



WMTS-476:2016

Heated Water Systems

– Leak protection device

WaterMark Technical Specification

2016



ABCB



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Heated water systems – Leak protection device

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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 5200.476 – 2006.

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-476: 2016 Technical Specification for plumbing and drainage products, Heated water systems – Leak protection device was originally prepared by the Joint Standards Australia/Standards New Zealand Committee WS-031, Technical Procedures for Plumbing and Drainage Products Certification.

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 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 authorization 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 ATS 5200.476 – 2006, 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 9 November 2005.

The following organisations were represented on Committee WS-031 in the preparation of Australian Technical Specification ATS 5200.476 – 2006.

- AUSTAP
- Australian Electrical and Electronic Manufacturers Association
- Australian Industry Group
- Australian Stainless Steel Development Association
- Building Officials Institute of New Zealand
- Building Research Association New Zealand
- Certification Interests (Australia)
- Copper Development Centre – Australia
- Master Plumbers, Gasfitters and Drainlayers New Zealand
- National Fire Industry 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 a device specifically designed to detect leaks and shut off the water supply in heated water systems when utilised in association with a safe tray.

The leak protection device is intended to be fitted on the cold water supply to a storage water heater installed in a safe tray that does not have a safe waste.

2 APPLICATION

This Technical Specification will be referenced on the WaterMark Certification Scheme Schedule of Specifications.

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
- 1589 Copper and copper alloy waste fittings
- 1646 Elastomeric seals for waterworks purposes (all parts)
- 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

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

3500.4 Part 4: Heated water services

ASTM

A312 Standard Specification for Seamless, Welded, and Heavily Cold Worked Austenitic Stainless Steel Pipes

EN

10088 Stainless steels

10088-2 Part 2: Technical delivery conditions for sheet/plate and strip for general purposes

4 DEFINITIONS

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

5 MATERIALS

5.1 General

This section specifies requirements for materials utilised 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 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*

Copper alloy shall comply with the following:

- (a) *Castings* AS 1565 or capable of passing the requirements of Clause 5.3 provided, the alloy contains not less than 58% copper and not more than 1% aluminium.
- (b) *Hot pressings* AS/NZS 1568.
- (c) *Rod for machined parts* AS/NZS 1567 or an alloy complying with AS 2345.
- (d) *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 mercurous nitrate test specified in AS 2136 after all fabrication processes are complete. For the purpose of this test, the entire tube component shall be tested before any coating or plating operation.

5.2.3 *Dezincification-resistant (DR) copper alloy*

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

5.2.4 *Stainless steel*

Stainless steel for manufacture of pipes or tubes shall comply with ASTM A312/A grade 304 and 316, or EN 10088-2 Grade 1.4401 (equivalent to grade designation).

5.3 Plastics materials

5.3.1 General

Under hydrostatic pressure, plastics materials shall be able to demonstrate suitability at the maximum operating pressure and temperature for the intended life of the product.

5.3.1.1 *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 or AS 1646.3 or AS 1646.4.

Materials used for gaskets shall comply with WSA 109.

6 MARKING

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

- (a) Manufacturer's name, brand or trademark.
- (b) An indicator identifying manual tripping mechanism.

- (c) Operation to arm the device.
- (d) Indication of the position of the device, i.e., armed/unarmed.
- (e) Warning identifying that the device needs to be manually tripped once/6 months and rearmed.
- (f) WaterMark.
- (g) Licence number.
- (h) The number of this Technical Specification, i.e., WMTS-476.

NOTE: Where space is limited, the number of the Technical Specification may be in abbreviated form, i.e., S476.

7 PACKAGING

The leak protection device shall be packaged in such a manner so as to avoid damage in transit.

8 DESIGN

8.1 Included valve

The water-carrying component shall be a WaterMark certified valve with included end connections suitable for connection to the water supply system.

8.2 Resetting mechanism

The design shall include a mechanism to reset the device after test activation.

8.3 Manual trip

The design shall include a mechanism to manually activate the valve.

8.4 Activation mechanism

The power source to close the valve shall be self-contained within the device.

9 PERFORMANCE REQUIREMENTS AND TEST METHODS

9.1 Closing test

When tested in accordance with Appendix B, the device shall activate by the time the water level in the safe tray reaches 75% of minimum safe tray depth (38 mm), close leak tight and be able to be reset once the water level is removed.

9.2 Endurance test

After being subjected to 50 cycles in accordance with Appendix C, there shall be no visible signs of damage to the operating mechanism and no failure to activate in accordance with the requirements of Clause 9.1 during any of the activations.

10 VOID

11 PRODUCT DOCUMENTATION

11.1 Product data

Product documentation that identifies the maximum allowable operating pressure and temperature and other critical product characteristics shall be available.

11.2 Installation and maintenance instructions

11.2.1 *Installation instructions*

Installation instructions that give full details of installation procedures for the leak detection device shall be provided, and shall include the following:

- (a) Reference to AS/NZS 3500.4.
- (b) Detailed step-by-step instructions.
- (c) Details of any special tools or training that may be required to install the product.
- (d) Details of commissioning procedures and any required adjustments.
- (e) Troubleshooting guide.
- (f) Contact details for after-sales service.

11.2.2 *Operating and maintenance instructions*

Operating and maintenance shall include the following:

- (a) Any regular maintenance requirements.
- (b) Spare parts information.
- (c) Troubleshooting guide.
- (d) Contact details for after-sales service.

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 is to 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 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 module 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	Material composition, temper, etc.	Standard relevant to the material type	At any change in materials specification
Marking	6	Labelling/Marking	Review of documentation/physical examination	At any change in design/specification
Packaging	7	Protection of transit damage		
Design	8.1	Included valve	Clause 8.1	At any change in the design
	8.2	Resetting mechanism	Clause 8.2	
	8.3	Manual trip	Clause 8.3	
	8.4	Activation mechanism	Clause 8.4	
Performance	9.1	Closing test	Appendix B	At any change in design
	9.2	Endurance test	Appendix C	
Product documentation	11	Product data, installation, operating and maintenance instructions	Documentation review	At any change factors that require a change in documentation e.g., amendments to AS/NZS 3500.4.

Table A2— BATCH RELEASE TESTS

Characteristic	Clause	Requirement	Test method	Frequency
Materials	5	Composition, temper, etc	Delivery acceptance tests or supplier's quality certificate to Standard relevant to the material type	Each delivery batch
Marking	6	Marking	Visual examination	Once per batch
Performance	9.1	Closing test	Appendix B	Once per batch

Appendix B CLOSING TEST

(Normative)

B.1 SCOPE

This Appendix sets out the method for conducting a closing test of the device.

B.2 PRINCIPLE

The device is subjected to a condition that represents a normal installation where the device is activated by simulating a typical leak.

B.3 APPARATUS

The following apparatus is required:

- (a) Simulated, 50 mm deep safe tray, large enough to hold the leak protection device.
- (b) Water supply system.
- (c) Means for connecting the water supply to the device to be tested.
- (d) Means to fill the simulated safe tray with water without the device being subject to water level surges, or waves.

B.4 PROCEDURE

The procedure shall be as follows:

- (a) Fit and activate the device in the safe tray as required by the manufacturer's instructions.
- (b) Open the water supply valve to maintain a small flow through the device at 500 kPa supply pressure.
- (c) Slowly increase the water level in the simulated safe tray.
- (d) Record the level of the safe tray when the device activates and whether the device sealed off leak tight (i.e., small flow from Step (b) should cease when the device closes).

B.5 TEST REPORT

The following shall be reported:

- (a) Manufacturer and model identification.
- (b) Level at which the device activated.

- (c) If the valve closed leak tight.
- (d) Reference to this test method, i.e., WMTS-476, Appendix B.

Appendix C ENDURANCE TEST

(Normative)

C.1 SCOPE

This Appendix sets out the method for conducting a cyclic test of a leak protection device.

C.2 PRINCIPLE

The device is subjected to a number of cycles of activation and resetting.

C.3 APPARATUS

The following apparatus is required:

- (a) Simulated, 500 mm deep safe tray, large enough to hold the leak protection device.
- (b) Water supply system.
- (c) Means for connecting the water supply to the device to be tested.
- (d) Means to fill the simulated safe tray with water without the device being subject to water level surges, or waves.

C.4 PROCEDURE

The procedure shall be as follows:

- (a) Fit and activate the device in the safe tray as required by the manufacturer's instructions.
- (b) Open the water supply valve to maintain a small flow through the device at 500 kPa supply pressure.
- (c) Slowly increase the water level in the simulated safe tray.
- (d) Record the level of the safe tray when the device activates and whether the device sealed off leak tight (i.e., small flow from step (b) should cease when the device closes).
- (e) Drain the safe tray and reset the device. Repeat the test for 50 cycles.

C.5 TEST REPORT

The following shall be reported:

- (a) Manufacturer and model identification.
- (b) Number of cycles conducted.
- (c) Any physical damage to the device operating mechanism.
- (d) Any failure to activate during any of the individual activations.
- (e) Reference to this test method, i.e., WMTS-476, Appendix C.

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