

# Australian Standard 2537—1982

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## MECHANICAL JOINTING FITTINGS FOR USE WITH CROSSLINKED POLYETHYLENE (XLPE) PIPES FOR HOT AND COLD WATER APPLICATIONS

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MECHANICAL JOINTING FITTINGS FOR USE WITH CROSS-  
LINKED POLYETHYLENE (XLPE) PIPES FOR HOT AND COLD  
WATER APPLICATIONS]



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Department of Housing and Construction  
Department of Local Government, Queensland  
Engineering and Water Supply Department, S.A.  
Federated Master Plumbers of Australia  
Hunter District Water Board  
Melbourne and Metropolitan Board of Works  
Metal Trades Industry Association of Australia  
Metropolitan Water Sewerage and Drainage Board, Sydney  
Plastics Institute of Australia Inc.

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AUSTRALIAN STANDARD

**MECHANICAL  
JOINTING FITTINGS  
FOR USE WITH  
CROSSLINKED  
POLYETHYLENE (XLPE) PIPES  
FOR HOT AND COLD  
WATER APPLICATIONS**

**AS 2537—1982**

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## PREFACE

This standard was prepared by the Association's Committee on Crosslinked Polyethylene (XLPE) Pipe under the authority of the Plastics Standards Board. It applies to mechanical jointing fittings intended for use with XLPE pipe complying with AS 2492.

The standard is based on AS 1460, Mechanical Jointing Fittings for Use with Polyethylene Pressure Pipes, but has been modified to cover criteria and testing of fittings for hot water applications. Hence, most testing is conducted at 95°C.

Significant changes from AS 1460 include the requirement that brass fitting components designed to be in contact with reticulated water be dezincification resistant and the adoption of the ISO 4059\* method for determining pressure loss through fittings. This has been found to give far more reproducible results than were previously obtained with the AS 1460 method.

A long-term test for assessing the compatibility of fittings with the pipe has also been included. This is for a period of approximately 1 year at an elevated temperature of 110°C and is intended to correlate with a service life of 50 years at 95°C.

With regard to the toxicity requirements in Clause 7, the committee has found that because the issues involved are so complex it is not possible to present a precise requirement. Approval of fittings on toxicological grounds for use with potable water is at the discretion of the relevant Statutory Authority, who may require consultation with the National Health and Medical Research Council (NHMRC).

This standard may require reference to the following standards:

AS 1199	Sampling Procedures and Tables for Inspection by Attributes
AS 1349	Bourdon Tube Pressure and Vacuum Gauges
AS 1399	Guide to AS 1199
AS 1460	Mechanical Jointing Fittings for use with Polyethylene Pressure Pipes
AS 1477	Unplasticized PVC (UPVC) Pipes and Fittings for Pressure Applications, Parts 1 to 6
AS 1585	Capillary and Brazing Fittings of Copper and Copper Alloy
AS 1590	Copper Alloy Threaded Pipe Fittings for use with Tubes Threaded with Pipe Threads of Whitworth Form
AS 1645	Copper and Copper Alloy Compression Fittings for use in Water Supply and Hot Water Services
AS 1722	Pipe Threads of Whitworth Form
AS 1821-1823	Suppliers Quality Control Systems
AS 2000	Guide to AS 1821-23, Suppliers Quality Control Systems
AS 2345	An Accelerated Laboratory Test Method for Assessment of the Susceptibility of Brass to Dezincification
AS 2492	Crosslinked Polyethylene (XLPE) Pipe for Hot and Cold Water Applications

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\*ISO 4059, Polyethylene (PE) Pipes—Pressure Drop in Mechanical Pipe-jointing Systems—Method of Test and Requirements.

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## CONTENTS

	<i>Page</i>
SPECIFICATION	
1 Scope .....	4
2 Definitions .....	4
3 Classification .....	4
4 Pressure Rating According to Temperature .....	4
5 Size and Type .....	4
6 Composition.....	4
7 Toxicity and Effect on Water.....	4
8 Freedom from Defects .....	4
9 Design .....	5
10 Fastening .....	5
11 Performance Requirements .....	5
12 Marking .....	5
APPENDICES	
A Determination of Compliance of a Lot .....	7
B Methods of Specifying Sizes and Types of Fittings .....	8
C Method for Determining Compatibility of Fittings with Pipe .....	10
D Method of Test for Pressure Loss Through Couplings .....	12
E Method of Test for Resistance to Leakage when Subjected to Bending	15
F Method of Test for Resistance to Pull-out of Assembled Joints .....	18
G Thermal Cycling Test .....	20
H Method for Test of Liquid Infiltration .....	21
J Pressure Cycling Test .....	22
K Method of Test for Resistance to Pressure .....	23
L Method of Test for Resistance to Leakage .....	25

## STANDARDS ASSOCIATION OF AUSTRALIA

## Australian Standard

for

**MECHANICAL JOINTING FITTINGS FOR USE WITH CROSSLINKED POLYETHYLENE (XLPE) PIPE FOR HOT AND COLD WATER APPLICATIONS**

**1 SCOPE.** This standard specifies requirements for mechanical jointing fittings suitable for use as fixed joints, with crosslinked polyethylene pipes manufactured in accordance with AS 2492.

**NOTES:**

1. Joining crosslinked polyethylene pipe by means of solvent cement or heat fusion is not satisfactory.
2. Advisory information on the determination of compliance of a 'lot' with this standard is given in Appendix A.

**2 DEFINITIONS.** For the purpose of this standard, the following definitions apply:

*Hoop stress*—the stress in a pipe under pressure acting tangentially to the perimeter of a transverse section.

*Ultimate hoop stress*—the stress in a pipe under pressure acting tangentially to the perimeter of a transverse section at which failure occurs at a specific time and a specific temperature.

*Hydrostatic design stress*—the particular hoop stress that is defined by the application of a safety factor to the value of the extrapolated 50-year ultimate hoop stress.

*Working pressure*—the maximum pressure than can be sustained by the type and class of pipe or fitting for its estimated useful life under the anticipated working conditions.

*Test pressure*—the pressure applied internally to pipes and fittings when being tested for strength and water tightness.

*Pipe material temperature*—the average temperature estimated as applying through the full wall thickness.

**3 CLASSIFICATION.** Insert type fittings shall be classified by their pressure class, viz classes 10, 16, 20, 25, 32 and 40 for fittings for use with pipe in accordance with AS 2492. Other fittings shall be classified as the maximum pressure class for which they are suitable.

**4 PRESSURE RATING ACCORDING TO TEMPERATURE.** The working pressure of cross-linked polyethylene 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 to carry out the fittings tests in this standard.

**5 SIZE AND TYPE.** The methods of specifying the sizes and types of fittings shall comply with Appendix B.

**6 COMPOSITION.** Fittings shall be manufactured from corrosion-resistant materials. The materials used shall be compatible with the pipe

**TABLE 1**  
**PRESSURE RATING OF PIPE**

Class	Working pressure, MPa					
	20°C	40°C	60°C	80°C	95°C	100°C
10	1.0	0.87	0.74	0.61	0.46	0.40
16	1.60	1.39	1.18	0.98	0.73	0.64
20	2.00	1.74	1.47	1.23	0.92	0.80
25	2.50	2.17	1.84	1.54	1.15	1.01
32	3.20	2.78	2.36	1.97	1.47	1.29
40	4.00	3.48	2.95	2.46	1.83	1.61

material. The composition of each material shall comply with a relevant Australian standard, where applicable.

Copper alloy fittings and components shall be dezincification resistant and, when tested in accordance with AS 2345, shall comply with the following relevant requirements:

- (a) *Sand cast alloys*—the average depth of dezincification shall not exceed 0.1 mm (100  $\mu$ m).
- (b) *Extruded bar*—the average depth of dezincification shall not exceed 0.3 mm (300  $\mu$ m) longitudinally and 0.1 mm (100  $\mu$ m) transversely.
- (c) *Forgings*—the average depth of dezincification shall not exceed 0.1 mm (100  $\mu$ m).

**7 TOXICITY AND EFFECT ON WATER.** The fitting shall not impart to water any taste, colour or odour, or any constituent in concentrations known to be hazardous to health.

**8 FREEDOM FROM DEFECTS.**

NOTE: The defects described in Clauses 8.1, 8.2 and 8.3 cannot be properly quantified. Where any of these are considered to be important, arrangements should be made between purchaser and supplier.

**8.1 Finish.** The fittings shall be cleanly and neatly finished and free from burrs or other defects likely to damage or score the pipe, and the bore shall be free from irregularities which may restrict the free flow of fluid.

**8.2 Plastics Materials.** The internal and external surfaces of any plastics materials assembled in or for fittings shall be clean and free from grooves, pinholes or other details likely to affect the performance and service of the systems.

**8.3 Metal or Alloy Materials.** Castings shall in all respects, be sound, free from laps, blowholes and pitting, and both the external and the internal surfaces shall be clean, smooth and free from sand. No casting