



WATER SERVICES
ASSOCIATION OF AUSTRALIA

INDUSTRY STANDARD

FOR TAPPING FERRULES

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ABOUT WSAA

The Water Services Association of Australia (WSAA) is the peak industry body representing the urban water industry. Our members provide water and sewerage services to over 24 million customers in Australia and New Zealand and many of Australia's largest industrial and commercial enterprises.

ACKNOWLEDGEMENT OF COUNTRY

The Water Services Association of Australia acknowledges and pays respect to the past, present and future Traditional Custodians and Elders of this nation. We recognise their continuing connection to land and waters and thank them for protecting our waterways and environment since time immemorial.

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PREFACE

This Standard was prepared by the Water Services Association of Australia (WSAA).

The objective of this Standard is to provide a specification for tapping ferrules commonly utilized in water supply pipelines.

This Standard will be withdrawn upon publication of an equivalent Australian Standard.

WSAA welcomes suggestions for improvements and encourages users to notify us immediately of any apparent inaccuracies or ambiguities. Users may use the feedback link on the side menu of this Standard to submit comments or suggested improvements. Alternatively, you can also contact us via email at codes@wsaa.asn.au, or write to the National Codes Manager, Suite 8.02, Level 8, 401 Docklands Drive, Docklands, 3008.

To increase the likelihood of suggested amendments being adopted, it is recommended that users seek preliminary review by and support of a WSAA Member or other relevant organisation, for example, CSIRO, Civil Contractors Federation or PIPA for inclusion with the submission.

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1 SCOPE AND GENERAL

1.1 SCOPE

This Standard specifies requirements for PN 16 standard tapping ferrules and pressure tapping ferrules (TPFNR) in sizes DN 20, DN 25, DN 32, DN 40 and DN 50 that may be utilised with mechanical tapping bands to facilitate connection of house services to watermains.

Standard tapping ferrules are suitable for dry tapping applications and provide a means for isolating flow at the tapping point.

Pressure tapping ferrules incorporate an isolating tapered plug or ball valve to facilitate tapping into a live main. A means for isolating flow at the tapping point is also provided.

Both ferrule types have a clockwise closing rising stem and incorporate a jumper valve device to prevent backflow of water where loss of pressure in the main is encountered.

Both ferrule types may also be supplied with a cap to replace the bonnet assembly containing the flow isolation facility.

Means for demonstrating compliance with this Standard are given in Appendix A.

Purchasing guidelines are given in Appendix B.

1.2 REFERENCED DOCUMENTS

AS

- 681.1 Elastomeric seals—Material requirements for pipe joints used in water and drainage applications Part 1: Vulcanized rubber
- 2345 Dezincification resistance of copper alloys
- 1646 Elastomeric seals for waterworks purposes
- 1722.2 Pipe threads of Whitworth form Part 2: Fastening pipe threads
- 3688 Water supply and gas systems – Metallic fittings and end connectors
- 4796 Water supply – Metal bodied and plastic bodied ball valves for property service connection

AS/NZS

- 1462.6 Methods of test for plastics pipe and fittings Method 6: Thermoplastics pipes, fittings and assemblies for the transport of fluids under pressure – Resistance to internal pressure
- 3718 Water supply – Tap Ware
- 4020 Testing of products for use in contact with drinking water
- 4129 Fittings for (PE) polyethylene pipes for pressure applications

AS/ISO

- 7.1 Pipe threads where pressure-tight joints are made on the threads Part 1: Dimensions, tolerances and designation

ISO/IEC

- 17025 General requirements for competence of testing and calibration laboratories

ISO

6597 Copper alloys – Ammonia test for stress corrosion resistance

NSF/ANSI

372 Drinking water system components – Lead content

1.3 DEFINITIONS

For the purpose of this Standard the definitions given in AS/NZS 3718 and those below apply.

1.3.1 allowable operating pressure

AOP

Allowable internal pressure, excluding surge, that a component can safely withstand in service

1.3.2 allowable site test pressure

ASTP

Maximum pressure applied on site in a newly installed pipeline, which includes a safety factor and allowances for surge

1.3.3 ferrule

A pipe fitting for connecting a service pipe to a water main

1.3.4 maximum allowable operating pressure

MAOP

Maximum internal pressure, including surge, that a component can safely withstand in service

1.3.5 service pipe

A pipe that supplies water from a reticulation main to the household.

1.3.6 TPFNR

Tapping, pressure ferrule, non-return

2 MATERIAL REQUIREMENTS

2.1 GENERAL

Basic material requirements for the manufacture of tapping ferrule components are given in Table 1 and Clause 2.2.

Alternative materials are allowable provided they are equivalent in performance and corrosion resistance.

TABLE 1 BASIC MATERIAL REQUIREMENTS

Component	Material
Body, bonnet, spindle, jumper valve	Copper alloy
Tapered plug	Copper alloy or Polymer
Ball	Stainless steel
O-rings	Synthetic rubber
Seals	Synthetic rubber or Polymer
Fasteners	Copper alloy or Stainless steel

2.2 CORROSION-RESISTANT MATERIALS

Components manufactured from the following materials shall be deemed to be acceptable.

- (a) Copper alloys with a minimum 56% copper and a maximum of 0.25% arsenic that conform to any relevant recognised Standard. Copper alloy components shall –
 - (i) be dezincification resistant in accordance with AS 2345; and
 - (ii) where manufactured using a final cold working process, be stress corrosion resistant when tested in accordance with ISO 6957 using a test solution of pH-value 9.5 without pickling.
- (b) Stainless steel with a PREN of at least 22 that conforms to any relevant recognised standard for the relevant product form.

NOTE: Product forms may include castings, bars or forgings

- (c) EPDM, NBR or SBR synthetic rubbers shall comply with AS 1646 and AS 681.1
- (d) Polymer composites agreed between purchaser and supplier

2.3 CONTAMINATION OF WATER

Tapping ferrules shall comply with the requirements of AS/NZS 4020. A scaling factor of 0.01 shall be applied.

2.4 ALLOWABLE PRESSURES

Allowable pressures for tapping ferrules shall be as given in Table 2.

TABLE 2 ALLOWABLE PRESSURES

Component	PN	Allowable operating pressure (AOP) MPa	Maximum allowable operating pressure (MAOP) MPa	Allowable site test pressure (ASTP) MPa
Tapping ferrules	16	1.6	1.92	2.0

3 DESIGN

3.1 WALL THICKNESS

The wall thickness of all metal components, excluding the depth of any screw thread or coating material, shall comply with Table 3.

TABLE 3 MINIMUM WALL THICKNESS

DN	Minimum Wall Thickness mm
20	1.9
25	2.3
32	2.3
40	2.9
50	2.9

3.2 HEIGHT

The maximum height of any size tapping ferrule, in the open position, shall be 330mm.

3.3 JUMPER VALVES

Jumper valves shall comply with the dimensions given in AS 3718 Figure M10.

3.4 SPINDLE CAP DIMENSIONS

Where a bonnet assembly is fitted to the body, the critical dimensions of the spindle cap shall comply with Figure 1.

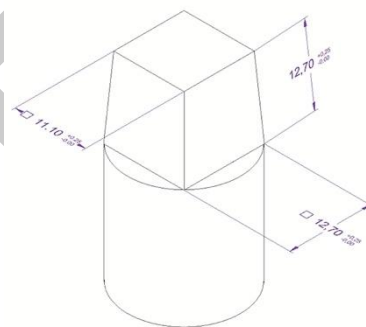


FIGURE 1 SPINDLE CAP DIMENSIONS

3.5 FERRULE BENDS

Ferrule bends shall be 90° with an female inlet fastening thread complying with AS 1722.2 Series G. Optional outlet connections are given in 4.7.4.

3.6 ISOLATION MECHANISM FOR LIVE TAPPING

Isolation to facilitate live tappings may be provided by a tapered plug or ball valve mechanism. Tapered plug design is the responsibility of the manufacturer. Ball valve mechanisms shall comply with AS 4796.

3.7 CONNECTIONS

3.7.1 Inlet connections

The inlet connections shall have male tapered threads complying with AS ISO 7.1 Series R.

3.7.2 Body to bonnet connections

The threaded connections shall have fastening threads complying with AS 1722.2 Series G.

3.7.3 Outlet connections for ferrules

Options for outlet connections are:

- (a) Fastening male thread complying with AS 1722.2 Series GB (to facilitate the connection of a ferrule bend)
- (b) PE compatible mechanical compression joint complying with AS/NZS 4129.

3.7.4 Outlet connections for ferrule bends

Options for ferrule bend outlet connections are:

- (a) Male tapered thread complying with AS ISO 7.1 Series R
- (b) PE compatible mechanical compression joint complying with AS/NZS 4129
- (c) Copper compatible compression joint complying with AS 3688
- (d) Copper compatible capillary joint complying with AS 3688

4 PERFORMANCE TESTS

4.1 TYPE TESTS

4.1.1 General

Type tests shall be carried out at ambient temperature for each configuration and nominal size tapping ferrule.

4.1.2 Seal hydrostatic leaktightness test

Tapping ferrules fitted with a flow isolation mechanism shall be hydrostatically tested at 1.76MPa for 15 m, with the mechanism closed, in accordance with the principles of AS/NZS 1462.6. There shall be no leakage.

4.1.3 Body strength test

Tapping ferrules shall be hydrostatically tested at 3.2MPa for 15m in accordance with the principles of AS/NZS 1462.6. Where a flow isolation mechanism is fitted it shall be in the open position. There shall be no permanent distortion, splitting, cracking, breakage or other failure.

4.1.4 Torque test for flow isolation operating mechanism

Tapping ferrules fitted with a flow isolation mechanism shall be tested in accordance with the principles of AS 3718 Appendix I with applied torques as given in Table 4. There shall be no permanent distortion, splitting, cracking, breakage or other failure.

TABLE 4 APPLIED TEST TORQUES

DN	Applied Torque Nm
20	15
25	20
32	25
40	35
50	40

5 BATCH RELEASE TESTS

5.1.1 Seal hydrostatic leaktightness test

Tapping ferrules fitted with a flow isolation mechanism shall be hydrostatically tested at 1.76MPa for a minimum of 25 s, with the mechanism closed, in accordance with the principles of AS/NZS 1462.6. There shall be no leakage.

5.1.2 Body leaktightness test

Tapping ferrules shall be hydrostatically tested at 2.4MPa for a minimum of 25 s in accordance with the principles of AS/NZS 1462.6. Where a flow isolation mechanism is fitted it shall be in the open position. There shall be no leakage.

6 MARKING

The following information shall be legibly marked on the tapping ferrule body:

- (a) Manufacturers name or mark
- (b) Nominal size
- (c) Pressure classification, PN16
- (d) The letters DR to designate Dezincification Resistant
- (e) The number of this Standard, WSA 134

APPENDIX A
MEANS FOR DEMONSTRATING CONFORMITY WITH THIS STANDARD
(Normative)

A1 SCOPE

This Appendix sets out the following ways that product conformance to this Standard can be demonstrated.

- (a) initial type testing
- (b) a sampling and testing frequency plan.

A2 RELEVANCE

The long-term performance of pipeline systems is critical to the operating efficiency of water agencies in terms of operating licences and customer contracts.

A3 TESTING**A3.1 General**

Table A1 sets out the minimum sampling and testing frequency plan for a manufacturer to demonstrate conformity of product(s) to this Standard.

A3.2 Testing

Testing shall be conducted by a testing laboratory or facility accredited to ISO/IEC 17025.

A3.3 Retesting

In the event of a test failure, the products within the production batch shall be 100% tested and only those items found to conform may be claimed and/or marked as conforming with this Standard.

A4 PRODUCT CONFORMITY ASSESSMENT REQUIREMENTS

Water Services Association of Australia Technical Note (WSA TN-08) sets out additional product conformity assessment requirements.

**TABLE A1
MINIMUM SAMPLING AND TESTING FREQUENCY PLAN**

Characteristic	Clause	Requirement	Test method	Frequency
Type Tests				
Material requirements	2.1, 2.2	Materials	Review material parts lists and material test reports	At any change in materials
	2.3	Contamination of water	AS/NZS 4020	At any change in material or every 5 years, whichever occurs first
Design	3.1	Wall thickness		At any change in design
	3.2	Height		
	3.3	Jumper valves	AS 3718 Figure M10	
	3.4	Spindle cap dimensions		
	3.5	Ferrule bends (inlet thread)	AS 1722.2	
	3.6	Ball valve isolation mechanism for live tapping	AS 4796	
	3.7.1	Inlet connections	AS/ISO 7.1	
	3.7.2	Body to bonnet connections	AS 1722.2	
	3.7.3	Outlet connections for ferrules	AS 1722.2 AS/NZS 4129	
	3.7.4	Outlet connections for ferrule bends	AS ISO 7.1 AS/NZS 4129 AS 3688	
Performance	4.1.2	Seal hydrostatic leaktightness test	AS/NZS 1462.6	
	4.1.3	Body strength test		
	4.1.4	Torque test for flow isolation operating mechanism	AS 3718 App I	
Batch Release Tests				
	5.1.1	Seal hydrostatic leaktightness test	AS/NZS 1462.6	Each ferrule
	5.1.2	Body leaktightness test		
	6	Marking	Visual examination	One ferrule per production batch

APPENDIX B
PURCHASING GUIDELINES
(Informative)

B1 GENERAL

Standards are intended to define the technical provisions necessary for the supply of products included in the Standard but do not purport to contain all the necessary provisions of a supply contract. The purchaser is generally required to provide specific requirements or choose from nominated options. These are contractual matters to be agreed upon between the purchaser and the manufacturer.

This Appendix contains advice and recommendations for information to be supplied by the purchaser to the manufacturer at the time of enquiry or order. Its aim is to avoid misunderstanding and to result in the purchaser receiving satisfactory products and services.

B2 INFORMATION TO BE SUPPLIED BY THE PURCHASER

At the time of enquiry or when calling for tenders or quotations a purchaser should supply the following information:

- (a) Standard or TPFNR ferrule
- (b) Bonnet or cap configuration
- (c) Ferrule bend required
- (d) Outlet on ferrule
- (e) Outlet on ferrule bend



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