD-04-26
<sup>2</sup> Universal Length Measuring Machine	Up to 1 mm (1 to 3) mm (3 to 5) mm (5 to 10) mm (10 to 25) mm (25 to 50) mm (50 to 75) mm (75 to 100) mm (100 to 125) mm (125 to 150) mm (150 to 175) mm (175 to 200) mm (200 to 250) mm (250 to 300) mm (300 to 400) mm (400 to 500) mm	0.06 $\mu$ m 0.07 $\mu$ m 0.09 $\mu$ m 0.15 $\mu$ m 0.34 $\mu$ m 0.67 $\mu$ m 1.00 $\mu$ m 1.33 $\mu$ m 1.71 $\mu$ m 2.05 $\mu$ m 2.38 $\mu$ m 2.71 $\mu$ m 3.38 $\mu$ m 4.05 $\mu$ m 5.39 $\mu$ m 6.73 $\mu$ m	Gauge Block	SP-CPD-04-27
<sup>2</sup> Vernier Depth Gauge	Up to 200 mm (200 to 300) mm (300 to 400) mm (400 to 500) mm (500 to 600) mm	6 $\mu$ m 7 $\mu$ m 8 $\mu$ m 9 $\mu$ m 10 $\mu$ m	Gauge Block Set	SP-CPD-04-28

Parameter / Equipment	Range	Calibration and Measurement Capability [Expressed as Uncertainty( $\pm$ )]	Reference Standard or Equipment	Methods
<sup>2</sup> Vernier Depth Gauge (Cont.)	(600 to 700) mm (700 to 800) mm (800 to 900) mm (900 to 1 000) mm	11 $\mu$ m 12 $\mu$ m 13 $\mu$ m 15 $\mu$ m	Gauge Block Set	SP-CPD-04-28
Bore Gauge / Cylinder Gauge	(0.5 to 10) mm (10 to 30) mm (30 to 50) mm (50 to 70) mm (70 to 100) mm (100 to 125) mm (125 to 150) mm (150 to 175) mm (175 to 200) mm (200 to 250) mm (250 to 300) mm (300 to 400) mm (400 to 500) mm (500 to 600) mm (600 to 700) mm (700 to 800) mm	0.6 $\mu$ m 0.8 $\mu$ m 0.9 $\mu$ m 1.1 $\mu$ m 1.5 $\mu$ m 1.8 $\mu$ m 2.1 $\mu$ m 2.5 $\mu$ m 2.8 $\mu$ m 3.5 $\mu$ m 4.1 $\mu$ m 5.4 $\mu$ m 6.8 $\mu$ m 8.1 $\mu$ m 9.5 $\mu$ m 10.8 $\mu$ m	ULM / Gauge Block	SP-CPD-04-29
<sup>2</sup> Profile Projector	Up to 50 mm (50 to 200) mm (200 to 410) mm	2 $\mu$ m 3 $\mu$ m 7 $\mu$ m	Glass Scale	SP-CPD-04-31
Angle	(0.25 to 30) °	12 second	Angle Block Set	
<sup>2</sup> Measuring Microscope, Optical Comparator, 3D Vision Measuring System	Up to 50 mm (50 to 200) mm (200 to 410) mm	2 $\mu$ m 3 $\mu$ m 7 $\mu$ m	Glass Scale	SP-CPD-04-32
<sup>2</sup> Height Master	Up to 175 mm (175 to 250) mm (250 to 300) mm (300 to 400) mm (400 to 500) mm (500 to 600) mm (600 to 700) mm	3 $\mu$ m 4 $\mu$ m 5 $\mu$ m 6 $\mu$ m 7 $\mu$ m 8 $\mu$ m 10 $\mu$ m	Gauge Block/ Linear Height Master	SP-CPD-04-33

Parameter / Equipment	Range	Calibration and Measurement Capability [Expressed as Uncertainty(±)]	Reference Standard or Equipment	Methods
Bevel Protractor	Up to 30 ° (30 to 45) ° (45 to 90) °  Up to 100 mm (100 to 200) mm (200 to 300) mm	12 second 24 second 48 second  3 μm 4 μm 5 μm	Angle Block  3D Vision Measuring Machine	SP-CPD-04-34
Chamfer Gauge	Up to 10 mm	3 μm	3D Vision Measuring Machine	SP-CPD-04-35
Pitch Gauge	Up to 7 mm	3 μm	3D Vision Measuring Machine	SP-CPD-04-36
Radius Gauge	Up to 100 mm	3 μm	3D Vision Measuring Machine	SP-CPD-04-37
Taper Gauge (Scale Type)	Up to 100 mm	3 μm	3D Vision Measuring Machine	SP-CPD-04-38
Taper Thread Ring	M2 to M5 M5 to M11 M11 to M22 M22 to M45 M45 to M180	0.90 μm 0.91 μm 1.77 μm 5.05 μm 10.99 μm	ULM / Ring Gauge	SP-CPD-04-39
<sup>2</sup> Riser Block	150 mm 300 mm 600 mm	9 μm 10 μm 12 μm	Linear Height Master / Gauge Block	SP-CPD-04-40
Long Gauge Block (Grade 1, 2)	100 mm (100 to 125) mm (125 to 150) mm (150 to 175) mm	1.33 μm 1.71 μm 2.05 μm 2.38 μm	ULM / Gauge Block	SP-CPD-04-41

Parameter / Equipment	Range	Calibration and Measurement Capability [Expressed as Uncertainty(±)]	Reference Standard or Equipment	Methods
Long Gauge Block (Grade 1, 2) (Cont.)	(175 to 200) mm (200 to 250) mm (250 to 300) mm (300 to 400) mm (400 to 500) mm	2.71 µm 3.38 µm 4.05 µm 5.39 µm 6.73 µm	ULM / Gauge Block	SP-CPD-04-41
Standard Micrometer, Setting Rod, Length Bar	Up to 25 mm (25 to 50) mm (50 to 75) mm (75 to 100) mm (100 to 125) mm (125 to 150) mm (150 to 175) mm (175 to 200) mm (200 to 300) mm (300 to 400) mm (400 to 500)mm	0.4 µm 0.7 µm 1.1 µm 1.4 µm 1.7 µm 2.0 µm 2.4 µm 2.7 µm 4.0 µm 5.4 µm 6.7 µm	ULM / Gauge Block	SP-CPD-04-42
Angle Block / Angular	(0.25 to 30) ° (30 to 45) ° (45 to 60) ° (60 to 90) °	12 second 24 second 36 second 48 second	Angle Block / 3D Vision	SP-CPD-04-43
Gauge Block	1 mm (1 to 5) mm (5 to 10) mm (10 to 25) mm (25 to 50) mm (50 to 75) mm (75 to 100) mm	0.22 µm 0.23 µm 0.26 µm 0.43 µm 0.72 µm 1.07 µm 1.39 µm	ULM / Gauge Block	SP-CPD-04-44
Test Sieve	Up to 50 mm	3 µm	3D Vision Measuring Machine	SP-CPD-04-45
Taper Plug Gauge	Up to M7 M7 to M15 M15 to M25 M25 to M30 M30 to M40	0.2 µm 0.3 µm 0.4 µm 0.5 µm 0.6 µm	ULM / Gauge Block	SP-CPD-04-46

Parameter / Equipment	Range	Calibration and Measurement Capability [Expressed as Uncertainty(±)]	Reference Standard or Equipment	Methods
Taper Plug Gauge (Cont.)	M40 to M50 M50 to M60 M60 to M70 M70 to M80 M80 to M90 M90 to M100 M100 to M200 M200 to M300	0.7 µm 0.9 µm 1.0 µm 1.1 µm 1.3 µm 1.4 µm 2.7 µm 4.0 µm	ULM / Gauge Block	SP-CPD-04-46
Taper Ring Gauge	M2 to M6 M6 to M20 M20 to M30 M30 to M75 M75 to M100 M100 to M150	0.4 µm 0.5 µm 0.6 µm 2.3 µm 2.4 µm 2.9 µm	ULM / Ring Gauge	SP-CPD-04-47
Taper Thread Plug	M2 to M5 M5 to M11 M11 to M22 M22 to M45 M45 to M180	0.92 µm 1.78 µm 1.07 µm 4.65 µm 7.55 µm	ULM / 3 Wire	SP-CPD-04-48
<sup>2</sup> Coordinate Measuring Machine X, Y, Z Axis	Up to 10 mm (10 to 25) mm (25 to 50) mm (50 to 75) mm (75 to 100) mm (100 to 125) mm (125 to 150) mm (150 to 175) mm (175 to 200) mm (200 to 250) mm (250 to 300) mm (300 to 400) mm (400 to 500) mm (500 to 800) mm (800 to 1 000) mm (1 000 to 1 200) mm (1 200 to 1 500) mm	0.16 µm 0.34 µm 0.67 µm 1.00 µm 1.33 µm 1.71 µm 2.05 µm 2.38 µm 2.71 µm 3.38 µm 4.05 µm 5.39 µm 6.73 µm 10.78 µm 13.45 µm 16.16 µm 20.20 µm	Gauge Block	SP-CPD-04-49

## II. Mechanical Calibration

Parameter / Equipment	Range	Calibration and Measurement Capability [Expressed as Uncertainty( $\pm$ )]	Reference Standard or Equipment	Methods
<sup>2</sup> Electronic Balance, Spring Balance, Load Cell	Up to 10 g (10 to 20) g (20 to 50) g (50 to 60) g (60 to 70) g (70 to 100) g (100 to 150) g (150 to 220) g (220 to 300) g (300 to 1 000) g (1 000 to 2 000) g (2 to 3) kg (3 to 5) kg (5 to 6) kg (6 to 8) kg (8 to 10) kg (10 to 12) kg (12 to 20) kg (20 to 100) kg (100 to 1 000) kg	0.04 mg 0.05 mg 0.08 mg 0.11 mg 0.12 mg 0.16 mg 0.2 mg 0.3 mg 0.4 mg 1 mg 2 mg 3 mg 5 mg 10 mg 12 mg 17 mg 20 mg 26 mg 5.8 g 58 g	Weight Set	SP-CPM-04-01
<sup>2</sup> Push-Pull Gauge, Force Gauge, Tension, Tensile	Up to 1 000 N (1 000 to 3 000) N (3 000 to 5 000) N (5 000 to 10 000) N	0.006 N 0.01 N 0.02 N 0.03 N	Weight Set	SP-CPM-04-02
<sup>2</sup> Hand Torque Tool, Torque Wrench, Torque Driver, Electronic Torque	0.2 to 20) N.m (20 to 40) N.m (40 to 60) N.m (60 to 80) N.m (80 to 100) N.m (100 to 200) N.m (200 to 400) N.m (400 to 600) N.m (600 to 800) N.m (800 to 1 000) N.m	0.06 N.m 0.07 N.m 0.08 N.m 0.09 N.m 0.10 N.m 3.12 N.m 3.53 N.m 3.90 N.m 4.40 N.m 5.00 N.m	Static Torque Transducer	SP-CPM-04-03
<sup>2</sup> Hardness Tester, Duro Tester Type (A, B, O)	Up to 30 30 to 40 40 to 100	0.6 0.7 0.9	Weight Set	SP-CPM-04-04

Parameter / Equipment	Range	Calibration and Measurement Capability [Expressed as Uncertainty(±)]	Reference Standard or Equipment	Methods
Hardness Tester, Duro Tester Type (C, D, DO) (Cont.)	Up to 20 20 to 30 30 to 40 40 to 50 50 to 60 60 to 70 70 to 80 80 to 90 90 to 100	1.2 2.1 2.4 2.3 2.7 3.9 4.3 6.1 6.5	Weight Set	SP-CPM-04-04
<sup>2</sup> Pressure Gauge (Pneumatic &Hydraulic), Digital Pressure Gauge, Pressure Transducer, Differential Pressure Gauge, Pressure Transmitter, Manometer, Pressure Switch  Vacuum Gauge	(0 to 2) bar (2 to 70) bar (70 to 700) bar          (-1 to 0) bar	0.11 bar 0.13 bar 0.17 bar          0.11 bar	Pressure Calibrator	SP-CPM-04-05
Mass	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	0.06 mg 0.06 mg 0.06 mg 0.06 mg 0.06 mg 0.06 mg 0.06 mg 0.07 mg 0.07 mg 0.07 mg 0.07 mg 0.08 mg 0.1 mg 0.18 mg 0.31 mg 58 mg 58 mg	Weight	SP-CPM-04-06



Parameter / Equipment	Range	Calibration and Measurement Capability [Expressed as Uncertainty( $\pm$ )]	Reference Standard or Equipment	Methods
Mass (Cont.)	2 kg 5 kg 10 kg 20 kg	58 mg 59 mg 60 mg 66 mg	Weight	SP-CPM-04-06
Torque Calibrator	(0 to 2) N.m (2 to 4) N.m (4 to 6) N.m (6 to 8) N.m (8 to 10) N.m (10 to 20) N.m (20 to 40) N.m (40 to 200) N.m (200 to 400) N.m (400 to 1 000) N.m (1 000 to 1 500) N.m	0.92% 0.46% 0.31% 0.23% 0.18% 0.10% 0.05% 0.03% 0.02% 0.01% 0.006%	Weight / Calibration arm	SP-CPM-04-07

### III. Thermodynamic Calibration

Parameter / Equipment	Range	Calibration and Measurement Capability [Expressed as Uncertainty( $\pm$ )]	Reference Standard or Equipment	Methods
<sup>2</sup> Temperature Controlled Chamber Hot Air Oven, Incubator, Refrigerator Low Temperature Incubator	(0 to 200) °C	0.8 °C	Agilent 34970A / Thermocouple	SP-CPT-04-01
<sup>2</sup> Temperature Gauge & Dial Thermometer	(-40 to 250) °C (250 to 500) °C (500 to 650) °C	0.07 °C 0.7 °C 2.6 °C	Thermocouple Standard (PRT), (SRT)	SP-CPT-04-02



<b>Parameter / Equipment</b>	<b>Range</b>	<b>Calibration and Measurement Capability [Expressed as Uncertainty(±)]</b>	<b>Reference Standard or Equipment</b>	<b>Methods</b>
<sup>2</sup> Thermocouple Sensor TC	(-40 to 0) °C (0 to 250) °C (250 to 500) °C (500 to 1 200) °C	0.07 °C 0.07 °C 0.7 °C 2.6 °C	Thermocouple Standard (PRT), (SRT)	SP-CPT-04-03
<sup>2</sup> Liquid Bath	(0 to 200) °C	0.8 °C	Agilent 34970A / Thermocouple	SP-CPT-04-04
<sup>2</sup> Digital Thermometer With Sensor Type K, J, E, T, N, R, S	(-40 to 0) °C (0 to 250) °C (250 to 500) °C (500 to 1 200) °C	0.07 °C 0.07 °C 0.7 °C 2.6 °C	Thermocouple Standard (PRT) Thermocouple Standard (SRT)	SP-CPT-04-05
<sup>2</sup> Digital Thermometer With Sensor Type RTD & Thermistor Sensor	(-40 to 0) °C (0 to 250) °C (250 to 500) °C (500 to 850) °C	0.07 °C 0.07 °C 0.7 °C 2.6 °C	Thermocouple Standard (PRT) Thermocouple Standard (SRT)	SP-CPT-04-06
<sup>2</sup> Thermocouple Sensor RTD	(-40 to 0) °C (0 to 250) °C (250 to 500) °C (500 to 850) °C	0.07 °C 0.07 °C 0.7 °C 2.6 °C	Thermocouple Standard (PRT), (SRT)	SP-CPT-04-07
Liquid in Glass	(-40 to 250) °C	0.29 °C	Thermocouple Standard (PRT)	SP-CPT-04-08
Dry Block, Dry Well	Up to 250 °C (250 to 450) °C (450 to 1 200) °C	0.07 °C 0.70 °C 2.60 °C	Thermocouple Standard (PRT), (SRT)	SP-CPT-04-10

Parameter / Equipment	Range	Calibration and Measurement Capability [Expressed as Uncertainty( $\pm$ )]	Reference Standard or Equipment	Methods
Digital Thermometer with Surface Probe	(40 to 350) °C	2.4 °C	Digital Thermometer with Surface Probe	SP-CPT-04-11
Infrared Thermometer	(-40 to 250) °C (250 to 450) °C (450 to 650) °C	0.30 °C 0.76 °C 2.62 °C	Thermocouple Standard (PRT), (SRT)	SP-CPT-04-12
Thermo Hygrometer Temperature Humidity	(20 to 40) °C (30 to 70) %RH	0.6 °C 3.2 %RH	Data Logger	SP-CPT-04-13
<sup>2</sup> Humidity Chamber Temperature Humidity	(20 to 40) °C (30 to 70) %RH	0.6 °C 3.3 %RH	Data Logger	SP-CPT-04-14

#### IV. Chemical Calibration

Parameter / Equipment	Range	Calibration and Measurement Capability [Expressed as Uncertainty( $\pm$ )]	Reference Standard or Equipment	Methods
pH Meter	4.01 pH 7.01 pH 10.01 pH	0.01 pH 0.01 pH 0.01 pH	pH Solution Buffer	SP-CPC-04-01
Conductivity	84 $\mu$ S/cm 1413 $\mu$ S/cm 12880 $\mu$ S/cm	1 $\mu$ S/cm 5 $\mu$ S/cm 50 $\mu$ S/cm	Conductivity Solution	SP-CPC-04-02
TDS	1382 ppm	5 ppm	TDS Solution	SP-CPC-04-03

## V. Electromagnetic – DC/Low Frequency

Parameter / Equipment	Range	Calibration and Measurement Capability [Expressed as Uncertainty( $\pm$ )]	Reference Standard or Equipment	Methods
<sup>2</sup> Sound Level Meter	94 dB 114 dB	0.15 dB 0.15 dB	Sound Level Calibrator	SP-CPE-04-01
<sup>2</sup> Temperature Indicator (Simulator) Type RTD (Pt100) Temperature Indicator Type E Type J Type K Type R and S Type T	(-200 to 800) °C  (-250 to 1 000) °C (-210 to 1 200) °C (-200 to 1 372) °C ( 0 to 1 768) °C (-250 to 400) °C	0.25 °C  0.42 °C 0.45 °C 0.38 °C 0.96 °C 0.64 °C	Fluke 744	SP-CPE-04-02

## VI. Dimensional Inspection / Measurement (Testing)

Parameter / Equipment	Range	Calibration and Measurement Capability [Expressed as Uncertainty( $\pm$ )]	Reference Standard or Equipment	Methods
Jig, Fixture and Mold, Die	<b>X Axis</b> Up to 25 mm (25 to 50) mm (50 to 75) mm (75 to 100) mm (100 to 125) mm (125 to 150) mm (150 to 175) mm (175 to 200) mm (200 to 250) mm (250 to 300) mm (300 to 400) mm (400 to 500) mm (500 to 600) mm	0.0027 mm 0.0028 mm 0.0029 mm 0.0030 mm 0.0032 mm 0.0034 mm 0.0036 mm 0.0038 mm 0.0043 mm 0.0049 mm 0.0060 mm 0.0072 mm 0.0085 mm	Coordinate Measuring Machine	SP-CPD-04-50

Parameter / Equipment	Range	Calibration and Measurement Capability [Expressed as Uncertainty( $\pm$ )]	Reference Standard or Equipment	Methods
Jig, Fixture and Mold, Die (Cont.)	<b>Y Axis</b> Up to 25 mm (25 to 50) mm (50 to 75) mm (75 to 100) mm (100 to 125) mm (125 to 150) mm (150 to 175) mm (175 to 200) mm (200 to 250) mm (250 to 300) mm (300 to 400) mm (400 to 500) mm (500 to 700) mm  <b>Z Axis</b> Up to 25 mm (25 to 50) mm (50 to 75) mm (75 to 100) mm (100 to 125) mm (125 to 150) mm (150 to 175) mm (175 to 200) mm (200 to 250) mm (250 to 300) mm (300 to 400) mm (400 to 500) mm	0.0027 mm 0.0028 mm 0.0029 mm 0.0030 mm 0.0032 mm 0.0034 mm 0.0036 mm 0.0038 mm 0.0043 mm 0.0049 mm 0.0060 mm 0.0072 mm 0.0098 mm  0.0027 mm 0.0028 mm 0.0029 mm 0.0030 mm 0.0032 mm 0.0034 mm 0.0036 mm 0.0038 mm 0.0043 mm 0.0049 mm 0.0060 mm 0.0072 mm	Coordinate Measuring Machine	SP-CPD-04-50

**Notes:**

1. Calibration and Measurement Uncertainties (Expanded Uncertainty) are based on approximately a 95% confidence interval, using a coverage of k=2
2. Capabilities are available for on-site calibration activity.
3. This laboratory's capabilities include laboratory and on-site calibration services. Since field (on-site) conditions are typically more variable than those in the laboratory, larger measurement uncertainties are expected in the field (on-site) than what is reported on the scope of accreditation.
4. This scope is part of and must be included with the Certificate of Accreditation No. ACT- 2050

  
 Vice President