



# **WMTS-475:2016**

## **Heated Water Systems**

### **– Cold water recovery device**

---

**WaterMark Technical Specification**

**2016**



**ABCB**





**WMTS-475:2016**

**Heated Water Systems – Cold water recovery device**

---

**WaterMark Technical Specification**

Document formerly known as:-

ATS 5200.475 – 2006 Technical Specification for Plumbing and Drainage Products  
Heated Water Systems – Cold water recovery device

Publication History:-

First published as ATS 5200.475—2006.  
Revised and redesignated as WMTS-475:2016.

**2016**

## **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 5200.475 – 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).

While the ABCB, the participating Governments and other groups or individuals who have endorsed or been involved in the development of the WMTS, have made every effort to ensure the information contained in this document is accurate and up to date, such information does in no way constitute the provision of professional advice.

The ABCB gives no warranty or guarantee and accepts no legal liability whatsoever arising from or connected to, the accuracy, reliability, currency or completeness of any material contained in this document.

Users should seek appropriate independent professional advice prior to relying on, or entering into any commitment based on material in this document in relation to plumbing or related activities. Its interpretation in no way overrides the approvals processes in any jurisdiction.

The ABCB welcomes suggestions for improvement in the WMTS, and encourage readers to notify us immediately of any apparent inaccuracies or ambiguities. Contact the ABCB via phone on 1300 134 631, email at [watermark@abcb.gov.au](mailto:watermark@abcb.gov.au) or write to the WaterMark Administering Body, ABCB, GPO Box 9839, Canberra ACT 2601.

Copyright within the following document is owned by the Australian Government and States and Territories of Australia and its Licensors.

Apart from any use permitted under the Copyright Act 1968, no part may be reproduced without prior permission. Requests and enquires concerning reproduction and rights should be directed to:

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-475: 2016 Technical Specification for plumbing and drainage products, Heated Water System – Cold water recovery devices 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](http://www.abcb.gov.au)). These lists will be version controlled with appropriate historic references.

## **ACKNOWLEDGEMENTS**

Australian Technical Specification ATS 5200.475 – 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 19 October 2006.

The following organisations were represented on Committee WS-031 in the preparation of Australian Technical Specification ATS 5200.475 – 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 (BRANZ)
- Certification Interests (Australia)
- Copper Development Centre – 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

## TABLE OF CONTENTS

1	Scope .....	6
2	Application.....	6
3	Referenced documents.....	6
4	Definitions.....	7
5	Materials .....	7
6	Marking .....	9
7	Packaging .....	9
8	Design .....	9
9	Performance requirements and test methods.....	10
10	Void .....	10
11	Product documentation .....	10
Appendix A	Means for demonstrating compliance with this technical specification....	12
Appendix B	Hydrostatic strength test .....	15
Appendix C	Functional test .....	16

## **1 SCOPE**

This Technical Specification sets out requirements for a water recovery device installed in the heated/cold water supply system. The device transfers water as the first flush in a heated water line to be stored and used back in the cold water supply system or diverted to be used for other purposes.

## **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 Specification:

AS

- 1357 Valves primarily for use in heated water systems
- 1357.2 Part 2: Control valves
- 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
- 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
- 1646.4 Part 4: Material requirements for pipe joint seals used in water and wastewater applications—Thermoplastic elastomers and vulcanizates
- 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

4087 Metallic flanges for water works purposes

#### 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

3500.1 Part 1: Water services

3500.2 Part 2: Sanitary plumbing and drainage

3500.4 Part 4: Heated water services

3500.5 Part 5: Domestic installations

4020 Testing of products for use in contact with drinking water

#### WMTS

WMTS481 Thermal switching valves

WMTS485 Pressure compensating tank

## 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

#### 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.

- (c) Stainless steel, as specified in Clause 5.2.5.

**5.2.2** *Copper*

Copper shall comply with the following:

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

**5.2.3** *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.

**5.2.4** *Dezincification-resistant (DR) copper alloy*

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

**5.2.5** *Stainless steel*

Stainless steel shall be grade 304 or 316 complying with the relevant ASTM Standard for the product form.

**5.3** **Plastic materials**

**5.3.1** *General*

Plastic materials shall comply with the relevant Standard for the product type or type of material used.

**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 or AS 1646.3 or AS 1646.4.

## **6 MARKING**

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

- (a) Manufacturer's name, brand or trademark.
- (b) Direction of flow and outlet/inlet designation where relevant.
- (c) WaterMark.
- (d) Licence number.
- (e) The number of this Technical Specification, i.e., WMTS-475.

Components not integral with the device shall also be suitably marked.

*NOTE: Where space is limited, the number of the Technical Specification may be an abbreviated form, i.e., S475.*

## **7 PACKAGING**

The device and accessories shall be packaged in such a manner so as to avoid damage during transportation and handling.

## **8 DESIGN**

### **8.1 General construction/design**

The device shall incorporate the following components in order to enable satisfactory performance when installed in accordance with the manufacturer's instructions and when tested in accordance with Appendix B and specifically:

- (a) Diversion valve shall comply with WMTS-481.
- (b) Accumulator/Bladder tank shall comply with WMTS-485.
- (c) Pressure reduction valves shall comply with AS 1357.2.

### **8.2 Accumulator/bladder tank**

An accumulator/bladder tank as an essential component of the design shall have sufficient capacity to store water from more than one operation.

### **8.3 Other integral plumbing components, accessories or fittings**

Where the product includes other integral plumbing components, accessories or fittings that require certification as identified in the Plumbing Code of Australia they shall comply with the applicable requirements of the specification for that product as identified in WaterMark Schedule of Specifications.

### **8.4 End connectors**

End connectors for connection to metallic or plastics piping systems shall comply with the requirements of the Australian Standard (AS) or WaterMark Technical Specification (WMTS) relevant to the piping system.

## **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.

### **9.2 Hydrostatic strength/Watertightness test**

When tested in accordance with Appendix B, the device shall not leak or exhibit any deformation or structural damage.

### **9.3 Functional test**

When tested in accordance with Appendix C, the system shall efficiently divert the unwanted water from the hot water system and release back to the cold water system or other recovery method.

## **10 VOID**

## **11 PRODUCT DOCUMENTATION**

### **11.1 Product data**

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

- (a) Maximum allowable operating pressure and temperature.
- (b) Minimum operating pressure.
- (c) Device operation and capability.

## 11.2 Installation and maintenance instructions

### 11.2.1 *Installation instructions*

Full installation instructions shall be provided, which shall include the following:

- (a) Reference to AS/NZS 3500 where applicable.
- (b) Step-by-step instructions.
- (c) The need for special tools or training.
- (d) Commissioning procedures and adjustments required.
- (e) Troubleshooting guide.
- (f) Contact details for after-sales service.

### 11.2.2 *Operating and maintenance instructions*

Operating and maintenance instructions shall be provided, which 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 can 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. 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, which 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, 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 reverification.

### **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	Relevant Standard	Review materials parts lists and data/test reports	At any change in materials specification
Marking	6	Marking	Review of documentation/physical examination	At any change in design/specification
Packaging	7	Protection of damage during transportation and handling		
Design	8.1	General construction/design	Applicable specification	At any change in design/specification
	8.2	Accumulator/bladder tank	Design review	
	8.3	Other integral plumbing components, accessories or fittings	Applicable specification	
	8.4	End connections	AS or WMTS relevant to the piping system	
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/Watertightness	Appendix B	At any change in design or manufacturing process
	9.3	Functional 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	100%
Performance	9.3	Watertightness test (undertaken at manufacturer's maximum operating pressure)	Appendix B	Each device
	9.5	Functional test (within manufacturer's limits)	Appendix C	



## Appendix B HYDROSTATIC STRENGTH TEST

(Normative)

### B.1 SCOPE

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

### B.2 PRINCIPLE

The device is subjected to a hydrostatic pressure for a period of time and inspected for structural damage. The test is conducted at ambient temperature.

### B.3 APPARATUS

The following 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 device 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 to the device and purge all the air from the device.
- (c) Slowly increase the pressure until it reaches the test pressure of  $2 -0 +0.1$  MPa.
- (d) Maintain this pressure for the test duration of a minimum of 60 s.
- (e) Release the pressure.
- (f) Record the test pressure, temperature and duration at this pressure.
- (g) Inspect the device for any leaks or structural damage.

### B.5 TEST REPORT

The following shall be reported:

- (a) Manufacturer, model, type and size of device.
- (b) Any leakage or structural damage.
- (c) Reference to this test method, i.e., WMTS-475, Appendix B.

## Appendix C FUNCTIONAL TEST

(Normative)

### C.1 SCOPE

This Appendix sets out the method for determining the efficient functioning of the water saving system.

### C.2 PRINCIPLE

The system is installed in accordance with the manufacturer's instructions and plumbing practices and subjected to normal operating conditions and the system is monitored for the efficient transfer of water from hot to cold water system.

### C.3 APPARATUS

The following is required:

- (a) Hot and cold water supply systems.
- (b) Pressure gauges.
- (c) Means for connecting the source of water supply to the water saving system to be tested so that it can be installed in accordance with the manufacturer's instructions.

### C.4 PROCEDURE

The procedure shall be as follows:

- (a) Install the system in accordance with the manufacturer's instructions.
- (b) Turn on hot water tap.
- (c) Monitor transfer to cold water system by way of bypass to the accumulator—this is physically monitored by no water flow at the hot water tap (small drips are acceptable) and air pressure/water pressure at the accumulator.
- (d) Observe the commencement of hot water supply at the hot water tap and measure the temperature and time taken.
- (e) Close the hot water tap.
- (f) Turn on cold water and check whether water is transferred from the accumulator/bladder to the cold water system. This is monitored by air pressure/water pressure changes at the accumulator/bladder.

## C.5 TEST REPORT

The following shall be reported:

- (a) Manufacturer, model, type and application of water saving system.
- (b) Time of supply of hot water from turning on the supply till the appearance of hot water.
- (c) If the system functioned in a normal manner.
- (d) Reference to this test method, i.e., WMTS-475, Appendix C.

**Australian Building Codes Board**  
*Building Australia's Future*

**Australian Building Codes Board**  
**GPO Box 9839**  
**Canberra ACT 2601**  
**[www.abcb.gov.au](http://www.abcb.gov.au)**