

Australian/New Zealand Standard™

**Ductile iron pipes and fittings**



## **AS/NZS 2280:2014**

This Joint Australian/New Zealand Standard was prepared by Joint Technical Committee WS-016, Cast Iron Pressure Pipes and Fittings. It was approved on behalf of the Council of Standards Australia on 13 August 2014 and by the New Zealand Standards Approval Board on 12 August 2014. This Standard was published on 16 September 2014.

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The following are represented on Committee WS-016:

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Casting Technology  
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Plastics Industry Pipe Association of Australia  
Plastics New Zealand  
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*This Standard was issued in draft form for comment as DR2 AS/NZS 2280.*

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# Australian/New Zealand Standard™

## Ductile iron pipes and fittings

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## PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee WS-016, Cast Iron Pressure Pipes and Fittings, to supersede AS/NZS 2280:2012.

*This Standard incorporates Amendment No. 1 (November 2015) and Amendment No. 2 (June 2017). 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 a standard manufacturing specification to be used by manufacturers and purchasers of ductile iron pressure pipes and fittings.

The major changes to this edition are as follows:

- (a) An increase in the minimum pipe wall thickness for pressure classifications above PN 20.
- (b) A change to the relationship between nominal and minimum pipe wall thickness.
- (c) A requirement that all fittings be marked with the pressure classification.
- (d) A revision of the pipe and fitting coating and lining requirements, including the mandatory application of a higher mass of zinc metal spray coating on pipe, the specification of the minimum coating thickness, and the allowance of alternative coatings and linings of polyurethane.
- (e) Inclusion of minimum depth of entry for ductile iron fitting sockets for use with plastics pipes in sizes DN 450 to DN 750.
- (f) Improvements to the type test requirements for DI pipe and fitting joints with DI pipes.
- (g) Inclusion of type tests for restrained joints.
- (h) A change to the requirement for limits of tolerance on pipe diameter.

Relevant Standards relating to the installation of ductile iron pipes and fittings are listed in the Bibliography.

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 as 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. Notes to text are for information and guidance only.

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## FOREWORD

This Standard sets out manufacturing requirements and dimensions for ductile iron pipes and fittings up to DN 750.

The class of ductile iron pipe has been determined on the basis of the allowable operating pressure (AOP) to give a minimum wall thickness. It provides a factor of safety of 3 on AOP, but does not include a separate corrosion allowance. Most users now consider the issue of corrosion to be best addressed by the consideration of appropriate protection systems.

This Standard permits a range of pressure classifications with two standard classifications of PN 20 and PN 35 for pipe, and PN 35 for fittings.

The AOP of a pipeline is limited to the lowest AOP of all pipes, fittings and appurtenances within the pipeline system.

Requirements for DN 900 to DN 2600 ductile pipes and fittings are given in ISO 2531, *Ductile iron pipes, fittings, accessories and their joints for water applications*.

Fittings covered by this Standard are intended primarily for use with water supply pressure pipes having outside diameters nominated herein.

Other factors to be considered in selecting the wall thickness of ductile iron pipes and fittings are as follows:

- (a) External loads that can be expected to be applied to pipes and fittings during and after installation.
- (b) The depth of the pipeline in the ground and other pipe-laying conditions.
- (c) Stresses due to expansion and contraction.
- (d) Stresses incurred during handling of pipes and fittings.

A designer of a pipeline has, among other duties, the responsibility of evaluating the possible conditions to which component pipes and fittings may be exposed. The designer has to consider whether pipes and fittings manufactured in accordance with this Standard are of sufficient strength for a proposed application.

Ductile iron pressure pipes and fittings with spigot and socket ends are manufactured for use with flexible joints in which the seal is made by means of a suitably retained rubber gasket. It is not possible to include complete details of such joints and joint surfaces without restricting future developments in their design.

Where pipeline designers are combining plastic pipes with fittings manufactured to this Standard, the following needs to be considered when assessing required minimum depth of pipe entry into fitting sockets:

- (i) Thermal expansion and contraction.
- (ii) Joint deflection.
- (iii) Viscoelasticity of pipeline material.
- (iv) Off-square pipe cuts and chamfer lengths.

Guidelines for the use of plastic pipes with ductile iron fittings specified within this Standard are given in the Water Services of Australia Information and Guidance Note WSAA TN2, *Guidelines for the use ductile iron elastomeric joint fittings with plastic pipes*, available from <https://www.wsaa.asn.au>.

Ductile iron pipelines can be subject to corrosion in some soils. The need for protection can be assessed by various methods, including the ANSI approved AWWA C105/A21.5, *Polyethylene Encasement for Ductile-Iron Pipe Systems*, and the Orstad Chart. The most accurate and commonly used method in Australia is the Linear Polarization Resistance (LPR) technique. Advice on assessment can be obtained from manufacturers of ductile iron pipeline systems.

Protection against corrosive soils is most commonly provided by loose polyethylene sleeving, manufactured to AS 3680, *Polyethylene sleeving for ductile iron piping*, applied in accordance with AS 3681, *Application of polyethylene sleeving for ductile iron piping*. This system of protection has been in use in Australia for over 40 years and has been shown to be a most cost-effective means of corrosion protection. Training in the use of loose polyethylene sleeving is recommended by ductile iron pipe manufacturers and has been accredited by the Australian Skills Quality Authority.

## STANDARDS AUSTRALIA/STANDARDS NEW ZEALAND

**Australian/New Zealand Standard**  
**Ductile iron pipes and fittings**

## SECTION 1 SCOPE AND GENERAL

**1.1 SCOPE**

This Standard specifies requirements for ductile iron pressure pipes centrifugally cast in moulds, and ductile iron fittings of nominal sizes up to and including DN 750.

NOTE: Ductile iron is also known as spheroidal graphite iron, SG iron or nodular graphite iron.

The specified pipes and fittings are intended primarily for conveying water under pressure, but may be used for conveying sewage or other liquids.

Fittings covered by this Standard are intended primarily for use with water supply pressure pipes.

## NOTES:

- 1 Fittings are also used in non-metallic pipeline systems.
- 2 Fittings may also be used with pressure pipes of alternative outside diameters by the adoption of compatible sockets or utilization of compensating elastomeric seals, provided the joint meets the performance requirements of this Standard. Ductile iron spigots should not be inserted into plastic pipe sockets.

This Standard specifies pressure classifications of pipe on the basis of the allowable operating pressure (AOP); however, Flange Class (FLCL) pipe has been specified for manufacture of flanged pipe with screw-on flanges.

**1.2 DEMONSTRATION OF COMPLIANCE WITH THIS STANDARD**

Compliance with this Standard shall be demonstrated in accordance with Appendix A.

NOTE: The information that should be supplied by the purchaser, or by the manufacturer, is given in the purchasing guidelines set out in Appendix B.

**1.3 NORMATIVE REFERENCES**

The following are the normative documents referenced in this Standard:

NOTE: Documents referenced for informative purposes and relevant Standards relating to the installation of ductile iron pipes and fittings are listed in the Bibliography.

## AS

1111	ISO metric hexagon commercial bolts and screws—Product grade C
1111.1	Part 1: Bolts
1290	Linear measuring instruments used in construction
1290.4	Part 4: Retractable steel pocket rules
1290.5	Part 5: Coated and etched steel measuring tapes
1349	Bourdon tube pressure and vacuum gauges
1391	Metallic materials—Tensile testing at ambient temperature
1580	Paints and related materials—Methods of test
1580.408.4	Method 408.4: Adhesion (crosscut)
1646	Elastomeric seals for waterworks purposes