



Australian Government
Department of Industry,
Science and Resources

**National
Measurement
Institute**

**Appointment as a Verifying Authority
for
Reference Standards of Measurement and Physical Quantities of
Artefacts**

In accordance with Regulation 73 of *National Measurement Regulations 1999* (Cth), in force under the *National Measurement Act 1960* (Cth), the Chief Metrologist hereby appoints:

**Keysight Technologies Australia Pty Ltd
(ABN 25 167 128 878)**

Operating at:
**745 Springvale Road
Mulgrave VIC 3170**

to be a Verifying Authority for the verification of reference standards of measurement under regulation 13 and the verification of physical quantity of artefacts under Regulation 34C of the *National Measurement Regulations 1999* (Cth) for the physical quantity of:

Length, Mass, Volume, Density, Flow, Temperature, Frequency

This appointment is for the period from 17 December 2024 to 21 December 2026 and is limited to the range specified in the attached schedule, and the use of procedures approved by the Chief Metrologist.

Dated this Seventeenth day of December 2024

Signed

James Cantrill
For Dr Richard Bruce Warrington
Chief Metrologist
National Measurement Institute

Certificate: NMI2023.01-024-KEYSIGHT-VARSM+A Form No. NMI/VARSM+A/2023 Page 1 of 6

Schedule to Appointment as a Verifying Authority for Reference Standards of Measurement and Artefacts

**Keysight Technologies Australia Pty Ltd
(ABN 25 167 128 878)**

Operating at:
**745 Springvale Road
Mulgrave VIC 3170**

| Physical Quantity | Range of Standard(s) and Artefact(s) | Least Uncertainty |
|--------------------------|---|---|
| Length | | |
| Measuring tapes | up to 15 m | 0.40 mm |
| | above 15 m up to 30 m | 0.65 mm |
| | above 30 m up to 50 m | 0.32 + 0.018L mm |
| | above 50 m up to 100 m | 0.23 + 0.022L mm (where L is in metres for length) |
| Mass | | |
| Mass Standards | from 1 mg to 1 g | 6 µg |
| | at 2 g | 8 µg |
| | at 5 g | 20 µg |
| | at 10 g | 30 µg |
| | at 20 g | 40 µg |
| | at 50 g | 0.1 mg |
| | at 100 g | 0.2 mg |
| | at 200 g | 0.3 mg |
| | at 500 g | 0.5 mg |
| | at 1 kg | 1.0 mg |
| | at 2 kg | 4 mg |
| | at 5 kg | 7 mg |
| | at 10 kg | 10 mg |
| | at 20 kg | 20 mg |
| | at 25 kg | 500 mg |
| | from 50 kg to 100 kg | 3 g |
| | at 250 kg | 7 g |
| | at 500 kg | 22 g |
| | at 1 000 kg | 50 g |

James Cantrill
For Dr Richard Bruce Warrington
Chief Metrologist
National Measurement Institute

Certificate: NMI2023.01-024-KEYSIGHT-VARSM+A Form No. NMI/VARSM+A/2023 Page 2 of 6

| Physical Quantity | Range of Standard(s) and Artefact(s) | Least Uncertainty |
|--|--|---|
| Determination of mass | up to 25 t | 5 in 10 ⁴ |
| Volume | | |
| Volumetric glassware | at 200 µL | 0.3 µL |
| | at 2 mL | 1.1 µL |
| | at 20 mL | 6 µL |
| | at 200 mL | 22 µL |
| | at 500 mL | 97 µL |
| Industrial volumetric proving measures | up to 2 000 L (using volumetric methods) | 0.02% |
| | 10 000 L (using gravimetric methods) | 0.008% |
| Standard measures | up to 500 L (volume standard) | 0.01% |
| | up to 25 L (inspection standards) | 0.02% |
| Density | | |
| Density of liquids | from 995 kg/m ³ to 1000 kg/m ³ | 0.06 kg/m ³ |
| Flow rate | | |
| Liquid (water) meters - including on-site calibrations | from 0.2 L/min up to 0.8 L/min | 3.5% of reading |
| | above 0.8 L/min to 1 L/min | 0.75% of reading |
| | above 1 L/min to 20 L/min | 0.4% of reading |
| | above 20 L/min to 400 L/min | 0.07% of reading (min. test volume of 400 mL) |
| Temperature | | |
| Base metal thermocouples | from -55 °C to 180 °C | 0.1 °C |
| Metallic resistance thermometers | from -55 °C to 300 °C | 0.05 °C |
| Surface probes | from 0 °C to 20 °C | 0.7 °C |
| | above 20 °C to 300 °C | 1.2 °C |

James Cantrill
For Dr Richard Bruce Warrington
Chief Metrologist
National Measurement Institute

Certificate: NMI2023.01-024-KEYSIGHT-VARSM+A Form No. NMI/VARSM+A/2023 Page 3 of 6

| Physical Quantity | Range of Standard(s) and Artefact(s) | Least Uncertainty |
|------------------------------|--------------------------------------|-----------------------------|
| Liquid-in-glass thermometers | from -55 °C to 0 °C | 0.1 °C |
| | at 0 °C | 0.01 °C |
| | above 0 °C to 180 °C | 0.05 °C |
| | from 180 °C to 300 °C | 0.2 °C |
| Vapour pressure thermometers | from -55 °C to 20 °C | 0.2 °C |
| | above 20 °C to 180 °C | 1 °C |
| Filled metal systems | from -55 °C to 20 °C | 0.2 °C |
| | above 20 °C to 180 °C | 1 °C |
| Bimetallic systems | from -55 °C to 20 °C | 0.2 °C |
| | above 20 °C to 180 °C | 1 °C |
| Frequency | from 1 mHz to 12.4 GHz | 5 parts in 10 ¹² |
| | from 12.4 GHz to 46 GHz | 2 parts in 10 ¹⁰ |
| | from 46 GHz to 50 GHz | 8 parts in 10 ⁸ |

Signatories

The following persons are the permitted signatories under this appointment:

| Name | Physical Quantity | Range |
|-----------------|-------------------------------------|-----------------------------------|
| Ian Tovey | Length, Mass, Volume, Flow | as per the scope of this schedule |
| Gwenda Rowsell | Length, Mass, Volume, Flow, Density | as per the scope of this schedule |
| Richard Amstutz | Temperature | as per the scope of this schedule |
| George Moutsios | Frequency | as per the scope of this schedule |

James Cantrill
For Dr Richard Bruce Warrington
Chief Metrologist
National Measurement Institute

Certificate: NMI2023.01-024-KEYSIGHT-VARSM+A Form No. NMI/VARSM+A/2023 Page 4 of 6

Statutory Conditions

This appointment as a verifying authority for reference standards of measurement under regulation 73 of the *National Measurement Regulations 1999* (Cth) is subject to the conditions stated in regulation 77 of the *National Measurement Regulations 1999* (Cth) as amended. At the time of appointment regulation 77 contains the following conditions

- (a) That the authority participate in training, related to the performance of the duties of an authority, required by the Chief Metrologist;
- (b) That the authority report, as required by the Chief Metrologist, about its performance of its duties;
- (c) That the authority, and any responsible agent or employee of the authority, comply with the *National Measurement Act 1960* (Cth) and the *National Measurement Regulations 1999* (Cth) and any condition stated in the instrument of appointment.
- (d) That the authority comply with any determinations applying to the authority under regulation 20 of the *National Measurement Regulations 1999* (Cth).

Additional Conditions

In addition to the statutory conditions of appointment of authorities contained in regulation 77 of the *National Measurement Regulations 1999* (Cth) this appointment is also subject to the following conditions:

- (i) Continuing accreditation against AS ISO/IEC 17025 *General requirements for the competence of testing and calibration laboratories* in the form of NATA accreditation No. 99
- (ii) The authority shall not engage a responsible agent or arrange for any standard of measurement to be verified by an agent or anyone under its supervision without obtaining the prior consent of the Chief Metrologist in writing;
- (iii) Discharge of all financial obligations to the National Measurement Institute in respect of this appointment;
- (iv) Compliance with the formatting and/or any other requirements of the Chief Metrologist and/or the National Measurement Institute with respect to certificates of verification of reference standards of measurement;

James Cantrill
For Dr Richard Bruce Warrington
Chief Metrologist
National Measurement Institute

- (v) This appointment revokes and replaces any previous appointments and/or any extensions granted to any previous appointments.

Notes:

This is an amended appointment due to the addition of a new permitted signatory, George Moutsios, and the removal of permitted signatory, Les Thomaidis.

James Cantrill
For Dr Richard Bruce Warrington
Chief Metrologist
National Measurement Institute

Certificate: NMI2023.01-024-KEYSIGHT-VARSM+A Form No. NMI/VARSM+A/2023 Page 6 of 6