

**AS 4795.1—2011**

(Incorporating Amendments up to and including No. 2)



**STANDARDS**  
Australia



# Butterfly valves for waterworks purposes

## Part 1: Wafer and lugged



AS 4795.1—2011

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- Australian Chamber of Commerce and Industry
- Australian Industry Group
- Australian Stainless Steel Development Association
- Australian Water Association
- Engineers Australia
- Institute of Instrumentation, Control and Automation Australia Inc.
- Master Plumbers Australia
- Plastics Industry Pipe Association of Australia
- Plumbing Products Industry Group
- Water Corporation Western Australia
- Water Industry Alliance
- Water New Zealand
- Water Services Association of Australia

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# Butterfly valves for waterworks purposes

## Part 1: Wafer and lugged

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## Preface

This Standard was prepared by the Joints Standards Australia/Standards New Zealand Committee WS-022, Valves for Waterworks Purposes, to supersede, in part, AS 4795—2006.

**A2** This Standard incorporates Amendment No. 2 (November 2021). The start and end of changes introduced by the Amendment are indicated in the text by tags including the amendment number 2. Amendment No. 2 replaces Amendment No. 1, which is withdrawn. **A2**

After consultation with stakeholders in both countries, Standards Australia and Standards New Zealand decided to develop this Standard as an Australian Standard rather than an Australian/New Zealand Standard.

The objective of this Standard is to provide material requirements and performance tests for wafer and tapped lugged butterfly valves for use in water supply plants, including drinking water, recycled water and screened wastewater systems, together with default compliance requirements for the use of manufacturers and conformity assessment bodies.

Support and contribution is acknowledged from the Water Services Association of Australia (WSAA) and manufacturers.

The terms “normative” and “informative” have been used in this Standard to define the application of the appendix to which they apply. A “normative” appendix is an integral part of a Standard, whereas an “informative” appendix is only for information and guidance.

Statements expressed in mandatory terms in notes to tables and figures are deemed to be requirements of this Standard.

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# Australian Standard®

## Butterfly valves for waterworks purposes

### Part 1: Wafer and lugged

## 1 Scope and general

### 1.1 Scope

This Standard specifies requirements for PN 10 and PN 16, manually operated, resilient-seated, seal-on-body wafer and tapped lugged butterfly valves in the size range of DN 50 to DN 600 for waterworks purposes, with a maximum operating temperature of 40°C.

This Standard covers the following:

- (a) Manual actuators, gearboxes and standard spindle caps.
- (b) Water supply applications that include drinking and recycled water.
- (c) Sewerage applications limited to screened sewage.
- (d) The capability of the valves to be fitted with electric, hydraulic or pneumatic actuators.

NOTE 1 Purchasing requirements that should be agreed upon at time of inquiry or order are given in [Appendix B](#).

NOTE 2 Double flanged valves for buried service are covered in AS 4795.2

### 1.2 Product conformity evaluation to the standard

Product conformity to this Australian Standard shall be evaluated in accordance with [Appendix A](#). 

### 1.3 Normative references

The following are the normative documents referenced in this Standard.

NOTE Documents referenced for informative purposes are listed in the Bibliography

AS 681.1, *Elastomeric seals—Material requirements for pipe joint seals used in water and drainage applications, Part 1: Vulcanized rubber*

AS 1111.1, *ISO metric hexagon commercial bolts and screws—Product grade C, Part 1: Bolts*

AS 1111.2, *ISO metric hexagon commercial bolts and screws—Product grade C, Part 2: Screws*

AS 1112.3, *ISO metric hexagon nuts, Part 3: Product grade C*

AS 1214, *Hot-dip galvanized coatings on threaded fasteners (ISO metric coarse thread series)*

AS 1565, *Copper and copper alloys—Ingots and castings*

AS 1627.0, *Metal finishing, Part 0: Preparation and pretreatment of surfaces—Method selection guide*

AS 1627.4, *Metal finishing, Part 4: Preparation and pretreatment of surfaces—Abrasive blast cleaning of steel*

AS 1646, *Elastomeric seals for waterworks purposes*

AS 1683.15.1, *Methods of test for elastomers, Method 15.1: International rubber hardness*

AS 1831, *Ductile cast iron*

AS 2345, *Dezincification resistance of copper alloys*

AS 3894.3, *Site testing of protective coatings, Part 3: Determination of dry film thickness*

AS 3894.4, *Site testing of protective coatings, Part 4: Assessment of degree of cure*

AS 4087, *Metallic flanges for waterworks purposes*

AS/NZS 1567, *Copper and copper alloys—Wrought rods, bars and sections*

AS/NZS 1568, *Copper and copper alloys—Forging stock and forgings*

AS/NZS 4020, *Testing of products for use in contact with drinking water*

AS/NZS 4158, *Thermal-bonded polymeric coatings on valves and fittings for water industry purposes*

AS ISO/IEC 17025, *General requirements for the competence of testing and calibration laboratories*

ISO 1083, *Spheroidal graphite cast irons — Classification*

ISO 5752, *Metal valves for use in flanged pipe systems—Face-to-face and centre-to-face dimensions*

ASTM A182/A182M-10a, *Standard Specification for Forged or Rolled Alloy and Stainless Steel Pipe Flanges, Forged Fittings, and Valves and Parts for High-Temperature Service*

ASTM A276-10, *Standard Specification for Stainless Steel Bars and Shapes*

ASTM B164-03, *Standard Specification for Nickel-Copper Alloy Rod, Bar, and Wire*

ASTM B439-08, *Standard Specification for Iron-Base Powder Metallurgy (PM) Bearings (Oil Impregnated)*

ASTM B455-10, *Standard Specification for Copper-Zinc-Lead Alloy (Leaded-Brass)*

ASTM D6778-06, *Standard Classification for Polyoxymethylene (POM, Acetal) Molding and Extrusion Materials*

BS 5292, *Specification for jointing materials and compounds for installations using water, low pressure steam or 1st, 2nd and 3rd family gases*

EN 558, *Industrial Valves—Face-to-face And Centre-to-face Dimensions Of Metal Valves For Use In Flanged Pipe Systems—P and Class Designated Valves*

EN 12164, *Copper and Copper Alloys—Rod For Free Machining Purposes*

EN 12165, *Copper And Copper Alloys—Wrought And Unwrought Forging Stocks*

SA HB 18.28, *Conformity assessment, Part 28: Guidance on a third-party certification system for products*

## 1.4 Terms and definitions

### 1.4.1

#### **allowable operating pressure**

##### **AOP**

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

### 1.4.2

#### **allowable site test pressure**

##### **ASTP**

maximum internal hydrostatic pressure that can be applied on site to a component in a newly installed pipeline

**1.4.3****batch release test****BRT**

test performed by the manufacturer on a production batch, which has to be satisfactorily completed before the batch can be released

**1.4.4****bonded**

glued or adhered

**1.4.5****bulkhead test**

test where the testing machine provides external restraint to make a watertight joint at each end of the valve

**1.4.6****disc clearance dimension**

dimension equivalent to the minimum internal diameter of the adjacent pipe or flange, which will allow the disc to fully open without interference or damage to the disc sealing edge

**1.4.7****free-end seat test**

test where one side of the valve is pressurized with the disc in the closed position and the other side is unrestrained so that the valve liner is not externally compressed on the downstream end, which simulates a valve in a terminal position fastened at the upstream end only

**1.4.8****lot**

clearly identifiable subdivision of a batch for inspection purposes

**1.4.9****maximum allowable operating pressure****MAOP**

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

Note 1 to entry: Note 1 to entry: Seat leakage may occur at this pressure; however structural damage should not occur.

**1.4.10****nominal size****DN**

alphanumeric designation of size for components of a pipework system, which is used for reference purposes. It comprises the letters DN followed by a dimensionless whole number, which is indirectly related to the physical size, in millimetres, of the bore, or outside diameter of the end connections

**1.4.11****pitting resistance equivalent number****PREN**

1. for ferritic and martensitic stainless steel grades,  $PREN = Cr + 3.3 (\%Mo)$  where the concentrations are in weight (%).

2. for austenitic and duplex stainless steel grades,  $PREN = \%Cr + 3.3 (\%Mo) + x(\%N)$  where—

$x = 16$  for duplex stainless steels; and

$x = 30$  for austenitic stainless steels

**1.4.12****production batch**

**A2** schedule of products of the same type, nominal diameter and dimensional characteristics manufactured from the same material

Note 1 to entry: Note 1 to entry: The production batch is defined by the manufacturer. **A2**

**1.4.13****pressure class****PN**

classification of valves by a PN number, based on the allowable operating pressure (AOP), expressed in hundreds of kilopascals

**1.4.14**

**A2** [Text deleted] **A2**

**1.4.15****sample**

one or more units of product drawn from a batch or lot, selected at random without regard to quality

Note 1 to entry: The number of units of product in the sample is the sample size.

**1.4.16****sampling plan**

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

**1.4.17****seal-on-body**

seal that encapsulates the wetted part of the body, which is also an integral part of the flange face, replacing the need for a gasket

**1.4.18****type test**

**A2** test or series of tests directed towards approval of a design, conducted to determine if an item is capable of meeting the requirements of the product Standard and which is done once and repeated only after a change in design, materials, method or place of manufacture or as otherwise nominated in the product Standard **A2**

**1.4.19**

**A2** [Text deleted] **A2**

**1.4.20****vulcanize**

to adhere the seal to the body by application of high temperature and the use of an agent

**1.5 Designation of size**

Valve size shall be designated by nominal sizes DN 50, DN 65, DN 80, DN 100, DN 125, DN 150, DN 200, DN 250, DN 300, DN 350, DN 400, DN 450, DN 500, and DN 600.

**1.6 Allowable operating pressures**

The allowable operating pressures (AOPs) shall be as given in [Table 1.1](#). The allowable site test pressure (ASTP) shall be only applied with the disc in the fully open position.

**Table 1.1 — Classification and rating**

| PN                                                                               | AOP  | MAOP | ASTP | Maximum flow velocity<br>m/s |           |
|----------------------------------------------------------------------------------|------|------|------|------------------------------|-----------|
|                                                                                  | kPa  | kPa  | kPa  | Rated                        | Emergency |
| 10                                                                               | 1000 | 1200 | 1250 | 5                            | 7.5       |
| 16                                                                               | 1600 | 1920 | 2000 | 5                            | 7.5       |
| NOTE Seat leakage may occur at MAOP; however structural damage should not occur. |      |      |      |                              |           |

## 2 Materials and components

### 2.1 General

**A2** The basic materials for the manufacture of valve components shall be as given in [Table 2.1](#). Alternative materials may be used, provided they are equivalent in performance and corrosion resistance.

Non-metallic materials used in the componentry of valves shall be fit for the intended purpose and shall exhibit dimensional stability after extended periods of time immersed in water and wastewater.

NOTE For information on material equivalence, consult the Water Services Association of Australia (WSAA). **A2**

### 2.2 Corrosion-resistant materials

For the purposes of this Standard, the following materials are deemed to be corrosion resistant:

- (a) Copper alloys complying with AS 1565, AS/NZS 1567 or AS/NZS 1568 and complying with AS 2345.
- (b) Stainless steels with a PREN of at least 22 complying with a recognized Standard (e.g. ASTM, EN, etc.) for the relevant product form (e.g. casting, bar, forging).

### 2.3 Contamination of water

Valves shall comply with the requirements of AS/NZS 4020. A scaling factor of **A2** 0.01 **A2** shall be applied.

### 2.4 Elastomeric components

Elastomeric components (e.g. liner, seals, O-rings, etc.) shall be made of a compound, with or without reinforcement, that is not injuriously affected by the fluid, temperature or environmental conditions to which the component will be subjected in service. Elastomeric components shall exhibit dimensional stability after extended periods of time immersed in drinking water and recycled water and shall be suitable for the nominated purpose.

Reinforcement shall be of the non-wicking type. Components shall be manufactured from an elastomer that complies with AS 1646 and AS 681.1. The physical properties of the elastomeric material shall be selected by the valve manufacturer to suit particular applications (e.g. quick response, low flow stability, etc.) and to optimize performance and endurance under operating conditions.