

Australian/New Zealand Standard™

Polybutylene (PB) plumbing pipe systems

Part 3: Mechanical jointing fittings for use with polybutylene (PB) pipes for hot and cold water applications



AS/NZS 2642.3:2008

This Joint Australian/New Zealand Standard was prepared by Joint Technical Committee PL-006, Polyolefin Pipe Systems. It was approved on behalf of the Council of Standards Australia on 31 January 2008 and on behalf of the Council of Standards New Zealand on 22 February 2008.
This Standard was published on 17 March 2008.

The following are represented on Committee PL-006:

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This Standard was issued in draft form for comment as DR 07339.

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Originated as AS 2642.3—1983.
Previous edition AS/NZS 2642.3:1994.
Third edition 2008.
Reissued incorporating Amendment No. 1 (November 2018).

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Jointly published by SAI Global Limited under licence from Standards Australia Limited, GPO Box 476, Sydney, NSW 2001 and by Standards New Zealand, PO Box 1473, Wellington 6140.

ISBN 0 7337 8590 5

PREFACE

This Standard was prepared by the Joint Australian/New Zealand Standards Committee PL-006, Polyolefin Pipe Systems, to supersede AS/NZS 2642.3:1994, *Polybutylene pipe systems, Part 3: Mechanical jointing fittings for use with polybutylene (PB) pipes for hot and cold water applications*. The Standard is Part 3 of a series of polybutylene pipe system Standards; other Standards in the series are as follows:

AS/NZS

2642 Polybutylene (PB) plumbing pipe systems

2642.1 Part 1: Polybutylene (PB) pipe extrusion compounds

2642.2 Part 2: Polybutylene (PB) pipe for hot and cold water applications

This Standard incorporates Amendment No. 1 (November 2018). The changes required by the Amendment are indicated in the text by a marginal bar and amendment number against the clause, note, table, figure or part thereof affected.

The objective of this Standard is to provide manufacturers and purchasers with a standard specification for mechanical jointing fittings suitable for use as fixed joints with polybutylene plumbing pipes manufactured in accordance with AS/NZS 2642.2.

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

The term ‘normative’ has been used in this Standard to define the application of the appendix to which it applies. A ‘normative’ appendix is an integral part of a Standard.

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1 SCOPE

This Standard specifies requirements for mechanical jointing fittings suitable for use as fixed joints with polybutylene plumbing pipes manufactured in accordance with AS/NZS 2642.2.

2 APPLICATION

Means for demonstrating compliance with this Standard shall be in accordance with Appendix A.

3 REFERENCED DOCUMENTS

The following documents are referred to in this Standard:

AS

- 1199 Sampling procedures for inspection by attributes
- 1199.1 Part 1: Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection
- 1349 Bourdon tube pressure and vacuum gauges
- 2345 Dezincification resistance of copper alloys
- 3688 Water supply—Metallic fittings and end connectors
- HB 18.28 Conformity assessment—Guidance on a third-party certification system for products

A1

AS ISO/IEC

- 17025 General requirements for the competence of testing and calibration laboratories

AS/NZS

- 1462 Methods of test for plastics pipes and fittings
- 1462.6 Method 6: Method for hydrostatic pressure testing of pipes
- 2642 Polybutylene (PB) plumbing pipe systems
- 2642.1 Part 1: Polybutylene (PB) pipe extrusion compounds
- 2642.2 Part 2: Polybutylene (PB) pipe for hot and cold water applications
- 3500 Plumbing and drainage
- 3500.0 Part 0: Glossary of terms
- 3707 Method for testing pressure cycling resistance of pipes and fittings
- 4020 Testing of products for use in contact with drinking water
- 4131 Polyethylene (PE) compounds for pressure pipes and fittings

SANZ

- HB 18.28 Guide 28: General rules for a model third-party certification system for products

4 DEFINITIONS

For the purpose of this Standard, the definitions in AS/NZS 2642.1 and AS/NZS 3500.0 apply.

5 CLASSIFICATION

Insert-type fittings shall be classified according to their nominal working pressure (PN) at 20°C; namely, PN 16, for use with pipe complying with AS/NZS 2642.2. Other fittings shall be classified by the maximum allowable operating pressure class for which they are suitable.

6 PRESSURE RATING ACCORDING TO PIPE MATERIAL TEMPERATURE

The working pressure of polybutylene plumbing pipe according to pipe material temperature, is given in Table 1, in order that the appropriate pressure for a particular class of pipe can be used in the testing of fittings for compliance with this Standard.

7 SIZE AND TYPE

Where fittings are required to connect PB pipes with pipes of other materials, the method of specifying the size and type of fittings shall be in accordance with Appendix B.

TABLE 1
PRESSURE RATING OF PIPE

Class	Working pressure, MPa					
	Temperature, °C					
	20	40	60	70	80 (25 y)	95 (10 y)
16	1.60	1.37	1.05	0.88	0.74	0.49

NOTES:

- 1 Manufacturer's recommendations should be sought for applications of PB pipe involving continuous use at temperatures above 60°C.
- 2 1.6 MPa = 1.6 Bar = PN 16.

8 COMPOSITION

8.1 General

Fittings shall be manufactured from materials which are compatible with the pipe material. The composition of all materials used shall comply with the relevant Standard, where applicable.

NOTE: Fittings should have design pressure and temperature ratings equal to or greater than those designated for the equivalent size and class of polybutylene pipe. (Refer to manufacturer's literature.)

8.2 Dezincification resistance

Copper alloy parts in contact with water shall comply with AS 2345.

9 TOXICITY AND EFFECT ON WATER

Components of fittings in contact with potable water shall comply with the requirements of AS/NZS 4020.

10 FREEDOM FROM DEFECTS

10.1 General

The defects described in this Clause cannot be completely quantified. Where the presence, size or frequency of any defects are considered to be of concern, arrangements should be made between the purchaser/water authority/certifying body (as appropriate), and the manufacturer. This may be achieved by the provision of acceptable type samples or methods of test.

Where the presence, size or frequency of any imperfection is considered to be of concern, the manufacturer should be able to demonstrate fitness for purpose of the products.

10.2 Requirements

10.2.1 *General requirements*

The fitting shall be clean, smooth and free from burrs, fins, irregularities and sharp edges that could affect the performance or function of the fitting in service and the safe handling of the fitting during installation and use. There shall be no imperfections that will score the pipe or cause damage to other fittings.

The bore of fittings shall be free from irregularities which may restrict the free flow of fluids.

10.2.2 *Requirements specific to plastic materials*

The surfaces of plastic components shall be free from grooves, pinholes, blisters, heat marks or other imperfections that would affect the performance or function of the fitting in service.

NOTE: For the purposes of this Standard, the term 'plastic' includes elastomers.

10.2.3 *Requirements specific to metallic materials*

Fittings made from metallic materials shall be sound and free from folds, laps, blisters, laminations, blow holes and other imperfections that could affect the performance or function of the fittings in service. Copper and copper alloy fittings shall comply with the workmanship and finish requirements of AS 3688.

Pitting shall not be present on sealing faces or thread faces. Pitting shall be permissible in other locations, provided the minimum wall thicknesses given in the manufacturer's specification are maintained, and the pits will not affect the performance and function of the fitting in service.

No components shall be burned, plugged, stopped or patched.

11 FASTENING

Fitting ends required to connect to pipes or fittings of other materials shall comply with the appropriate Standard that applies to the connection.

When a torque of 30 ± 2 N.m is applied, all threaded ends and components of the fitting shall be capable of being tightened without damage to the fitting or jumping or stripping of the threads.

NOTE: Where threads on fittings comply with the dimensional requirements of the appropriate Australian Standards, the torque test is not required.

Fitting ends required to join polybutylene pipe to the fitting shall comply with Clause 11 of this Standard.

12 PERFORMANCE REQUIREMENTS

12.1 Selection of class of pipe

All polybutylene pipe used in testing of fittings shall comply with AS/NZS 2642.2.

All test joint assemblies shall be made in accordance with the fitting manufacturer's instructions. The geometry of fittings under test shall be selected at the maximum and minimum extremes of dimensional tolerance. Selection of fittings to be type-tested shall be performed to test 'worst case' joint assemblies.

12.2 Test requirements

12.2.1 *Compatibility of fittings with pipe*

When tested in accordance with AS/NZS 1462.6, fittings shall withstand internal pressures equivalent to both a nominal hoop stress in the pipe of 5.5 MPa at a temperature of $95 \pm 1^\circ\text{C}$ for 3000 h, and a nominal hoop stress in the pipe of 14.7 MPa at a temperature of $20 \pm 5^\circ\text{C}$ for 170 +24, -0 h. Conditioning and preconditioning of the samples shall be in accordance with Clause 10.2 of AS/NZS 2642.2.

12.2.2 *Resistance to leakage when subjected to bending*

When determined in accordance with Appendix C, the resistance to leakage of an assembled joint when subjected to bending shall be such that there is no leakage in the joint.

12.2.3 *Resistance to pull-out of assembled joints*

When determined in accordance with Appendix D, the resistance to pull-out of an assembled joint shall be such that the pipe shall not separate from the fitting.

12.2.4 *Thermal cycling test*

When determined in accordance with Appendix E, the resistance to thermal cycling of an assembled joint or fitting shall be such that there is no leakage in the joint or fitting.

12.2.5 *Liquid infiltration*

When determined in accordance with Appendix F, the resistance to liquid infiltration of an assembled joint or fitting shall be such that there shall be no leakage in the joint or fitting.

12.2.6 *Pressure cycling test*

When determined in accordance with AS/NZS 3707 at a pressure equivalent to the working pressure at 95°C in a test environment maintained at $95 \pm 1^\circ\text{C}$, the resistance to pressure cycling of an assembled joint shall be such that there shall be no leakage in the joint or fitting after 500 000 cycles.

NOTE: The ratio of 'on time' (i.e. rise and dwell times) to 'off time' (fall and dwell times) should be 1:1.

12.2.7 *Porosity test*

This requirement is applicable to metallic bodied fittings only. The bodies of fittings shall be capable of withstanding a pressure test which shall consist of either—

- (a) the application of an internal hydrostatic pressure of 2.0 ± 0.2 MPa for a minimum of 15 s; or
- (b) the application of an internal air pressure equal to $0.7 + 0.1, -0$ MPa for a minimum of 5 s while the fitting is completely immersed in water.