WMTS-055:2023

Plastic fittings – Connectors with flexible intermediate joints for drainage and sewerage applications

WaterMark Technical Specification

Document formerly known as:-

ATS 5200.055 – 2008 Technical Specification for Plumbing and Drainage Products Plastic fittings – Connectors with flexible intermediate joints for drainage and sewerage applications.

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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 5200.055 – 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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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 or write to the WaterMark Administering Body, ABCB, GPO Box 9839, Canberra ACT 2601.

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PREFACE

WaterMark Technical Specification WMTS-055: 2016 Technical Specification for plumbing and drainage products, Part 055 Plastic fittings – Connectors with flexible intermediate joints for drainage and sewerage 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 major changes to this revision are as follows: -

(i) Scope expansion to include fittings from existing limitation of DN225 to DN300
(ii) Deletion of compression strength and addition of tear strength within Table 5.1.
(iii) Additional marking requirements included.
(iv) General update in several areas due to changes to referenced standards since the initial issue (2016)
(v) Inclusion of compliance Tables A3 and A4

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 5200.055 – 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 5200.055 – 2008.

- AUSTAP
- Australian Industry Group
- Certification Bodies (Australia)
- Copper Development Centre, Australia
- Fire Contractors Federation
- Master Plumbers, Gasfitters and Drainlayers New Zealand
- New Zealand Water and 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

This Technical Specification sets out requirements for plastics bodied fittings of nominal sizes up to DN 300 with intermediate flexible joints for sewer or drain applications. These fittings are for use above or below ground and intended to be used where the pipeline is operating under gravity flow and the operating pressure is low. The design of the fitting is such that it compensates for misalignment or movement that may be encountered in pipeline installations.

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 the 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

1646	Elastomeric seals for waterworks purposes

AS/NZS

1260	PVC-U pipes and fittings for drain, waste and vent application
1462	Methods of test for plastics pipes and fittings
1462.1	Method 1: Method for determining dimensions of pipes and fittings
1462.8	Method 8: Method of testing the leak tightness of assemblies
1462.11	Method 11: Method for high temperature stress-relief testing of fittings
1462.13	Method 13: Method for the determination of elastomeric seal joint contact width and pressure
2032	Installation of PVC pipe systems
2033	Installation of polyethylene pipe systems
3500	Plumbing and drainage
3500.0	Part 0: Glossary of terms
3500.2	Part 2: Sanitary plumbing and drainage
3879	Solvent cements and priming fluids for PVC (PVC-U and PVC-M) and ABS pipes and fittings

4401 Plastics piping systems for soil and waste discharge (low and high temperature) inside buildings—Polyethylene (PE)

5065 Polyethylene and polypropylene pipes and fittings for drainage and sewerage applications

ISO

6402 Plastics—Acrylonitrile-styrene-acrylate (ASA), acrylonitrile— (ethylene-propylenediene)—styrene (AEPDS) and acrylonitrile— (chlorinated polyethylene)—styrene (ACS) moulding and extrusion materials

6402-1 Part 1: Designation system and basis for specifications

7245 Pipes and fittings of acrylonitrile/butadiene/styrene (ABS)—General specification for moulding and extrusion materials

WSA

117 Industry standard for Acrylnonitrile Butadiene Styrene (ABS) compounds, pipes and fittings for drainage and sewerage

4 DEFINITIONS

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

4.1 Expander joint

A joint design that allows movement in a lateral plane and includes a positive stop.

4.2 Swivel joint

A joint design that allows movement in a rotating plane and includes a positive stop.

5 MATERIALS

5.1 Plastics materials

5.1.1 General

Fittings shall be manufactured from plastic materials as defined in the standards relating to the material type.

5.1.2 Unplasticized polyvinyl chloride (PVC-U)

Fittings manufactured from PVC-U shall comply with the material requirements of AS/NZS 1260.

5.1.3 Acrylonitrile butadiene styrene (ABS)

Fittings manufactured from ABS shall comply with the material requirements of WSA 117.

5.1.4 Acrylonitrile styrene acrylate (ASA)

Fittings manufactured from ASA shall comply with the material requirements of WSA 117 with the exception that ISO 6402-1 shall be referenced in lieu of ISO 7245.

5.1.5 Polypropylene (PP)

Fittings manufactured from polypropylene (PP) shall comply with the material requirements of AS/NZS 5065.

5.1.6 Polyethylene (PE)

Fittings manufactured from Polyethylene (PE) shall comply with the material requirements of AS/NZS 5065 or AS/NZS 4401.

5.2 Elastomeric jointing seals

Elastomeric seals utilized as joints in the fittings shall be manufactured from materials complying with AS 1646.

5.3 Solvent cement

Fittings with tapered/interference fit joints manufactured to this Standard, which are suitable for solvent cement jointing, shall be used with solvent cements and priming fluids complying with AS/NZS 3879 (Type N).

6 MARKING

Markings to be placed on products and packaging, shall as a minimum, be in accordance with Clause 9.6 of the Manual for the WaterMark Certification Scheme.

In addition each fitting shall be permanently and legibly marked with the following:

(a) Plastics material used in the body of the fitting eg. PE, PP, ABS, ASA, PVC

(b) Manufacturer's name, brand or trademark.

(c) Nominal size in the form DN 100 or 100, as appropriate

(d) Month and Year of manufacture

7 PACKAGING

The fitting shall be packaged in such a manner so as to avoid damage during transportation and handling and in a manner that will maintain the physical and dimensional integrity of the fittings.

8 DESIGN

8.1 End connectors

8.1.1 *Solvent-welded joints*

Dimensions of solvent-welded joints shall comply with the requirements of the relevant Standard, as follows:

(a) Unplasticized polyvinyl chloride (PVC-U) ..... AS/NZS 1260.

(b) Acrylonitrile butadiene styrene (ABS)..... WSA 117.

8.1.2 *Elastomeric seal (rubber ring) joints*

General dimensions of elastomeric seal joints shall comply with the requirements of the relevant Standard as follows:

(a) Unplasticized polyvinyl chloride (PVC-U) materials..... AS/NZS 1260.

(b) Acrylonitrile butadiene styrene (ABS).....WSA 117.

(c) Polypropylene (PP)..... AS/NZS 5065.

(d) Polyethylene (PE) materials ..... AS/NZS 5065 or AS/NZS 4401.

8.2 Dimensions

8.2.1 General

Dimensions of the fittings shall comply with the requirements of the following Standards where applicable:

(a) Unplasticized polyvinyl chloride (PVC-U) ..... AS/NZS 1260.

(b) Acrylonitrile butadiene styrene (ABS)/
Acrylonitrile styrene acrylate (ASA) ..... WSA 117.

(c) Polypropylene (PP)..... AS/NZS 5065.

(d) Polyethylene (PE)..... AS/NZS 5065 or AS/NZS 4401.

8.2.2 Waterway/Clear bore

The waterway/clear bore of a fitting shall be determined by its ability to accept passage of a sphere of appropriate diameter as given in Table 5.5 AS/NZS 1260:

8.3 Freedom from defects

Defects shall not affect the performance or function of the fittings in service. Fittings shall be free from blisters and heat marks. When grooves, wrinkles, rippling, dents or projections are present,

the fitting shall comply with the dimensional requirements of this Technical Specification. Spigot ends of fittings shall be free from chips and rough edges and shall have sharp edges removed. Jointing surfaces shall be smooth.

8.4 Expander and swivel joints

8.4.1 Protection barrier

The design of the expander and swivel joints shall be such that the flexible joint shall include a solid barrier that is an integral part of the fitting to protect from the ingress of foreign material and for below-ground installations backfill material.

8.4.2 End stop

Expansion joints providing lateral movement shall be designed to limit the length of expansion in both directions by a physical stop.

9 PERFORMANCE REQUIREMENTS AND TEST METHODS

9.1 Elastomeric joints—Contact width and pressure

For fittings that are intended to be installed below ground when determined in accordance with AS/NZS 1462.13, the elastomeric joint contact pressure shall exceed 0.4 MPa over a continuous width of 4 mm.

9.2 Hydrostatic pressure test

When tested in accordance with AS/NZS 1462.8, without diametral distortion or angular deflection, the fitting shall withstand an internal pressure of 80 +5, -0kPa for 60 +5, -0min without leakage.

9.3 Liquid infiltration test

When tested in accordance with AS/NZS 1462.8, without diametral distortion or angular deflection, the fitting shall not leak when subjected to an internal vacuum corresponding to a gauge pressure of -80 +5, -0kPa for 60 +5, -0 min.

9.4 High temperature stress relief test (Injection-moulded fittings— PVC/ABS/ASA)

When determined in accordance with AS/NZS 1462.11, at a temperature of 150 ±4−C for 30 +3, −0 min, the high temperature stress-relief properties of the fitting shall comply with the following:

(a) There shall be no evidence of inclusions or voids of size greater than 20% of the wall thickness, up to a maximum of 1 mm.

(b) Delamination or damage at the injection point shall not have reduced the wall thickness to less than 50% of the minimum wall thickness.

(c) The weld line shall not open to a depth of more than 50% of the wall thickness.

NOTE: The weld line is likely to become prominent and the fitting distorted, but this does not constitute a failure.

(d) Not more than 5% of the total internal and external surface area of the fitting shall exhibit blisters and/or surface delamination.

10 TEST SEQUENCE AND TEST PLAN

Independent samples covering each nominal size and type shall be used for testing of the performance requirements of Clauses 9.1 to 9.3.

11 PRODUCT DOCUMENTATION

11.1 Product data

Product data shall be available that identifies critical product characteristics and as a minimum:

a) product range and model identification

b) limitations of fitting flexibility

c) application and limitations

11.2 Installation instructions

Instructions that give full details of installation procedures for the fitting shall be provided. The instructions shall include the following:

(a) References to AS/NZS 3500.2 and relevant installation Standards, i.e. AS/NZS 2032, AS/NZS 2033 where applicable.

(b) Detailed step-by-step instructions, including reference to connection of dissimilar materials if applicable.

(c) The need for special tools, training or jointing materials.

(d) Troubleshooting guide.

(e) 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 Tables A1,A3 and A4 shall be used by the WaterMark Conformity Assessment Body. The batch release testing program 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, 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 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 material data/Test reports	At any change in materials specifications
Marking	6	Marking	Review against documentation/Physical examination	At any change in design/Specifications
Packaging	7	Avoiding damage during transportation and handling		
Design	8.1.1	End-connectors - Solvent weld - Dimensions	AS/NZS 1462.1	At any change in design/Specifications
	8.1.2	End connectors-Elastomeric seal	AS/NZS 1462.1	
	8.2	General dimensions	AS/NZS 1462.1	
	8.3	Freedom from defects	Visual/Physical examination	
	8.4.1	Intermediate joints-Protection barrier	Review against documentation/Physical examination	
	8.4.2	Intermediate joint-Expansion joints-End stop	Review against documentation/Physical examination	
Performance	9.2	Elastomeric joints – Contact width and pressure	AS/NZS 1462.13	At any change in design/Specifications
	9.3	Hydrostatic pressure test	AS/NZS 1462.8	
	9.4	Liquid infiltration test	AS/NZS 1462.8	
	9.5	High-pressure stress-relief test (injection-moulded fittings – PVC-U/ABS/ASA)	AS/NZS 1462.11	
Product documentation	11	Product data/installation instructions	Documentation review	Any factor that requires 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 test of supplier's test data	Each delivery batch
Marking	6	Marking	Visual examination	100%
Design	8.1.1	End-connectors - Solvent weld	AS/NZS 1462.1	Once per batch
	8.1.2	End connectors- Elastomeric seal	AS/NZS 1462.1	
	8.3	Freedom from defects	Visual Inspection	One per cavity per hour
	9.4	High pressure stress-relief test (injection-moulded fittings – PVC-U)	AS/NZS 1462.11	One per cavity per production shift

TABLE A3
MINIMUM ANNUAL INSPECTION REQUIREMENTS

Characteristic	Clause	Requirement	Verification method
Design	8.1-8.4	General design/construction	Visual and dimensional examination
Product marking	6	Product marking, use of the WaterMark logo and licence number	Visual inspection of marked product, relevant packaging and documentation
Product documentation	11	Product data/Installation instructions	Product documentation review

TABLE A4
RE-EVALUATION TESTING

Characteristic	Clause	Requirement	Test method
Performance	9.2	Hydrostatic pressure test	AS/NZS 1462.8