



National Association of Testing Authorities, Australia
SCOPE OF ACCREDITATION

Australian Calibrating Services (A'sia) Pty Ltd - ACS
VICTORIAN LABORATORY

| Accreditation Number: 1239 | Site Number: 1232 |

Address Details:

126 Oxford Street
 COLLINGWOOD, VIC 3066
 AUSTRALIA

Website: www.auscal.com.au

Contact Details:

Mr J Kennon
 +61(03) 94175688
timkennon@auscal.com.au

Availability: Services available to external clients

Note: Not all of the columns of the scope of accreditation displayed include data.

The only data displayed is that deemed relevant and necessary for the clear description of the activities and services covered by the scope of accreditation.

Grey text appearing in a SoA is additional freetext providing further refinement or information on the data in the preceding line entry.

ISO/IEC 17025 (2005)
Calibration

SERVICE	PRODUCT	DETERMINANT	TECHNIQUE	PROCEDURE	LIMITATION/RANGE
DC and low frequency electrical metrology - Electrical instrument calibrators	Instrument calibrators	AC current	Comparison with a reference standard		Trip current for RCD/ELCD testers from 5 mA to 1 A

CAPABILITY

with Calibration and Measurement Capability of -
 1% reading from 5 mA to 500 mA
 3% reading above 500 mA to 1 A

		Resistance	Comparison with a reference standard		5 Ω to 500 kΩ
--	--	------------	--------------------------------------	--	---------------

CAPABILITY

with Calibration and Measurement Capability of -
 0.1% reading from 5 Ω to 25 Ω
 0.02% reading above 25 Ω to 500 kΩ

		DC current	Comparison with a reference standard		4 mA to 24 mA
--	--	------------	--------------------------------------	--	---------------

| Accreditation Number: 1239 | Site Number: 1232 | Printed on : 30-Dec-2019



National Association of Testing Authorities, Australia

SCOPE OF ACCREDITATION

CAPABILITY

with Calibration and Measurement Capability of -
0.0013 mA

		DC voltage	Comparison with a reference standard		10 mV to 50 V
--	--	------------	--------------------------------------	--	---------------

CAPABILITY

with Calibration and Measurement Capability of -
0.04% reading from 10 mV to 40 mV
0.01% reading above 40 mV to 50V

DC and low frequency electrical metrology - Electrical measurement and test equipment	Ammeters	DC current	Comparison with a reference standard		0.05 μ A to 1000 A
---	----------	------------	--------------------------------------	--	------------------------

CAPABILITY

with Calibration and Measurement Capability of -
0.05 μ A + 0.02% reading from 1 μ A to 3.3 mA
2.5 μ A + 0.012% reading above 3.3 mA to 330 mA
40 μ A + 0.04% reading above 330 mA to 3 A
500 μ A + 0.05% reading above 3 A to 11 A
750 μ A + 0.10% reading above 11 A to 20.5 A
0.4% reading from 20 A to 1000 A for clamp-on meters using multiple turns

		AC current	Comparison with a reference standard		100 μ A to 1000 A 10 Hz to 30 kHz
--	--	------------	--------------------------------------	--	--

CAPABILITY

with Calibration and Measurement Capability of -
100 nA + 0.20% reading from 100 μ A to 330 μ A and 10 Hz to 1 kHz
150 nA + 0.30% reading from 100 μ A to 330 μ A and 1 kHz to 5 kHz
200 nA + 0.80% reading from 100 μ A to 330 μ A and 5 kHz to 10 kHz
400 nA + 1.60% reading from 100 μ A to 330 μ A and 10 kHz to 30 kHz
200 nA + 0.20% reading from 330 μ A to 3.3 mA and 10 Hz to 5 kHz
600 nA + 1.00% reading from 330 μ A to 3.3 mA and 5 kHz to 30 kHz
2 μ A + 0.18% reading from 3.3 mA to 33 mA and 10 Hz to 45 Hz
2 μ A + 0.04% reading from 3.3 mA to 33 mA and 45 Hz to 1 kHz
2 μ A + 0.08% reading from 3.3 mA to 33 mA and 1 kHz to 5 kHz
200 μ A + 0.40% reading from 3.3 mA to 33 mA and 5 kHz to 30 kHz
20 μ A + 0.18% reading from 33 mA to 330 mA and 10 Hz to 45 Hz
20 μ A + 0.04% reading from 33 mA to 330 mA and 45 Hz to 1 kHz
100 μ A + 0.20% reading from 33 mA to 330 mA and 1 kHz to 10 kHz
200 μ A + 0.40% reading from 33 mA to 330 mA and 10 kHz to 30 kHz
100 μ A + 0.183% reading from 330 mA to 3 A and 10 Hz to 45 Hz
100 μ A + 0.063% reading from 330 mA to 3 A and 45 Hz to 1 kHz
1 mA + 0.063% reading from 330 mA to 3 A and 1 kHz to 5 kHz
2 mA + 0.10% reading from 3 A to 11 A and 45 Hz to 1 kHz
2 mA + 3.00% reading from 3 A to 11 A and 1 kHz to 5 kHz
5 mA + 0.15% reading from 11 A to 20.5 A and 45 Hz to 1 kHz

| Accreditation Number: 1239 | Site Number: 1232 | Printed on : 30-Dec-2019



National Association of Testing Authorities, Australia

SCOPE OF ACCREDITATION

10 mA + 0.6% reading from 3.2 to 10.5 A and 3 kHz to 10 kHz
 0.45% reading from 20 A to 1000 A and 10 Hz to 100 Hz for clamp-on meters
 using multiple turns

	Ohm meters	Resistance	Comparison with a reference standard		1 Ω to 110 M Ω
--	------------	------------	--------------------------------------	--	------------------------------

CAPABILITY

with Calibration and Measurement Capability of -

15 m Ω + 0.01% reading from 1 Ω to 33 Ω
 20 m Ω + 0.003% reading above 33 Ω to 330 Ω
 0.2 Ω + 0.003% reading above 330 Ω to 3.3 k Ω
 1 Ω + 0.003% reading above 3.3 k Ω to 33 k Ω
 10 Ω + 0.003% reading above 33 k Ω to 330 k Ω
 150 Ω + 0.006% reading above 330 k Ω to 33 M Ω
 2500 Ω + 0.03% reading above 3.3 M Ω to 33 M Ω
 3000 Ω + 0.05% reading above 33 M Ω to 110 M Ω
 0.6% reading for portable appliance testers down to 0.1 Ω

	Voltmeters	DC voltage	Comparison with a reference standard		10 mV to 1020 V
--	------------	------------	--------------------------------------	--	-----------------

CAPABILITY

with Calibration and Measurement Capability of -

1 μ V + 0.0024% reading from 10 mV to 330 mV
 20 μ V + 0.0020% reading above 300 mV to 33 V
 150 μ V + 0.0018% reading above 33 V to 330 V
 1500 μ V + 0.0018% reading above 330 V to 1020 V

		AC voltage	Comparison with a reference standard		10 mV to 1020 V 10 Hz to 100 kHz
--	--	------------	--------------------------------------	--	-------------------------------------

CAPABILITY

with Calibration and Measurement Capability of -

6 μ V + 0.08% reading from 10 mV to 33 mV and 10 Hz to 45 Hz
 6 μ V + 0.02% reading from 10 mV to 33 mV and 45 Hz to 20 kHz
 6 μ V + 0.10% reading from 10 mV to 33 mV and 20 kHz to 50 kHz
 8 μ V + 0.03% reading from 33 mV to 330 mV and 10 Hz to 20 kHz
 8 μ V + 0.06% reading from 33 mV to 330 mV and 20 kHz to 50 kHz
 32 μ V + 0.09% reading from 33 mV to 330 mV and 50 kHz to 100 kHz
 50 μ V + 0.03% reading from 330 mV to 3.3 V and 10 Hz to 50 kHz
 125 μ V + 0.07% reading from 330 mV to 3.3 V and 50 kHz to 100 kHz
 0.65 mV + 0.03% reading from 3.3 V to 33 V and 10 Hz to 45 Hz
 0.6 mV + 0.015% reading from 3.3 V to 33 V and 45 Hz to 10 kHz
 0.6 mV + 0.035% reading from 3.3 V to 33 V and 10 kHz to 50 kHz
 1.6 mV + 0.09% reading from 3.3 V to 33 V and 50 kHz to 100 kHz
 2 mV + 0.02% reading from 33 V to 330 V and 45 Hz to 1 kHz
 6 mV + 0.03% reading from 33 V to 330 V and 1 kHz to 50 kHz
 50 mV + 0.20% reading from 33 V to 330 V and 50 kHz to 100 kHz
 10 mV + 0.03% reading from 330 V to 1020 V and 45 Hz to 10 kHz

DC and low frequency	Current shunts	Current	Comparison with a		From 0.01 Ω to 100 Ω at maximum current
----------------------	----------------	---------	-------------------	--	---



National Association of Testing Authorities, Australia

SCOPE OF ACCREDITATION

electrical metrology - Electrical standards			reference standard		of 10 A
CAPABILITY with Calibration and Measurement Capability of - 0.7% reading					
	Conductance boxes; Precision resistors; Resistance boxes;	Resistance	Comparison with a reference standard		0.1 Ω to 100 M Ω
CAPABILITY with Calibration and Measurement Capability of - 0.12% reading from 0.1 Ω to 100 Ω 0.012% reading above 100 Ω to 1 k Ω 0.05% reading above 1 k Ω to 10 M Ω 0.8% reading above 10 Ω to 100 M Ω					
Dimensional metrology - Engineering equipment and precision instruments	Micrometer setting gauges	Length measurements	Comparison with a reference standard		Up to 1200 mm
CAPABILITY with Calibration and Measurement Capability of - (1 + 0.007L) μm where L is the length in mm					
	Depth and height micrometers	Length measurements	Comparison with a reference standard		1 mm to 600 mm
CAPABILITY with Calibration and Measurement Capability of - 2 μm from 1 to 125 mm (1.1+L/180) μm above 125 to 600 mm where L is the indicated depth in mm					
	Bore gauges	Length measurements	Comparison with a reference standard		2 mm to 200 mm
CAPABILITY with Calibration and Measurement Capability of - 2.5 μm from 2 mm to 50 mm 3.5 μm above 50 mm to 200 mm					
	Micrometer heads	Length measurements	Comparison with a reference standard	Including compliance with AS 2328	



National Association of Testing Authorities, Australia

SCOPE OF ACCREDITATION

CAPABILITY

with Calibration and Measurement Capability of -
($0.4+0.6R$) μm where R is the resolution in μm

	Dial gauges	Length measurements	Comparison with a reference standard	Dial gauges and other displacement measuring devices	
--	-------------	---------------------	--------------------------------------	--	--

CAPABILITY

with Calibration and Measurement Capability of -

Dial Gauges

($0.8 + 0.032L$) μm where L is the range in mm from 1 mm to 100 mm

Digital Indicators

($0.8 + 0.013L$) μm where L is the range in mm from 1 mm to 100 mm

Dial Test Indicators

($0.8 + 100R$) μm where R is the resolution in mm

	Dial gauges; Thickness gauges;	Length measurements	Comparison with a reference standard	Including compliance with AS 2103	1 mm to 100 mm
--	-----------------------------------	---------------------	--------------------------------------	-----------------------------------	----------------

CAPABILITY

with Calibration and Measurement Capability of -
($0.8 + 0.032L$) μm where L is the range in mm

	External micrometers	Length measurements	Comparison with a reference standard	Including compliance with AS 2102	Up to 1200 mm
--	----------------------	---------------------	--------------------------------------	-----------------------------------	---------------

CAPABILITY

with Calibration and Measurement Capability of -

1.8 μm up to 25 mm

2.6 μm above 25 mm to 100 mm

($1.8+0.01L$) μm where L is the length in mm

above 100 mm to 1200 mm

	Straight edges	Length measurements	Comparison with a reference standard	Including compliance with AS 1003 and AS B72	50 mm to 1500 mm
--	----------------	---------------------	--------------------------------------	--	------------------

CAPABILITY

with Calibration and Measurement Capability of -

2 μm from 50 mm to 300 mm

3 μm above 300 to 500 mm

5 μm above 500 to 1000 mm

8 μm above 1000 to 1500 mm

	Extensometers	Length measurements	Comparison with a reference standard	in laboratory and in situ Including compliance to AS 1545	0.01 mm to 250 mm
--	---------------	---------------------	--------------------------------------	--	-------------------



National Association of Testing Authorities, Australia

SCOPE OF ACCREDITATION

CAPABILITY

with Calibration and Measurement Capability of -
 $(0.89 + 0.79L) \mu\text{m}$ where L is the indicated extension in mm

	Vernier calipers	Length measurements	Comparison with a reference standard	Including compliance with AS 1984, BS 887 and JIS 7507	Up to 1.5 m
--	------------------	---------------------	--------------------------------------	--	-------------

CAPABILITY

with Calibration and Measurement Capability of -
 $(10 + 0.025L) \mu\text{m}$ for indication errors where L is the scale value in mm

	Vernier height and depth gauges	Length measurements	Comparison with a reference standard	Including compliance with AS B138	1 mm to 1000 mm
--	---------------------------------	---------------------	--------------------------------------	-----------------------------------	-----------------

CAPABILITY

with Calibration and Measurement Capability of -
Height gauges
 $2.5 \mu\text{m}$ from 10 mm to 300 mm
 $(6 + 0.006L) \mu\text{m}$ from 300 mm to 1000 mm where L is the indicated height in mm
Depth gauges
 $6 \mu\text{m}$ from 1 to 100 mm
 $(5.5 + 0.006L) \mu\text{m}$ above 100 mm to 1000 mm where L is the indicated depth in mm

	Precision spirit levels	Angle (arc)	Comparison with a reference standard	Including compliance with AS 2054	Limited to a sensitivity of 10 seconds of arc
--	-------------------------	-------------	--------------------------------------	-----------------------------------	---

CAPABILITY

with Calibration and Measurement Capability of -
 2 seconds of arc

	Internal micrometers	Length measurements	Comparison with a reference standard	Including compliance with AS 2101	Up to 900 mm
--	----------------------	---------------------	--------------------------------------	-----------------------------------	--------------

CAPABILITY

with Calibration and Measurement Capability of -
 $2.5 \mu\text{m}$ from 25 mm to 150 mm
 $4 \mu\text{m}$ above 150 mm to 300 mm
 $(1.5 + 0.008L) \mu\text{m}$ above 300 mm to 900 mm
 where L is the length in mm

	Surface plates	Flatness	Comparison with a reference standard	Including compliance with AS 1004	Excluding clause 3.4 rigidity
--	----------------	----------	--------------------------------------	-----------------------------------	-------------------------------

CAPABILITY

with Calibration and Measurement Capability of -
 $(3.6 L + 2) \mu\text{m}$ where L is length of longest side of the surface/table

	Eccentric mandrels	Length measurements	Comparison with a		1 to $30 \mu\text{m}$ eccentricity
--	--------------------	---------------------	-------------------	--	------------------------------------



National Association of Testing Authorities, Australia

SCOPE OF ACCREDITATION

			reference standard		
CAPABILITY with Calibration and Measurement Capability of - 0.21 μm from 1 to 10 μm eccentricity 0.43 μm from 10 to 30 μm eccentricity					
	Bevel protractors	Angle (arc)	Comparison with a reference standard	Including compliance with AS B139	150 mm to 300 mm
CAPABILITY with Calibration and Measurement Capability of - 3.6 minutes of arc					
	Feeler gauges	Length measurements	Comparison with a reference standard	Including compliance with 1655	0.04 mm to 1 mm
CAPABILITY with Calibration and Measurement Capability of - (6L + 0.7) μm where L is thickness in mm					
	Steel rulers and measuring tapes	Length measurements	Comparison with a reference standard	Including compliance to AS 1290.4 (only to retractable steel pocket rules)	Steel rules up to 2 m Retractable steel pocket rules up to 10 m
CAPABILITY with Calibration and Measurement Capability of - <u>Steel rules</u> 5.4 μm or (3.5+0.007L) μm (whichever is greater) where L is the length in mm <u>Retractable steel pocket rules</u> 0.47 mm from 0.5 mm to 10 m					
	Squares	Length measurements	Comparison with a reference standard	Including compliance with BS 939	100 mm to 600 mm
CAPABILITY with Calibration and Measurement Capability of - 2 μm from 100 mm to 200 mm 2.6 μm above 200 mm to 450 mm 4.3 μm above 450 mm to 600 mm					
Dimensional metrology - Jigs, fixtures, cutting tools, machine tools, gears, splines and serrations	Components and QC standards; Crimp tools; Cutting tools; Jigs and fixtures;	Length measurements	Comparison with a reference standard by differential measurement		Linear measurements up to 1200 mm



National Association of Testing Authorities, Australia

SCOPE OF ACCREDITATION

CAPABILITY

with Calibration and Measurement Capability of -
(1 + 0.007 L) μm where L is the length in mm

Dimensional metrology - Length and angle standards	Precision graticules; Precision linear scales;	Length measurements; Microscope graticules;	To be determined		Precision graticules with a minimum scale separation of 0.01 mm <u>Precision linear scales</u> up to 500 mm
--	---	--	------------------	--	---

CAPABILITY

with Calibration and Measurement Capability of -
Precision graticules
1.5 μm
Precision linear scales
2 μm

	Dial gauge calibrators; Extensometer calibrators;	Length measurements	Comparison with a reference standard		
--	--	---------------------	--------------------------------------	--	--

CAPABILITY

with Calibration and Measurement Capability of -
(0.4+0.6R) μm where R is the resolution in μm

Dimensional metrology - Limit gauges and reference standards	Plain plug gauges; Plain ring gauges;	Diameter	Comparison with a reference standard		<u>Plain plug gauges</u> up to 250 mm <u>Plain ring gauges</u> 2 mm to 250 mm
--	---------------------------------------	----------	--------------------------------------	--	--

CAPABILITY

with Calibration and Measurement Capability of -
Plain plug gauges
1 μm from 2 mm to 50 mm
3 μm above 50 mm to 250 mm
Plain ring gauges
1 μm from 2 mm to 50 mm
3 μm above 50 mm to 250 mm

	Indicator gauges	Radius	Comparison with a reference standard		
--	------------------	--------	--------------------------------------	--	--

CAPABILITY

with Calibration and Measurement Capability of -
(8+1.1R) μm where R is the radius in mm

Force metrology - Force measuring and testing equipment	Aircraft weighing kits; Hydraulic rams and jacks; Load cells; Load	Force in compression; Force in tension;	Comparison measurement with reference load cell		In tension up to 1000 kN and compression up to 500 kN to class AA including compliance to AS 2193 In tension up to 3.3
---	---	--	---	--	---



National Association of Testing Authorities, Australia

SCOPE OF ACCREDITATION

	measuring rings;				MN and in compression up to 20 MN to class A including compliance to AS 2193
including on site calibrations					
CAPABILITY Including on site calibrations with Calibration and Measurement Capability of - 0.17% reading from 0.01 N to 500 kN in compression 0.17% reading from 0.01 N to 1000 kN in tension 0.25% reading above 500 kN to 20 MN in compression 0.25% reading above 1000 kN to 3.3 MN in tension					
Force metrology - Force measuring and testing equipment	Tension and universal machines in tension	Force in tension	Comparison measurement with reference load cell		Up to 500 kN to class AA and up to 3.3 MN to class A including compliance to AS 2193 and including testing to ISO 7500-1 and ASTM E4
including on site calibrations					
CAPABILITY Including on site calibrations with Calibration and Measurement Capability of - 0.17% reading from 0.01 N to 1000 kN 0.25% reading above 1000 kN to 3.3 MN					
Force metrology - Force measuring and testing equipment	Elastic force measuring devices	Force in compression; Force in tension;	Comparison measurement with reference load cell	Calibration of devices such as load measuring rings for soil testing machines, electronic load cells and hydrostatic weighing units including those in batching plants and aircraft weighing kits including compliance to class AA including compliance to AS 2193 including compliance to class A including compliance to AS 2193	0.01 N to 20 MN in compression 0.01 N to 3.3 MN. in tension in tension up to 1000 kN and compression up to 500 kN to class AA including compliance to AS 2193 in tension up to 3.3 MN and in compression up to 20 MN to class A including compliance to AS 2193



National Association of Testing Authorities, Australia

SCOPE OF ACCREDITATION

including on site calibrations					
<p>CAPABILITY Including on site calibrations with Calibration and Measurement Capability of - 0.17% reading from 0.01 N to 500 kN in compression 0.17% reading from 0.01 N to 1000 kN in tension 0.25% reading above 500 kN to 20 MN in compression 0.25% reading above 1000 kN to 3.3 MN in tension</p>					
Force metrology - Force measuring and testing equipment	Compression and universal machines in compression	Force in compression	Comparison measurement with reference load cell		Up to 500 kN to class AA and up to 20 MN to class A of the requirements of AS 2193 and including testing to ISO 7500-1 and ASTM E4 Verification of compression testing machines for concrete including self-alignment and restraint on tilt tests for compliance with BS 1881 Part 115
including on site calibrations					
<p>CAPABILITY Including on site calibrations with Calibration and Measurement Capability of - 0.17% reading from 0.01 N to 500 kN 0.25% reading above 500 kN to 20 MN</p>					
	Paper product testing equipment	Force in compression; Force in tension;	Comparison measurement with reference load cell	Paper Burst (AS/NZS 1301.403s) Densometer (AS 1301.420s) Board Burst (AS/NZS 1301.438s) Tensile/fracture toughness (AS 1301.448s) Crush testing (AS/NZS 1301.449s) STFI compression strength (AS 1301.450rp) Box compression (AS 1301.800s) Huygen internal bond testers Taber stiffness (AS 1301.431rp)	<u>Huygen internal bond testers</u> 100 J/m ² to 350 J/m ² <u>Taber stiffness</u> 65 Taber units to 1000 Taber units



National Association of Testing Authorities, Australia

SCOPE OF ACCREDITATION

CAPABILITY

with Calibration and Measurement Capability of -
Huygen internal bond testers

1.4 J/m² from 100 J/m² to 350 J/m²

Taber stiffness

1.1% of range from 65 to 1000 Taber units

Force metrology - Force standards	Force calibrating equipment; Force standards and load cells used as force standards;	Force in compression; Force in tension;	Comparison measurement with reference load cell	Including determination of class 0 requirements of AS 2193 and compliance with ISO 379 and ASTM E74	9.8 N to 10 kN
-----------------------------------	--	---	---	---	----------------

CAPABILITY

with Calibration and Measurement Capability of -
 0.03% of reading or 0.14 N (whichever is greater)

Force metrology - Hardness standards and equipment	Brinell hardness machines; Portable Brinell measuring microscopes;	Brinell hardness	Comparison with a reference standard		
including on site calibrations					
	Penetrometers and penetration cones	Penetration resistance	Direct length measurement	AS 1289.6.3.2	
Force metrology - Hardness standards and equipment	Izod impact machines	Izod impact	Comparison with a reference standard; Direct force and length measurement;		2 J to 170 J
including on site calibrations					

CAPABILITY

Including on site calibrations
 with Calibration and Measurement Capability of -
 0.2% reading from 2 J to 170 J

	Rubber bases	Rubber hardness	Comparison with a reference standard		25 IRHD to 97 IRHD
--	--------------	-----------------	--------------------------------------	--	--------------------



National Association of Testing Authorities, Australia

SCOPE OF ACCREDITATION

CAPABILITY

with Calibration and Measurement Capability of -
0.7 IRHD

Force metrology - Hardness standards and equipment	Rubber bases	Rubber hardness	Comparison with a reference standard		
including on site calibrations					
Force metrology - Hardness standards and equipment	Charpy impact machines	Charpy impact	Comparison with a reference standard; Direct force and length measurement;		0.5 J to 600 J
including on site calibrations					

CAPABILITY

Including on site calibrations
with Calibration and Measurement Capability of -
0.2% reading from 0.5 J to 600 J

Force metrology - Hardness standards and equipment	Indenters; Rockwell hardness machines; Rockwell superficial hardness machines;	Rockwell hardness	Comparison with a reference standard		
including on site calibrations					
Force metrology - Hardness standards and equipment	Indenters; Vickers hardness machines; Vickers low-load hardness machines; Vickers micro-hardness machines;	Vickers hardness	Comparison with a reference standard		
including on site calibrations					



National Association of Testing Authorities, Australia

SCOPE OF ACCREDITATION

Force metrology - Hardness standards and equipment	Dead weight micro-hardness rubber testers; Dead weight rubber hardness testers; Rubber hardness meters (durometers);	Rubber hardness	Comparison with a reference standard		From 10 IRHD to 99.5 IRHD
including on site calibrations					
CAPABILITY Including on site calibrations with Calibration and Measurement Capability of - 1% of reading in IRHD from 10 IRHD to 99.5 IRHD					

	Hardness standards	Brinell hardness; Rockwell hardness; Vickers hardness;	Comparison with a reference standard	Hardness of metal products Brinell hardness tests Rockwell hardness tests Vickers hardness tests	Hardness of metal products Brinell hardness tests in the range 9.8 to 29.4 kN Rockwell hardness tests using A, B, C, E, F, G, H, K, N, T scales Vickers hardness tests in the range 9.8 to 980 N
Mass - Determination of mass and calibration of weighing devices	Mass standards	Mass	Gravimetric measurement against reference mass		From 10 mg to 30 kg

CAPABILITY

with Calibration and Measurement Capability of -

- 0.03 mg from 10 mg to 5 g
- 0.04 mg above 5 g to 10 g
- 0.05 mg above 10 g to 20 g
- 0.06 mg above 20 g to 50 g
- 0.15 mg above 50 g to 100 g
- 0.20 mg above 100 g to 200 g
- 3.5 mg above 200 g to 1 kg
- 4 mg above 1 kg to 2 kg
- 10 mg above 2 kg to 5 kg
- 25 mg above 5 kg to 10 kg
- 50 mg above 10 kg to 20 kg
- 130 mg above 20 kg to 30 kg



National Association of Testing Authorities, Australia

SCOPE OF ACCREDITATION

	Industrial weighing devices; Laboratory weighing devices; Precision laboratory balances;	Mass	Gravimetric measurement against reference mass		Up to 4000 kg
<p>CAPABILITY with Calibration and Measurement Capability of - 2 in 10^6 or 20 μg (whichever is greater)) up to 200 g 1 in 10^5 or 1 mg (whichever is greater) above 200 g to 30 kg 5 in 10^5 or 100 mg (whichever is greater) above 30 kg to 4000 kg</p>					
Mass - Determination of mass and calibration of weighing devices	Industrial weighing devices; Laboratory weighing devices; Precision laboratory balances;	Mass	Gravimetric measurement against reference mass		
including on site calibrations					
<p>CAPABILITY Including on site calibrations with Calibration and Measurement Capability of - 2 in 10^6 or 20 μg (whichever is greater)) up to 200 g 1 in 10^5 or 1 mg (whichever is greater) above 200 g to 30 kg 5 in 10^5 or 100 mg (whichever is greater) above 30 kg to 4000 kg</p>					
Pressure metrology - Pressure and vacuum measuring equipment	Pressure control devices; Pressure gauges; Pressure recorders; Pressure transducers; Vacuum gauges;	Gauge pressure	Comparison with dead weight tester; Comparison with reference instrument;	Including test gauges as defined in AS 1349	-100 kPa to 120 MPa
including on site calibrations					
<p>CAPABILITY with Calibration and Measurement Capability of - 0.05% of reading or 0.05 kPa (whichever is greater) from 100 kPa to 120 MPa 0.23% of reading from - 100 kPa to - 20 kPa and 20 kPa to 100 kPa 0.46% of reading or 80 Pa (whichever is greater) from - 20 kPa to 20 kPa</p>					



National Association of Testing Authorities, Australia

SCOPE OF ACCREDITATION

For on site calibrations

with Calibration and Measurement Capability of -

0.23% of reading from -100 kPa to - 20 kPa and 20 kPa to 120 MPa

0.46% of reading or 80 Pa (whichever is greater) from - 20 kPa to 20 kPa

Temperature metrology - Ancillary temperature measuring equipment	Multi-channel thermocouple data recorders	Resistance to temperature conversion; Volt to temperature conversion;	Direct measurement by electrical input		-200°C to 1270°C for electrical simulation
including on site calibrations					

CAPABILITY

Including on site calibrations

with Calibration and Measurement Capability of -

0.1% of full scale reading from -200°C to 1270°C for electrical simulation

Temperature metrology - Humidity measuring equipment	Hygrometers; Relative humidity sensors;	Relative humidity (RH)	To be determined		10% RH to 90% RH
--	---	------------------------	------------------	--	------------------

CAPABILITY

with Calibration and Measurement Capability of -

1.7% RH from 10°C to 19°C and above 23°C to 60°C (in-situ)

1.5% RH above 19°C to 23°C (in-situ)

Temperature metrology - Non-contact temperature measuring equipment	Radiation pyrometers	Temperature	Comparison with a reference standard		IR 7-14 µm pyrometers from 0°C to 450°C
---	----------------------	-------------	--------------------------------------	--	---

CAPABILITY

with Calibration and Measurement Capability of -

1.5°C + 0.8%T when designed for 0.95 emissivity

Temperature metrology - Temperature measuring equipment	Liquid in glass (LIG) thermometers	Temperature	Measurement against reference standard		-30°C to 200°C
---	------------------------------------	-------------	--	--	----------------

CAPABILITY

with Calibration and Measurement Capability of -

1/5 of one scale division or 0.05°C (whichever is the larger) at ice point

0.24°C from -30°C to 100°C

0.3°C above 100°C to 200°C

	Base metal thermocouples	Temperature	Measurement against reference standard		-80°C to 420°C
--	--------------------------	-------------	--	--	----------------



National Association of Testing Authorities, Australia

SCOPE OF ACCREDITATION

CAPABILITY

with Calibration and Measurement Capability of -
 0.5°C + 0.1%T from -80°C to 0°C
 0.5°C above 0°C to 420°C

	Surface probes	Temperature	Measurement against reference standard		25°C to 350°C
--	----------------	-------------	--	--	---------------

CAPABILITY

with Calibration and Measurement Capability of -
 0.5°C + 0.4%T

	Bimetallic systems	Temperature	Measurement against reference standard		0°C to 250°C
--	--------------------	-------------	--	--	--------------

CAPABILITY

with Calibration and Measurement Capability of -
 0.5°C

Temperature metrology - Temperature measuring equipment	Digital temperature measuring systems	Temperature	Measurement against reference standard		-200°C to 1370°C
including on site calibrations					

CAPABILITY

Including on site calibrations
 with Calibration and Measurement Capability of -
 0.2°C from -80°C to 200°C
 0.5°C above 200°C to 420°C
 2°C above 420°C to 1000°C
 0.5°C from 5°C to 80°C for thermohygrometers
 0.3°C from -200°C to 1370°C by electrical simulation (CJC off)
 0.7°C from -200°C to 1370°C by electrical simulation (CJC on)

Temperature metrology - Verification of controlled enclosures	Environmental chambers - Humidity	Humidity	By temperature and humidity measurement		10% RH to 90% RH
---	-----------------------------------	----------	---	--	------------------

CAPABILITY

Including on site calibrations
 with Calibration and Measurement Capability of -
 For range 10% RH to 90% RH
 1.7% RH from 10°C to 19°C and above 23°C to 60°C
 1.5% RH above 19°C to 23°C

Temperature metrology - Verification of	Autoclaves and sterilising ovens; Environmental	Spatial uniformity; Temperature;	Direct temperature measurement		
---	---	----------------------------------	--------------------------------	--	--



National Association of Testing Authorities, Australia

SCOPE OF ACCREDITATION

controlled enclosures	chambers - Temperature; Freezers; Furnaces; Incubators; Ovens;				
including on site calibrations					
CAPABILITY Including on site calibrations with Calibration and Measurement Capability of - <u>Ovens and Furnaces</u> 1.0°C from 0°C to 420°C 2°C from 420°C to 1100°C <u>Incubators</u> 0.5°C from ambient to 100°C <u>Autoclaves and sterilising ovens</u> 1.0°C from ambient to 200°C <u>Industrial freezers</u> 1.0°C from -80 to 0°C <u>Environmental Chambers (Temperature)</u> 0.6°C from -80 to 200°C					
Temperature metrology - Verification of controlled enclosures	Ovens	Fluctuation	Direct temperature measurement	Efficiency of drying ovens including compliance to AS 1289.0 clause 4.2.3 Rate of loading of drying ovens including compliance to AS 1289.0 clause 4.2.4	
including on site calibrations					
CAPABILITY Including on site calibrations with Calibration and Measurement Capability of - 0.5 g/h					
Time and frequency metrology - Frequency, time and waveform measuring equipment	Frequency meters	Frequency	Measurement against reference standard		30 Hz to 2 MHz
CAPABILITY with Calibration and Measurement Capability of - 5 µHz + 0.006% reading					
	Tachometers	Rotational speed	Comparison with a		0.1 rpm to 100000 rpm



National Association of Testing Authorities, Australia

SCOPE OF ACCREDITATION

			reference standard		including mechanical attachment and strobe functionality tests
CAPABILITY with Calibration and Measurement Capability of - 0.1 rpm from 100 to 1000 rpm 0.3 rpm above 1000 to 10000 rpm 3 rpm above 10000 to 100000 rpm					
	Time interval meters	Time interval	Measurement against reference standard		10 ms to 1000 ms including trip time for RCD/ELCB testers
CAPABILITY with Calibration and Measurement Capability of - 1.2 ms					
Torque - Torque measuring and testing equipment	Torque transducers; Torque wrenches;	Torque	Comparison with a reference standard	Including compliance to AS 4115	0.1 Nm to 1500 Nm
including on site calibrations					
CAPABILITY with Calibration and Measurement Capability of - <u>Torque wrenches (including on site calibrations)</u> 0.5% of reading up to 1500 Nm <u>Torque transducers</u> 0.04% of reading up to 100 Nm 0.1% of reading above 100 Nm to 1500 Nm					

| Accreditation Number: 1239 | Site Number: 1232 | Printed on : 30-Dec-2019

----- END OF SCOPE -----