Australian Government
Department of Industry, Science, Energy and Resources

National Measurement Institute

36 Bradfield Road, West Lindfield NSW 2070

General Certificate of Approval

NMI 4/12/0

Issued by the Chief Metrologist under Regulation 60
of the
National Measurement Regulations 1999

This is to certify that an approval for use for trade has been granted in respect of:

Bottom draining alcoholic beverage measures.

NOTE: This Certificate relates to the suitability of the pattern of the instrument for use for trade only in respect of its metrological characteristics. This Certificate does not constitute or imply any guarantee of compliance by the manufacturer or any other person with any requirements regarding safety.

This approval is subject to review at the decision of the Chief Metrologist in accordance with the conditions specified in the document NMI P 106.

DOCUMENT HISTORY

Rev	Reason/Details	Date
0	Pattern Approved – Certificate issued	18/03/22

CONDITIONS OF APPROVAL

General

Instruments purporting to comply with this Certificate of Approval shall be marked NMI 4/12/0 in addition to other required markings (see clause 1.2 – Markings).

It is the manufacturer's responsibility to ensure that all instruments purporting to comply with this approval are constructed as described in this Certificate of Approval and Technical Schedule. Failure to comply with this Condition may attract penalties under Section 19B of the *National Measurement Act 1960*.

The National Measurement Institute reserves the right to examine any instrument or component of an instrument purporting to comply with this approval.

Signed by a person authorised by the Chief Metrologist to exercise their powers under Regulation 60 of the *National Measurement Regulations 1999*.

Darryl Hines
Manager
Policy and Regulatory Services

TECHNICAL SCHEDULE No 4/12/0

1. Description of Pattern

Bottom draining measures used to measure alcoholic beverages.

1.1 Construction

1.1.1 Materials

The measure shall be made of rigid or semi-rigid material. The body of the measure shall be transparent or translucent.

1.1.2 Design

The measure shall stand firmly on its base and shall remain stable, and not overturn, when tilted to an angle of 15° from the vertical, whether it is completely filled, partly filled or empty.

The measure shall be fitted with a drainage device (e.g. a tap or valve) at the bottom of the measure.

The measure shall be of such design and construction that it does not leak.

The measure shall be capable of delivering the stated nominal quantity or quantities within the maximum permissible error when emptied from the drainage device.

The measure shall deliver the stated nominal quantity or quantities from the drainage device within the maximum permissible error when inclined up to 2° from the horizontal in any orientation.

The measure may be provided with a stopper to prevent product loss from the top of the measure. A stopper may include a cooling tube designed only to be submerged in the liquid after the measure has been filled to the nominal capacity. A stopper is not considered part of the measure and shall not determine the capacity.

1.1.3 Capacity Definition

Every measure shall be a line measure. The capacity is the greatest volume quantity marked on the measure, which is the volume of liquid the measure is deemed to deliver from the drainage device when filled to the prescribed level with liquid at a temperature of 20 °C.

The measure may be marked with more than one denomination line.

The capacity of the measure and other quantities shall be defined by a denominated line. The measure shall be clearly and permanently marked with a horizontal line which is not less than 15 mm long and which is not more than

3 mm nor less than 1 mm wide.

1.1.4 Verification Provision

Provision is made for the application of a verification mark on the body of the measure.

1.2 Markings

Measures purporting to comply with this approval shall be marked with the following data:

Manufacturer's name or mark

Capacity or capacities

Certificate of Approval No. '**NMI 4/12/0**'

Measures shall also be marked with the statement "**This measure shall only be used when level**".

Stoppers shall be marked with the statement "**This stopper does not form part of the measurement**".

Stoppers in the form of cooling tubes shall be marked with the statement "**This cooling tube does not form part of the measurement**".

The above markings shall be in a position clearly visible when the measure is standing on its base.

Every quantity shall be clearly and permanently marked or moulded on the side of the measure adjacent to the corresponding denomination line, including the unit or its symbol.

The quantity and its unit (or symbol) shall be in the same alignment.

In a statement of quantity, all numbers and uppercase letters shall be at least 5 mm high; all lower case letters shall be at least 3 mm high.

Unit symbols are placed after the complete numerical value, leaving a space between the numerical value and the unit symbol.

The preferred units (and their symbols) are millilitres (mL) and litres (L). Other acceptable units are centilitres (cL) and decilitres (dL).

Any lines or decorative markings shall be positioned so that they cannot be confused with the quantity line/s (where applicable) or the mandatory markings.

TEST PROCEDURES No 4/12/0

Measures purporting to comply with this approval shall be individually tested and verified. Measures purporting to comply with the approval shall not be batch tested.

Measures shall be visually inspected to ensure compliance with this certificate.

All marked quantities shall be tested for accuracy for the purposes of verification.

The maximum permissible errors for portable measures for potable liquids are specified in Schedule 1 of the *National Trade Measurement Regulations 2009.*

Equipment

1. Appropriate reference standards of measurement:
   (a) for *volumetric* method:
      (i) volume measure calibrated to (a known volume of water); and
      (ii) burette or pipette (to measure a known volume of water);
   (b) for *gravimetric* method:
      (i) reference weight(s) (suitable to test the control instrument as required).
2. Current Regulation 13 certificates for all reference standards of measurement.

   All reference standards of measurement shall comply with the uncertainties and variations permitted in the *National Measurement Regulations 1999* (Cth). The combined uncertainties and variations shall be no greater than one-third of the applicable MPE of the measures or control instrument being tested.
3. Supply of distilled or potable (town) water.
4. Suitable weighing instrument (referred to as a control instrument) for determining the mass of the delivered volume (for *gravimetric* method). See below for suitability requirements for the control instrument.

A control instrument is used to determine the mass of measured volume of the liquid in the *gravimetric* method detailed below.

Suitability of Control Instrument

The control instrument shall:
- be a non-automatic weighing instrument;
- have a scale interval equal to or better than 0.1 g;
- be capable of having standard weights deposited on the load receptor; and
- have a maximum capacity suitable for the measurements required.

Testing the Control Instrument

1. Place the control instrument in a suitable area with ample background light and at a convenient height.

2. Test the control instrument in accordance with *NITP 6.1 to 6.4 National Instrument Test Procedures for Non-automatic Weighing Instruments* for the following tests:
   (a) repeatability;
   (b) eccentricity; and
   (c) weighing performance (up to at least 110% of the capacity used for testing)
3. The instrument shall not have an error (MPD and MPE) greater than 0.5 *e*. The instrument should be tested immediately before commencing any testing of the measure.

Performance Testing the Control Instrument

A weighing performance test is repeated regularly, at least every hour during measurements to ensure the on-going accuracy of the instrument. The instrument shall not have an error greater than 0.5 *e*. If the instrument has a greater error, the instrument shall be calibrated.

Where the accuracy of the control instrument has been observed to deviate, calibration testing shall occur more regularly and if the problem continues, an alternate instrument shall be used.

Accuracy

Accuracy shall be tested using either the *volumetric* method or the *gravimetric* method described below to test the measure for accuracy.

Ensure both the volume measure and liquid used for testing are between 10 °C and 30 °C when completing the test procedures described.

The measure shall deliver the stated quantities of product within the maximum permissible error when filled on a level surface and drained in a position up to 2° out of level in any direction. Additional accuracy tests shall be completed as necessary and dependent on the measure's design (particularly with respect to the design of the base and drainage device).

Volumetric Method

1. Place the measure under test on a stable and level surface with the capacity line at eye level.

Note: The measurement of capacity is when the bottom of the meniscus coincides with the top of the marked line.

2. Fill the measure with water to the capacity line under test.
3. Condition the reference standard volume measure as per the Reg. 13 certificate.
4. From the drainage device, empty the water contained in the measure into the reference standard volume measure, continuing to operate the drainage device to allow the measure to drain for 30 seconds from when the constant flow changes to drops.

5. Determine if the volume of water delivered from the measure is within the MPE.

Repeat steps 2-7 above with the measure in a position (or various positions as necessary) up to 2° out of level and determine if the results are within the MPE.

Gravimetric Method

1. Test the control instrument as detailed above.
2. Place the measure on a level surface (the control instrument may be used) and fill the measure with water to the capacity line under test and record the mass of the filled measure determined on the control instrument (m_1) to an accuracy of 0.1 g or better.

Note: The measurement of capacity is when the bottom of the meniscus coincides with the top of the marked line.

3. Using the drainage device, empty the water contained in the measure continuing to operate the drainage device to allow the measure to drain for 30 seconds from when the constant flow changes to drops.
4. Determine and record the tare mass of the measure under test (m_2) to an accuracy of 0.1 g or better by placing the measure on the load receptor of the control instrument.
5. Calculate the mass/volume of the water delivered from the measure ($m_1 - m_2$).

Note: Volume = mass divided by density. The density of town water between 10 °C and 30 °C is taken to be 1 g/mL

6. Determine if the volume of water drained from the measure is within the MPE.

Repeat steps 2-6 above, draining the measure in a position (or various positions as necessary) up to 2° out of level and determine if the results are within the MPE.