



WMTS-486:2016

Fire sprinkler heads for domestic applications

WaterMark Technical Specification

2016



ABCB



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Fire sprinkler heads for domestic applications

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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 5200.486 – 2008.

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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General Manager
Australian Building Codes Board
GPO Box 9839
Canberra ACT 2601
Phone 1300 134 631 – Fax 02 6213 7287

PREFACE

WaterMark Technical Specification WMTS-486: 2016 Technical Specification for plumbing and drainage products, Fire sprinkler heads for domestic applications 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 5200.486 – 2008, 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 7 August 2008.

The following organisations were represented on Committee WS-031 in the preparation of Australian Technical Specification ATS 5200.486 – 2008.

- Australian Industry Group
- Australian Stainless Steel Development Association
- Certification Interests (Australia)
- Copper Development Centre – Australia
- National Plumbing Regulators Forum
- Plastics Industry Pipe Association of Australia
- Plumbing Products Industry Group
- South Australian Water Corporation
- Water Services Association of Australia

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1 SCOPE

This Technical Specification sets out requirements to ensure that home sprinklers incorporated in a domestic water supply in buildings are suitable for the purpose and are not likely to compromise the quality of water.

NOTE: Home sprinklers are designed to be installed as part of active fire protection systems for Class 1 buildings in accordance with AS 2118.5.

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

- 2118 Automatic fire sprinkler systems
- 2118.5 Part 5: Home fire sprinkler systems
- 1565 Copper and copper alloys—Ingots and castings
- 1646 Elastomeric seals for waterworks purposes
- 3688 Water supply—Metallic fittings and end connectors
- 4118 Fire sprinkler systems
- 4118.1.1 Part 1.1: Components—Sprinklers and sprayers

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 (all parts)
- 3500.0 Part 0: Glossary of terms
- 3500.1 Part 1: Water supply
- 4020 Testing of products for use in contact with drinking water

ASME

B1.20.1 Pipe Threads, General Purpose, Inch

4 DEFINITIONS

For the purposes of this Technical Specification, the definitions in AS/NZS 3500.0, AS 2118.5 and those below apply.

4.1 Sprinkler

A fire sprinkler intended to be installed in homes.

4.2 Sprinkler type

- 1 *Flush ceiling type* A sprinkler having only a minimum of parts that project below the ceiling.
- 2 *Concealed ceiling type* A recessed sprinkler that has a factory coating, paint or plating for decorative purposes.
- 3 *Pendent type* A sprinkler intended to be installed so that its deflector is located below the ceiling.

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 are considered to be suitable:

- (a) *Stainless steel Grade 316* Stainless steel component shall comply with ASTM A269, Series 3000, Grade 316.
- (b) *Dezincification-resistant copper alloy* Copper alloy shall comply with the following:
 - (i) Casting—AS 1565 and having a lead content of less than 4.5%.
 - (ii) Hot pressing—AS/NZS 1568.
 - (iii) Rod machine for parts—AS/NZS 1567.

5.3 Elastomeric materials

The materials used for seals or gaskets shall comply with AS 1646.

6 MARKING

Each sprinkler package shall be marked with the following:

- (a) WaterMark.
- (b) WaterMark licence number.
- (c) The number of this Technical Specification, i.e., WMTS-486.
- (d) UL listing/FM approval, or LPC approval.
- (e) The words 'Home Sprinklers'.
- (f) Manufacturer's name, brand or trademark.

7 PACKAGING

The sprinkler shall be packaged in such a manner as to avoid damage during transportation and handling. The labelling requirements shall be clearly marked on the packaging.

8 DESIGN

8.1 End connectors

End connectors shall comply with the requirements of the Standard relevant to the piping system and AS 3688.

The following thread sizes complying with ASME B1.20.1 shall be deemed acceptable for this application:

- (a) ½" NPT.
- (b) ¾" NPT.

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.

Sprinkler assemblies shall be tested in accordance with in-the-product exposure, so that only the surface that is normally wetted in end use is exposed to the test water. The test water shall be cold, with a scaling factor of 0.01 applied.

NOTE: The sprinklers are generally deemed to be wholly metallic unless there are non-metallic components in contact with water in the wetted areas. For the purposes of evaluation, the wetted areas are deemed to be surfaces of the sprinkler (normally the

internal surface of the frame and the button of the sprinkler assembly) where water can back-siphon into the domestic piping.

9.2 Hydrostatic strength test

When tested in accordance with Appendix B at ambient temperature and 1.5 times the maximum operating pressure, for 60 s–0 +10 s, there shall be no leakage or failure of the sprinkler.

NOTE: This test may be waived if the sprinkler has been tested for hydrostatic strength in accordance with the tests set out in AS 4118.1.1.

9.3 Endurance test

When tested in accordance with Appendix C for 10 000 cycles, there shall be no leakage, or visible or functional failure of the device.

NOTE: This test may be waived if the sprinkler has been tested for water-hammer in accordance with the tests set out in AS 4118.1.1.

10 VOID

11 PRODUCT DOCUMENTATION

The manufacturer's data sheets, including installation instructions, product performance characteristics and operating limitations, shall be included in product packaging.

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 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 frequency of the sampling and testing plan as detailed in Paragraph A5, shall be used by the WaterMark Conformity Assessment Body (WMCAB). 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 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.4.2 Sampling plan

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

A.4.3 Type test batch

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

A.4.4 Type testing

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 WMCAB 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	Relevant Standard	Review materials parts lists and data/test reports	At any change in materials specification
Marking	6	Marking	Visual inspection	At any change in design/specification
Packaging	7	Protection from damage during transportation and handling	Review of documentation/physical examination	
Design	8.1	End connectors	Relevant Standards	At any change in design/specification
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	Hydrostatic strength test	Appendix B	At any change in design or manufacturing process
	9.3	Endurance test	Appendix C	
Product documentation	11	Product data/installation, operation and maintenance 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	Relevant Standard	Delivery acceptance tests or supplier's test data	Each delivery batch
Marking	6	Marking	Visual examination	Once per batch
Performance	9.2	Hydrostatic strength test	Appendix B	Once per batch

Appendix B HYDROSTATIC STRENGTH TEST

(Normative)

B.1 SCOPE

This Appendix sets out the method for determining the ability of a sprinkler to withstand hydrostatic pressures.

B.2 PRINCIPLE

The sprinkler is subjected to a hydrostatic pressure for a period of time and inspected for structural damage.

B.3 APPARATUS

The following apparatus is required:

- (a) Water supply source sufficient to maintain the required pressure.
- (b) Pressure gauge.

B.4 PROCEDURE

The procedure shall be as follows:

- (a) Mount the sprinkler in a suitable jig and connect the water supply to the inlet of mains water supply. Block the other ends with suitable plugs that contain fittings in order to de-air the device.
- (b) Supply water at ambient temperature to the device and purge all the air from the sprinkler.
- (c) Slowly increase the pressure until it reaches the test pressure.
- (d) Maintain this pressure for the test duration.
- (e) Release the pressure.
- (f) Record the test pressure, temperature and duration at this pressure.
- (g) Inspect the sprinkler for any leaks or structural damage.

B.5 TEST REPORT

The following shall be reported:

- (a) Manufacturer, model, type and size of sprinkler.
- (b) Any leakage or structural damage.
- (c) Reference to this test method, i.e., WMTS-486, Appendix B.

Appendix C ENDURANCE TEST

(Normative)

C.1 SCOPE

This Appendix sets out the method for determining the ability of a sprinkler assembly to withstand repetitive cycles of operation.

C.2 PRINCIPLE

The sprinkler is subjected to repetitive cycles of pressure as would occur in normal installation and then checked for any failures in terms of function, leakage or damage to components.

C.3 APPARATUS

The following apparatus is required:

- (a) A water supply system with necessary controls capable of varying pressure and flow rate.
- (b) Suitable measuring equipment capable of measuring pressure and flow rate.

C.4 PROCEDURE

The procedure shall be as follows:

- (a) Mount the sprinkler in a suitable jig and connect the water supply.
- (b) Supply water at ambient temperature to the valve and purge all the air.
- (c) Adjust the pressure to 500 kPa with a flow rate of between 10 L/min and 15 L/min.
- (d) Stop flow and adjust pressure to the manufacturer's set draw-off pressure.
- (e) Start flow again to reach a pressure of 500 kPa and flow rate of between 10 L/min and 15 L/min.
- (f) Repeat Steps (c) to (e) for the specified number of cycles.
- (g) Test sprinkler head in accordance with Appendix B.

C.5 TEST REPORT

The following shall be reported:

- (a) Manufacturer, model, type and size of sprinkler.
- (b) Pressure and flow rates.
- (c) Draw-off pressure and any changes to this pressure during the cycling.
- (d) Any leakage, visible or functional failure of the sprinkler.
- (e) Reference to this test method, i.e., WMTS-486, Appendix C.

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Australian Building Codes Board
GPO Box 9839
Canberra ACT 2601
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