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Amendment 1 - April 1989

Standards
Association of
Australia

Under revision see DR 90173

Australian Standard®
2280—1988

DUCTILE IRON PRESSURE PIPES AND FITTINGS

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This Australian Standard was prepared by Committee WS/16, Cast Iron Pressure Pipes and Fittings. It was approved on behalf of the Council of the Standards Association of Australia on 23 December 1987 and published on 7 March 1988.

The following interests are represented on Committee WS/16:

Brisbane City Council
Confederation of Australian Industry
Department of Administrative Services—Construction Group
Department of Local Government, Qld
Engineering and Water Supply Department, S.A.
Gas and Fuel Corporation of Victoria
Hunter District Water Board
Institution of Engineers, Australia
Melbourne and Metropolitan Board of Works
Metal Trades Industry Association of Australia
Plastics Institute of Australia
Public Works Department, N.S.W.
Rural Water Commission of Victoria
Water Authority of Western Australia
Water Board, N.S.W.

This Standard was issued in draft form for comment as DR 85141.

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STANDARDS AUSTRALIA

AMENDMENT No 1
to
AS 2280—1988
DUCTILE IRON PRESSURE PIPES AND FITTINGS

REVISED TEXT

The 1988 edition of AS 2280 is amended as follows; the amendment(s) should be inserted in the appropriate place.

SUMMARY: This Amendment applies to Clauses 5.1.1.2, 5.1.2.3, 6.2.1, 7.3, 7.3.1, 7.3.2, Figure 5.1 and Appendix G.

Published on 3 April 1989.

AMDT No 1 APR. 1989 **Page 11. Clause 5.1.1.2.**

Delete Clause 5.1.1.2 and *substitute*:

5.1.1.2 *Length.* The minimum effective spigot and socket pipe length shall be 5 m. The effective pipe length should be 5.5 m.

AMDT No 1 APR. 1989 **Page 11. Clause 5.1.2.3.**

Delete Clause 5.1.2.3 and *substitute*:

5.1.2.3 *Tolerance on length.* The tolerance on effective length shall be ±30 mm except for pipes which have had a test specimen cut from them as provided for in Clause 5.1.1.2. The tolerance on special cut pipe lengths shall be ±6 mm.

AMDT No 1 APR. 1989 **Page 11. Figure 5.1.**

Delete '(1.3 + 0.001 inside diameter)' and *substitute*:

'(1.3 + 0.001 nominal inside diameter) numbers rounded up'

AMDT No 1 APR. 1989 **Page 13. Clause 6.2.1.**

Item (b), *delete* '±12.5 percent' and *substitute* '−12.5 percent'.

AMDT No 1 APR. 1989 **Page 44. Clause 7.3.**

Delete **'CEMENT MORTAR'.**

Delete Clause 7.3.1 and *substitute*:

7.3.1 Cement mortar lining. Where specified all pipes shall be cement mortar lined along their effective lengths. Where specified all fittings shall be cement mortar lined. The thickness of the cement mortar shall be as given in Table 7.1. Internal surfaces of sockets where specified shall be treated to comply with Clause 7.3.2. The linings shall not affect the sealing of the gaskets.

Delete Clause 7.3.2 and *substitute*:

7.3.2 Bitumen lining. Pipes and fittings where specified, shall be bitumen lined to comply with Clause 7.2.2. The lining shall not affect the sealing of the gaskets.

AMDT No 1 APR. 1989 **Page 53. Appendix G.**

Delete '(This Appendix forms an integral part of this Standard)' and *substitute*:

'(This Appendix does not form an integral part of this Standard)'.

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AUSTRALIAN STANDARD

DUCTILE IRON PRESSURE PIPES AND FITTINGS

AS 2280—1988

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PREFACE

This Standard was prepared by the Association's Committee on Cast Iron Pressure Pipes and Fittings, to supersede AS 2280—1979, *Centrifugally cast ductile iron pressure pipes*. The Standard adds manufacturing requirements and dimensions for ductile iron fittings to those for centrifugally cast ductile iron pressure pipes previously covered by AS 2280—1979. This Standard covers ductile iron pressure pipes and fittings. Nominal pressure ratings are given in Appendix D. Flanges can be drilled for compatibility with AS 2129, Tables C, D, and E (for standard pressure) or Tables F and H (for high pressure).

The classes of pipe are designated K9 and K12; these designations are, in terms of wall thickness, consistent with ISO 2531, *Ductile iron pipes, fittings and accessories for pressure pipelines*, and BS 4772, *Ductile iron pipes and fittings*. Outside diameter designations are consistent with AS 2544, *Grey iron pressure pipes and fittings*.

Fittings covered by this Standard are intended primarily for use with water supply pressure pipes that have outside diameters compatible with the fittings. The fittings specified could, by means of suitable adaptors, be used with other pressure pipes. Details of fittings not covered by this Standard must be specified by the purchaser.

This Standard sets out manufacturing requirements and dimensions for pipes and fittings. The hydrostatic test pressures specified in Appendix E are intended primarily to detect casting flaws and bear no relation to safe working pressures for pipes and fittings. Pipes and fittings having nominal thickness differing from those specified in the appropriate tables of this Standard should of necessity be the subject of an agreement between the purchaser and manufacturer.

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 their future developments in their design. Nonetheless gasket and joint surfaces must be in accordance with manufacturer's standard dimensions and tolerances.

The manufacturer's guidance should be obtained in regard to interchangeability where pipes and fittings of differing designs are to be jointed.

Ductile iron flanges appropriate for the fittings in this Standard have been specifically designed. The criteria used for the design of the flanges has been determined on basic requirements of water supply and sewerage works for which this Standard is primarily prepared.

CONTENTS

FOREWORD

Wall thickness of ductile iron pipes and fittings is selected with consideration to several factors including the following:

(a) The internal pressure to which the pipes and fittings are likely to be subjected, including pressure due to water hammer.

(b) External loads that can be expected to be applied to pipes and fittings during and after installation. The depth of the pipeline in the ground and other pipe laying conditions must be considered.

(c) Stresses due to expansion and contraction.

(d) Stresses incurred during handling of pipes and fittings.

(e) Allowances for corrosion.

A designer of a pipeline has, among other duties, the responsibility of evaluating the possible conditions to which component pipes and fittings will be exposed. The designer must consider whether pipes and fittings manufactured according to this Standard are, in fact, of sufficient strength for a proposed application. Higher strength pipes and fittings may be obtained by the use of different grades of ductile iron or with greater wall thickness.

As a guide, pressure ratings for pipes and fittings are shown in Appendix D together with recommended field hyrostatic test pressures.

STANDARDS ASSOCIATION OF AUSTRALIA

Australian Standard
DUCTILE IRON PRESSURE PIPES AND FITTINGS

SECTION 1. SCOPE AND GENERAL

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

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

This Standard specifies two classes of pipe (namely K9 and K12 as in ISO 2531) on the basis of wall thickness.

NOTES:

1. Guidelines to purchasers on requirements that must or may need to be agreed upon at the time of the enquiry or order are detailed in Appendix A.
2. Nominal sizes DN 525 and DN 675 are not standard cast ductile iron pipe sizes in Australia, and therefore are not included in pipe tables. Pipes of nominal size DN 80 are not commonly produced.
3. Ductile cast iron is a casting material, iron and carbon based, the latter element being present principally as graphite in spheroidal or nodular form. Spheroidal or nodular graphite gives cast iron mechanical properties superior to those of flake-graphite iron while not degrading other characteristics. Ductile cast iron is also known as spheroidal graphite cast iron, SG iron or nodular graphite cast iron.
4. Pressure ratings and maximum field hydrostatic test pressure figures for pipes and fittings installed in the field are given in Appendix D.

1.2 REFERENCED DOCUMENTS. The following Standards are referred to in this Standard:

AS
1111 ISO Metric hexagon commercial bolts and screws
1315 Portland cement
1391 Methods for tensile testing of metals
1646 Rubber joint rings for water supply, sewerage and drainage purposes
1816 Method for Brinell hardness test
Part 1: Testing of metals (AS 1816.1)
1831 Iron castings—Spheroidal or nodular graphite cast iron
2129 Flanges for pipes, valves and fittings
2536 Surface texture
2758 Aggregates and rock for engineering purposes
Part 1: Concrete aggregates (AS 2758.1)

ISO
2531 Ductile iron pipes, fittings and accessories for pressure pipelines

BS
3148 Methods of test for water for making concrete (including notes on the suitability of the water)
3416 Black bitumen coating solutions for cold application
4147 Specification for bitumen based hot applied coating material for protecting iron and steel including suitable primers where required
4772 Specification for ductile iron pipes and fittings

1.3 DEFINITIONS. For the purpose of this Standard, the following definitions apply:

1.3.1 Bulkhead testing condition—a condition of testing for a pipe or fitting whereby a test machine is used to anchor and seal the joints on the pipe or fitting being tested.

1.3.2 Coating—corrosion-inhibiting medium applied to the external surface of a pipe or fitting.

1.3.3 Effective length—overall length of a pipe or fitting measured along its centreline, but excluding the depth of any socket(s).

1.3.4 Fettling—cleaning of castings, removal of fins, gates, and the like, by chipping, grinding, or other mechanical means.

1.3.5 Fitting—any casting intended for connection to a pressure pipeline, e.g. bend, cap, connector, plug, taper, tee.

NOTE: See Appendix B for symbols for fittings.

1.3.6 Free-end testing condition—a condition of testing for a flanged pipe or fitting whereby the flanged end or ends under test are fitted with a blanking piece without external restraint.

NOTE: The arrangement of the seal between the flange and the blanking piece is to result in a load transfer equivalent to that intended to be used on site, i.e. raised face flanges.

1.3.7 Lining—medium applied to the internal surface of a pipe or fitting.

1.3.8 Mortar—cement mortar consisting of portland cement, inert aggregates, and water.

1.3.9 Nominal size—a numerical designation of size which is common to all components in a piping system other than components designated by outside diameters or by thread size. It is a convenient round number for reference purposes and is only loosely related to manufacturing dimensions.

NOTE: Straight-through fittings and fittings having three ends are specified first by the ends on the 'run' with the prefix 'DN' followed by a number and the remaining end with the prefix 'dn' followed by a number.

1.3.10 Test sample—a portion of material or a group of items selected from a batch or consignment by a sampling procedure.

1.3.11 Test specimen—a portion of material or a single item taken from the test sample for the purpose of applying a particular test.

1.3.12 Test piece—prepared piece for testing, made from a test specimen by some mechanical operation.

1.4 CLASS DESIGNATION. Ductile iron pipe shall be designated K9 or K12 on the basis of wall thickness (see Figure 5.1).