



WMTS-012:2018 In-line valves

for use in plumbing water supply
systems- Miscellaneous types metallic
and non-metallic

WaterMark Technical Specification

2018





WMTS-012:2018

**In-line valves for use in plumbing water supply systems—
Miscellaneous types metallic and non-metallic**

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Document formerly known as:-

ATS 5200.012 – 2005 Technical Specification for Plumbing and Drainage Products
Part 012: In-line valves for use in plumbing water supply systems—
Miscellaneous types metallic and non-metallic

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2018

IMPORTANT NOTICE AND DISCLAIMER

On 25 February 2013 management and administration of the WaterMark Certification Scheme transferred to the Australian Building Codes Board (ABCB). From this date all new technical specifications will be named WaterMark Technical Specifications (WMTS). Within two years all existing ATS will be renamed WMTS. During this initial period both terms may be used and accepted. All new and recertified Certificates of Conformity will reference WMTS. Certificates of Conformity that currently reference ATS will be re-issued referencing the equivalent WMTS during this initial period. The WaterMark Schedule of Specifications lists all current WMTS and, where appropriate, the former ATS name.

This Technical Specification supersedes Standards Australia ATS 5200.012 – 2005.

The rebranding of this Technical Specification has included additional information about the transition as well as changes to specific details including replacing references to Standards Australia and the National Plumbing Regulators Forum (NPRF) with the ABCB, changing the term Australian Technical Specification (ATS) to WaterMark Technical Specification (WMTS), replacing references to technical committees WS-014 and WS-031 with the WaterMark Technical Advisory Committee (WMTAC).

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PREFACE

WaterMark Technical Specification WMTS-012:2016 Technical Specification for plumbing and drainage products, In-line valves for use in plumbing water supply systems—Miscellaneous types metallic and non-metallic was originally prepared by the Joint Standards Australia/Standards New Zealand Committee WS-031, Technical Procedures for Plumbing and Drainage Products Certification as ATS 5200.012-2005.

WaterMark Technical Specification WMTS-012:2018 Technical Specification for plumbing and drainage products, In-line valves for use in plumbing water supply systems – miscellaneous types metallic and non-metallic, incorporates the following amendments:-

- i. Clarification and revision of materials to be used within in-line valves.
- ii. Clause 9.1, AS/NZS 4020 scaling factor

The objective of this 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 Technical Specification. The inclusion of this word allows a common use clause numbering system for the plumbing and drainage Watermark Technical Specifications.

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

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

The WaterMark Schedule of Specifications and List of Exempt Products are dynamic lists and change on a regular basis. Based on this function, these lists have been removed from the WaterMark Certification Scheme document known as Technical Specification for Plumbing and Drainage Products and are now located on the ABCB website (www.abcb.gov.au). These lists will be version controlled with appropriate historic references.

ACKNOWLEDGEMENTS

Australian Technical Specification AS5200.012:2005, on which this technical specification is based, was prepared by Standards Australia Committee WS-031, Technical Procedures for Plumbing and Drainage Products Certification. It was approved on behalf of the Council of Standards Australia on 10 March 2005.

The following organisations were represented on Committee WS-031 in the preparation of Australian Technical Specification ATS 5200.012-2005:

- AUSTAP
- Australian Electrical and Electronic Manufacturers Association
- Australian Industry Group
- Certification Interests (Australia)
- Consumer Electronics Suppliers Association
- Copper Development Centre—Australia
- Gas Appliances and Services Association
- Master Plumbers and Mechanical Services Association of Australia
- Master Plumbers Australia
- Master Plumbers, Gasfitters and Drainlayers New Zealand
- National Fire Industry Association
- New Zealand Water & Waste Association
- Plastics Industry Pipe Association of Australia
- Plumbing Industry Commission
- South Australian Water Corporation
- Water Services Association of Australia

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1 SCOPE

This Technical Specification sets out requirements for miscellaneous type metallic and plastic bodied in-line valves for use in plumbing water supply systems, such as ball, butterfly, diaphragm, globe and plug.

2 APPLICATION

Appendix A sets out the means by which compliance with this 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, gasfitting and drainage applications
- 1565 Copper and copper alloys—Ingots and castings
- 1572 Copper and copper alloys—Seamless tubes for engineering purposes
- 1646 Elastomeric seals for waterworks purposes
 - 1646.1 Part 1: General requirements
 - 1646.2 Part 2: Material requirements for pipe joint seals used in water and wastewater applications—Specifies by prescription formulation
 - 1646.3 Part 3: Material requirements for pipe joints seals used in water and wastewater applications with the exception of natural rubber and polyisoprene compounds
- 1830 Grey cast iron
- 1831 Ductile cast iron
- 2136 Method for detecting the susceptibility of copper and its alloys to stress corrosion cracking using the mercurous nitrate test
- 2345 Dezincification resistance of copper alloys
- 2738 Copper and copper alloys—Compositions and designations of refinery products, wrought products, ingots and castings
- 2887 Plastic waste fittings

- 4087 Metallic flanges for water works purposes
- 3688 Water supply—Copper and copper alloy body compression and capillary fittings and threaded-end connectors

AS/NZS

- 1567 Copper and copper alloys—Wrought rods, bars and sections
- 1568 Copper and copper alloys—Forging stock and forgings
- 3500 Plumbing and drainage
- 3500.0 Part 0: Glossary of terms
- 4020 Testing of products for use in contact with drinking water
- 4158 Thermal-bonded polymeric coatings on valves and fittings for water industry purposes
- 4796 Water supply—Metal bodied and plastic bodied ball valves for property service connection

ASTM

- A53/A53M Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless
- A536 Standard Specification for Ductile Iron Castings

ISO

- 5208 Industrial valves: Pressure testing of valves.
- 9393 Thermoplastics valves—Pressure test methods and requirements
- 9393-1 Part 1: General
- 9393-2 Part 2: Test conditions and basic requirements for PE, PP, PVC-U and PVDF valves

4 DEFINITIONS

For the purpose of this Technical Specification, the definitions given in AS/NZS 3500.0 apply.

5 MATERIALS

5.1 General

This Clause specifies requirements for materials utilized in the construction of the product.

5.2 Metallic materials

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

- (a) Copper, as specified in Clause 5.2.1.
- (b) Copper alloy, as specified in Clause 5.2.2 and Clause 5.2.3.
- (c) Stainless steel, as specified in Clause 5.2.4.

5.2.1 Copper

Copper shall comply with the following:

- (a) Wrought products AS 2738.
- (b) Tubular components Copper tube shall comply with AS 1432.

5.2.2 Copper alloy

5.2.2.1 Castings

Copper alloy castings shall comply with:

- (a) AS 1565; or
- (b) Where the alloy contains not less than 58% copper and 1% aluminium, be capable of passing the requirements of Clause 5.2.3.

5.2.2.2 Hot pressings

Copper alloy hot pressings shall comply with AS/NZS 1568.

5.2.2.3 Rod for machined parts

Copper alloy rod for machined parts shall comply with:

- (a) AS/NZS 1567; or
- (b) an alloy complying with AS 2345.

5.2.2.4 Tubular components

Copper alloy tubes shall be of the designation C26130 and comply with AS 1572. Where copper alloy tubes that are bent or stamped during manufacturing shall pass the stress corrosion test of ISO 6957, using a test solution of pH 9.5.

5.2.3 Dezincification-resistant (DR) copper alloy

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

5.2.4 Stainless steel

5.2.4.1 Stainless steel components

Stainless steel components shall comply with:

- (a) For wrought - ASTM A276.
- (b) For tubular in contact with water - ASTM A269 and be of Grades 304, 316, 316L, 316Ti, UNS S31803 (2205) or equivalent.
- (b) For tubular not in contact with water – ASTM A269 and be of Grades 304, 304L, 304LN, 316, 316L, 316Ti, UNS S31803 (2205) or equivalent.

5.2.4.2 Stainless steel springs

Where used for springs, bright stainless steel hard drawn wire of Grade 301, or higher shall be used.

5.2.5 Cast iron

Cast iron utilized as body components not in contact with water shall be grey cast iron in accordance with AS 1830 at least Grade T220 (equivalent material ASTM A53 Class B).

5.2.6 Ductile iron

Ductile iron utilized as body components not in contact with water shall be in accordance with AS 1831 minimum grade 450-10 (equivalent material ASTM A536 Gr 65 45 12).

5.3 Plastics materials

5.3.1 General

Plastics materials under hydrostatic pressure shall be suitable for use at the maximum operating pressure and temperature for the intended life of the product.

5.3.2 UV Resistance

For outdoor applications, the plastic material formulation shall be stabilized by suitable ultraviolet light stabilizers.

5.4 Elastomeric materials

The materials used for seals or gaskets shall comply with AS 1646.1 and AS 1646.2.

5.5 Coatings and linings

Coatings and linings in contact with water shall comply with AS/NZS 4158.

6 MARKING

Each valve shall be permanently and legibly marked with the following:

- (a) Manufacturer's name, brand or trademark.
- (b) Nominal size.
- (c) Pressure classification as PN or maximum operating pressure (MOP).
- (d) WaterMark.
- (e) Licence number.
- (f) The number of this Technical Specification, i.e., WMTS-012.

NOTE: The number of the Technical Specification may be in an abbreviated form, i.e. S012 where space is limited.

7 PACKAGING

VOID

8 DESIGN

8.1 End connectors

End connectors for connection to either copper or copper alloy metallic pipes or fittings shall comply with AS 3688 or AS 4087. Other connection ends shall comply with the requirements relevant to the connection.

9 PERFORMANCE REQUIREMENTS AND TEST METHODS

9.1 Products in contact with drinking water

Products in contact with drinking water shall comply with AS/NZS 4020. Products shall be tested as in-line devices, utilizing a scaling factor of 0.01.

9.2 Torque test for body assembly

When tested in accordance with Appendix B, the valve shall show no signs of splitting, cracking, distortion or thread damage.

9.3 Plastic-bodied valves material test

Plastic-bodied valves shall comply with the requirements of the plastic-bodied materials test of AS 4796.

9.4 Hydraulic strength test

9.4.1 *Metallic-bodied valves*

When tested in accordance with ISO 5208, the body (shell) and seat shall not leak.

9.4.2 *Plastic-bodied valves*

When tested in accordance with ISO 9393-1 and ISO 9393-2, the body (shell), complete valve and seat and packing shall show no visible damage or leak.

10 TEST SEQUENCE AND TEST SAMPLE PLAN

VOID

11 PRODUCT DOCUMENTATION

11.1 Product data

Product data that identifies critical product characteristics such as pressure/temperature or other limitations shall be made available.

APPENDIX A MEANS FOR DEMONSTRATING COMPLIANCE WITH THIS TECHNICAL SPECIFICATION

(Normative)

A.1 SCOPE

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

The certification scheme serves to indicate that the products consistently conform to the requirements of this 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

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, all the same nominal diameter and wall thickness, 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 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 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 Technical Specification.

Table A1—TYPE TESTS

Characteristic	Clause	Requirement	Test method	Frequency
Materials	5.1 to 5.4	Composition, temper, etc.	Review materials parts lists and compliance certificates	At any change in materials specification
	5.5	Coatings	AS/NZS 4158	At any change in the design
Design	8.1	End connections	AS 3688 or AS 4087/ Relevant Standard	At any change in the design
Performance	9.1	Products in contact with drinking water	AS/NZS 4020	At any change in materials, formulation or design or every five years, whichever occurs first
	9.2	Torque test for body assembly	Appendix B	At any change in design or manufacturing process
	9.3	Plastic-bodied valves material test	Appendix C	
	9.4	Hydraulic strength test	ISO 5208/ISO 9393	
Product documentation	11	Product data and installation instructions	Documentation review	At any change factors that require a change in documentation, e.g., amendments to AS/NZS 3500 series of Standards

Table A2—BATCH RELEASE TESTS

Characteristic	Clause	Requirement	Test method	Frequency
Materials	5	Composition, temper, etc.	Delivery acceptance tests or supplier's quality certificate	Once per delivery batch
	5.5	Coatings	AS/NZS 4158	Once per batch
Marking	6	Marking	Visual examination	Once per batch
Design	8.1	End connections	AS 3688 or 4087/ Relevant Standard	Once per batch
Production tests	9.4	Hydraulic strength test	ISO 5208/ISO 9393	Once per batch

APPENDIX B TORQUE TEST

(Normative)

B1 SCOPE

This Appendix sets out the method of torque testing a valve body assembly. It measures the ability of the valve to withstand the torques that would normally be encountered in normal installation.

B2 PRINCIPLE

The valve assembly is held on one side of a test rig and a predetermined torque is applied to the assembly. The assembly is then inspected for damage and a watertightness test undertaken.

B3 APPLICATION

End-of-line valves used for draw-off shall be tested in the closed position only. In-line valves shall be tested in both the open and closed positions.

B4 APPARATUS

The following apparatus is required:

- (a) A hot water supply system capable of producing a constant supply of hot water.
- (b) A fixing jig to hold one side of the valve assembly firmly at the opposing connection end.
- (c) A torque wrench with an accuracy within 5%. Alternatively a lever arm may be used with a known force applied at its end at 90 ± 5 to the radii between the centre of rotation and the centre point of the application of the force. The lever arm method used shall be at least the same accuracy as that of the torque wrench.

TABLE B1
TORQUE LOADINGS

Nominal Size DN	Torque N.m +5, -0%
15	30
20	40
25	60

B5 PROCEDURE

The procedure shall be as follows:

- (a) Mount the assembly into a fixing jig that is designed to hold one side of the valve assembly firmly. During testing the threaded section of the component under test shall not be supported in any way as to influence the results of the test.
- (b) Apply the torque loading to the end connection in the same manner as that normally applied in field conditions.
- (c) With the water supply connected to the assembly under test and with the nut hand tightened turn on the hot water supply. When the temperature has been stabilized to the test temperature of 80°C and maintained for a minimum of 60 s, apply the torque as identified in Table B1 for a period of 10 to 20 s.
- (d) Remove the torque and repeat Steps (a), (b) and (c) on the other nuts, if any.
- (e) Remove the valve assembly from the jig and inspect all components for cracking, breakage or thread damage.

B6 REPORT

The following shall be reported:

- (a) Manufacturer, model, type and size of valve.
- (b) Torque applied and duration of application.
- (c) Any splitting, cracking, distortion or thread damage or other failure.
- (d) Reference to this test method, i.e. Appendix B of WMTS-012.

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