



WMTS-530:2020

Water meters with integral shut off valve

WaterMark Technical Specification

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PREFACE

This WaterMark Technical Specification (WMTS) was prepared in accordance with the Manual for the WaterMark Certification Scheme, Appendix 4, Protocol for Developing Product Specifications.

The objective of this WaterMark Technical Specification is to enable product certification in accordance with the requirements of the Plumbing Code of Australia (PCA).

The word 'VOID' set against a clause indicates that the clause is not used in this WaterMark Technical Specification. The inclusion of this word allows a common use clause numbering system for the WaterMark Technical Specifications.

The term 'normative' has been used in this WaterMark Technical Specification to define the application of the appendices to which they apply. A 'normative' appendix is an integral part of a WaterMark Technical Specification.

The test protocol and information in this WaterMark Technical Specification was arranged to meet the authorisation requirements given in the PCA.

The WaterMark Schedule of Products and the WaterMark Schedule of Excluded Products are dynamic lists and change on a regular basis. Based on this function, these schedules are now located on the ABCB website (www.abcb.gov.au). These lists will be version controlled with appropriate historic references.



ACKNOWLEDGEMENTS

WaterMark Technical Specification WMTS-530:2020 was prepared by industry and was approved by the Administering Body on **XX XX 2020**.

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1 SCOPE

This Technical Specification sets out requirements for water meters with integral shut off valve for installation into existing property service valves. The meters may be installed in cold or hot water service pipelines.

2 APPLICATION

The meters covered by this Technical Specification are intended to be used for the measurement of the actual volume of drinking water flowing through a property service pipe. The meters are for installation at a location within the plumbing system that does not require integral backflow prevention with the water meter housing.

Appendix A sets out the means by which compliance with this WaterMark Technical Specification shall be demonstrated by a manufacturer for the purpose of product certification.

3 REFERENCED DOCUMENTS

The following documents are referred to in this Technical Specification:

AS

1432	Copper tubes for plumbing, gas fitting and drainage applications
1565	Copper and copper alloys—Ingots and castings
1572	Copper and copper alloys - Seamless tubes for engineering purposes
2345	Dezincification resistance of copper alloys
2738	Copper and copper alloys—Compositions and designations of refinery products, wrought products, ingots and castings
3565.1	Meters for cold and heated drinking and non-drinking water supplies Part 1: Technical requirements

AS/NZS

1567	Copper and copper alloys—Wrought rods, bars and sections
3718	Water supply – Tap ware
3500.0	Plumbing and drainage, Part 0: Glossary of terms
3500.1	Plumbing and drainage, Part 1: Water services
3500.2	Plumbing and drainage, Part 2: Sanitary plumbing and drainage
3500.4	Plumbing and drainage, Part 4: Heated water services
4020	Testing of products for use in contact with drinking water

ASTM	
A269	Standard specification for seamless and welded austenitic stainless steel tubing for general service
A276	Standard specification for stainless steel bars and shapes
ISO	
6957	Copper alloys — Ammonia test for stress corrosion resistance
NMI	
R 49-1	Water meters for cold potable water and hot water
NCC	
PCA	Plumbing Code of Australia

4 DEFINITIONS

For the purpose of this WaterMark Technical Specification, the definitions given in the WaterMark Scheme Rules, PCA, AS/NZS 3500.0 and those below apply.

4.1 Manifold

The fitting components housing the meter and providing for connection to the water service pipe.

5 MATERIALS

5.1 General

This clause specifies requirements for materials used in the manufacture of the product.

5.2 Metallic materials

5.2.1 General

Metallic materials in contact with water shall be corrosion resistant. For the purposes of this Technical Specification, the following materials are considered to be suitable:

- a) Copper, as specified in Clause 5.2.2.
- b) Copper alloy, as specified in Clause 5.2.3 and 5.2.4.

5.2.2 Copper

Copper shall comply with the following:

- c) Wrought products - AS 2738.
- d) Tubular components - AS 1432.

5.2.3 Copper alloy

Copper alloy shall comply with the following:

- e) Castings - AS 1565, or capable of passing the requirements of Clause 5.2.4 provided the alloy contains not less than 58% copper and not more than 1% aluminium.
- f) Rod for machined parts - AS/NZS 1567, or an alloy complying with AS 2345.
- g) Tubular components - Copper alloy tube shall comply with AS 1572 alloy designation C26130. Where bent or stamped in the fabrication process, the tube shall be sufficiently stress-relieved so that it is capable of passing the stress corrosion test of ISO 6957 Clause 8, using a test solution of pH 9.5 without prior pickling, after all fabrication processes are complete.

5.2.4 Dezincification-resistance (DR) copper alloy

Copper alloys in contact with water shall comply with AS 2345.

5.2.5 Stainless steel

Stainless steel in contact with water shall comply with ASTM A276 for wrought components or ASTM A269 for tubular components, grades 316, 316L, 316Ti, UNS S31803 (2205) or equivalent.

Stainless steel not in contact with water shall comply with ASTM A276 for wrought components or ASTM A269 for tubular components, grades 304, 304L, 304LN, 316, 316L, 316Ti, UNS S31803 (2205) or equivalent.

5.3 Other materials

All other materials used in the manufacture of the product shall comply with the material requirements of AS 3565.1.

6 MARKING

Products or packaging shall be marked in accordance with the Manual for the WaterMark Certification Scheme.

In addition, products shall be permanently and legibly marked with any additional markings as required by the NMI R-49-1 (excluding direction of flow).

7 PACKAGING

The product shall be supplied with suitable packaging to prevent damage during transportation.

8 DESIGN

8.1 Metrological approval

The integral water meter shall comply with NMI R-49-1 and shall be pattern approved where applicable under the National Measurement Act 1960.

8.2 End connection

The end connection of the manifold housing the meter shall comply with AS/NZS 3718.

8.3 Operating mechanism and shut-off device

The operating mechanism shut off design may be the manufacturer's own design.

8.4 Finish and workmanship

The surface finish of tap components shall comply with AS/NZS 3718.

9 PERFORMANCE CRITERIA AND TEST METHODS

9.1 Materials in contact with drinking water

Materials in contact with drinking water shall comply with AS/NZS 4020. The product shall be tested as inline for scaling factor purposes.

9.2 Hydraulic strength

When tested in accordance with the hydraulic strength test of AS/NZS 3718, the meter assembly shall not leak.

9.3 Watertightness

When tested in accordance with the watertightness under pressure test of AS/NZS 3718, with the outflow chambers of the manifold blocked, the meter assembly shall not leak.

9.4 Endurance of shut off device

When tested in accordance with the endurance test of AS/NZS 3718 for 10,000 cycles, the operating mechanism shall not leak.

9.5 Torque of operating mechanism

The tap operating mechanism, including the handle in the closed position, shall not leak, crack or break when a torque of 5 N/m is applied in the closing direction.

10 TEST SEQUENCE AND TEST SAMPLE PLAN

Void

11 PRODUCT DOCUMENTATION

11.1 Product data

Product data, that identifies critical product characteristics such as the following, shall be available:

- a) Water supply temperature and pressure limitations.
- b) Pressure loss class.
- c) Product orientation.
- d) Compatible tap headworks.

11.2 Installation instructions

Instructions shall be provided that give full details of installation procedures for the water meters with integral shut off valve including the following:

- a) Reference to installation in accordance with the PCA, including the installation of any non-integral backflow prevention device, means of expansion control and any limitations on the product.

Note: A material or product that is listed on the WaterMark Product Database and is marked in accordance with the WaterMark Certification Scheme is recognised by authorities having jurisdiction as being authorised for use in a plumbing or drainage installation. This is because the material or product complies with the applicable product specification. The installation of an authorised material or product must meet the requirements of the PCA. Where the PCA does not contain installation requirements applicable to the authorised material or product, acceptance of the installation is at the discretion of the authority having jurisdiction.

- b) Step-by-step installation instructions.
- c) Commissioning procedures and adjustments required.
- d) Troubleshooting guide.
- e) Contact details for after-sales service.

APPENDIX A MEANS FOR DEMONSTRATING COMPLIANCE WITH THIS PRODUCT SPECIFICATION

(Normative)

A.1 SCOPE

This appendix sets out the means by which compliance with this WaterMark Technical Specification shall be demonstrated by a manufacturer under the WaterMark Certification Scheme.

A.2 RELEVANCE

The long-term performance of plumbing systems is critical to the durability of building infrastructure, protection of public health and safety, and protection of the environment.

A.3 PRODUCT CERTIFICATION

The purpose of product certification is to provide independent assurance of the claim by the manufacturer that products comply with this WaterMark Technical Specification.

The WaterMark Certification Scheme serves to indicate that the products consistently conform to the requirements of this WaterMark Technical Specification.

The sampling and testing plan, as detailed in Paragraph A5 and Table A1, shall be used by the WaterMark Conformity Assessment Body. Where a batch release testing program is required, it shall be carried out by the manufacturer as detailed in Paragraph A5 and Table A2.

A.4 DEFINITIONS

A.4.1 Batch release test

A test performed by the manufacturer on a batch of components, which has to be satisfactorily completed before the batch can be released.

A.4.2 Production batch

A clearly identifiable collection of units, manufactured consecutively or continuously under the same conditions, using material or compound to the same specification.

A.4.3 Sample

One or more units of product drawn from a batch, selected at random without regard to quality.

NOTE: The number of units of product in the sample is the sample size.

A.4.4 Sampling plan

A specific plan that indicates the number of units of components or assemblies to be inspected.

A.4.5 Type test batch

Schedule of units of the same type, identical dimensional characteristics including the nominal diameter and wall thickness, and from the same compound. The batch is defined by the manufacturer.

A.4.6 Type testing (TT)

Testing performed to demonstrate that the material, component, joint or assembly is capable of conforming to the requirements given in the WaterMark Technical Specification.

A.5 TESTING**A.5.1 Type testing**

Table A1 sets out the requirements for type testing and frequency of re-verification.

A.5.2 Batch release testing

Table A2 sets out the minimum sampling and testing frequency plan for a manufacturer to demonstrate compliance of product(s) to this WaterMark Technical Specification on an ongoing basis. However, where the manufacturer can demonstrate adequate process control to the WaterMark Conformity Assessment Body, the frequency of the sampling and testing nominated by the manufacturer's quality plan and/or documented procedures shall take precedence for the purposes of WaterMark product certification.

A.5.3 Retesting

In the event of a batch release test failure, the products within the batch may be retested at a frequency agreed to with the WaterMark Conformity Assessment Body and only those batches found to comply may be claimed and/or marked as complying with this WaterMark Technical Specification.

A.5.4 Minimum annual inspection requirements

Table A3 sets out the minimum annual inspection requirements to be undertaken.

A.5.5 Re-evaluation testing

Table A4 sets out the requirements for re-evaluation testing.

TABLE A1
TYPE TESTS

Characteristic	Clause	Requirement	Test method	Frequency
Materials	5	Materials	Review materials parts lists and compliance certificates	At any change in material specification
	5.2.4	Dezincification-resistance	AS 2345	At any change of design
Marking	6	Marking	Design review	At any change of design
Design	8.1	Metrological approval	NMI R 49-1	At any change of design
	8.2	End connection	AS/NZS 3718	
	8.3	Operating mechanism	Design review	
	8.4	Finish and workmanship	Design review	
Performance	9.1	Products in contact with water	AS/NZS 4020	At any change in materials, formulation or design
	9.2	Hydraulic strength	AS/NZS 3718	At any change of design
	9.3	Watertightness	AS/NZS 3718	
	9.4	Endurance test	AS/NZS 3718	
	9.5	Torque of operating mechanism	Clause 9.5	
Product documentation	11	Product data/Installation and maintenance instructions	Product documentation	At any change to installation requirements

**TABLE A2
BATCH RELEASE TESTS**

Characteristic	Clause	Requirement	Test method	Frequency
Materials	5	Composition, temper, etc.	Review materials parts lists and compliance certificates	Once per batch
Marking	6	Marking	Visual examination	100%
Design	8.2	End connection	Dimensional verification	Once per batch
Performance	9.3	Watertightness	AS/NZS 3718	Once per batch
Product documentation	11	Installation instructions	Visual examination	100%

**TABLE A3
MINIMUM ANNUAL INSPECTION REQUIREMENTS BY WMCAB**

Characteristic	Clause	Requirement	Test method
Materials	5	Composition, temper, etc.	Review materials parts lists and compliance certificates
Marking	6	Marking	Visual examination
Design	8.2	End connection	Verification
Performance	9.3	Watertightness	AS/NZS 3718
Product documentation	11	Installation Instructions	Visual examination

TABLE A4
RE-EVALUATION TESTING

Characteristic	Clause	Requirement	Test method
Materials	5	Composition, temper, etc.	Review materials parts lists and compliance certificates
Marking	6	Marking	Visual examination
Design	8.1	Metrological approval	Validate
	8.2	End connection	Dimensional verification
Performance	9.2	Hydraulic strength	AS/NZS 3718
	9.3	Watertightness	AS/NZS 3718
Product documentation	11	Installation instructions	Visual examination