AS/NZS 4765:2017

Australian/New Zealand Standard™

Modified PVC (PVC-M) pipes for pressure applications

This Joint Australian/New Zealand Standard was prepared by Joint Technical Committee PL-021, PVC, ABS and Polyamide Pipe Systems. It was approved on behalf of the Council of Standards Australia on 20 March 2017 and by the New Zealand Standards Approval Board on 4 April 2017.
This Standard was published on 9 May 2017.

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New Zealand Employers and Manufacturers Association (Central)
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This Standard was issued in draft form for comment as DR2 AS/NZS 4765:2016.

Australian/New Zealand Standard™

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Originated as AS/NZS 4765(Int):2000.
Second edition 2007.
Third edition 2017.

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 978 1 76035 757 3

PREFACE

This Australian/New Zealand Standard was prepared by Committee PL-021, PVC, ABS and Polyamide Pipe Systems, to supersede AS/NZS 4765:2007.

The objective of this Standard is to outline minimum requirements for the manufacture and performance of PVC-M pipes for pressure applications for use by manufacturers, specifiers and purchasers of these products.

The objective of this revision is to update the Standard and incorporate requirements for Best Environmental Practice PVC.

This Standard is intended to apply to PVC-M pipes that exhibit an enhanced level of toughness and ductility as a consequence of the addition of impact modifiers and provide a consistent means of assessment of quality and performance, together with a common design criterion. A comprehensive series of tests are given with the intention of ensuring PVC-M pipe has a combination of high strength and ductility over a wide range of service conditions.

In the preparation of this Standard, consideration has been given to international best practice.

The test criteria specified applies to pipes at the time of manufacture. Pipes or fittings that have been in service might not meet the same performance requirements.

Appendix G sets out the provisions for best environmental practice PVC for PVC-M pressure pipe. These provisions are in accordance with the credit criteria established by the Green Building Council of Australia in their Green Star rating program.

For best environmental practice PVC satisfying the provisions of Appendix G, an attestation of compliance for upstream materials such as chlorine and vinyl chloride, is necessary. Such attestations can take the form of a declaration of conformity prepared and maintained in accordance with ISO/IEC 17050, *Conformity assessment—Supplier's declaration of conformity*, Part 1: *General requirements*, and Part 2: *Supporting documentation*. Part 1 addresses the contents of the declaration of conformity and the procedures necessary to ensure ongoing compliance. Part 2 addresses the documentation required to support a declaration of conformity including the contents, traceability, availability and retention period.

The terms 'normative' and 'informative' have been used in this Standard to define the application of the appendices 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.

Notes to text are for information and guidance only.

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FOREWORD

This Australian/New Zealand Standard defines the requirements for modified PVC (PVC-M) pipes. The Standard covers two ranges of pipe sizes, Series 1 and Series 2. Series 1 pipes are a metric pipe size and Series 2 pipes have dimensions that are compatible with cast iron pressure pipes and fittings.

The out-of-roundness tolerance on the outside diameters is applicable to pressure classes PN 12 and above. No such tolerance is placed on Classes PN 9 and below because the thinner walled pipes may be easily re-rounded when inserted into sockets.

The wall thickness of pipes designed in accordance with this Standard have been calculated using the Barlow equation with a hydrostatic design stress of 17.5 MPa. In the interest of serviceability and irrespective of the calculated minimum wall thickness, this Standard does not provide for a wall thickness of less than 2.5 mm. Also in the interests of serviceability, the maximum SDR has been restricted to 47 irrespective of the wall thickness calculated by the hydrostatic design stress of 17.5 MPa.

Calculation of the minimum wall thickness is as follows:

$$T_{\min} = \frac{PD_{\text{m min}}}{2S + P}$$

where

$T_{\min}$ = minimum wall thickness, in millimetres

P = maximum allowable operating pressure, in megapascals

$D_{\text{m min}}$ = minimum outside diameter of the pipe, in millimetres

S = hydrostatic design stress of the material, in megapascals, at 20°C.

Conformance with the MRS requirement is determined from the 20°C stress regression curve developed from testing of multiple specimens and analysing the results according to AS/NZS 1462.29, *Methods of test for plastics pipes and fittings*, Method 29: *Plastics piping and ducting systems—Determination of the long-term hydrostatic strength of thermoplastics materials in pipe form by extrapolation (ISO 9080:2003, MOD)*.

The analysis adopts the 50 years extrapolation point on the regression curve as the reference for design purposes. This is consistent with long standing international practice. It should not be taken that either—

(a) the pipes weaken with time; or

(b) the predicted life is 50 years.

Actual system life is dependent on manufacture, transport, handling, installation, operation, protection from third party damage and other external factors.

For water supply applications, the actual life can be expected to be in excess of 100 years before major rehabilitation is required.

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S E C T I O N 1 S C O P E A N D G E N E R A L

1.1 SCOPE

This Standard specifies requirements for pipes, integral joints and post-formed bends of PVC-M for the conveyance of water and wastewater under pressure. The pipes are intended for installation below ground, and above ground where they are not exposed to direct sunlight.

Appendix G sets out additional requirements for pipes classed as best environmental practice PVC pressure pipe.

NOTES:

1 Relevant installation requirements for pipe systems, including PVC-M pressure pipes manufactured to this Standard and the associated fittings are covered by AS/NZS 2032, AS/NZS 2566.2 and the AS/NZS 3500 series, as applicable.

2 If the intention is to use pipes complying with this Standard for the conveyance of fluids other than water, the manufacturer should be consulted.

3 Two series of pipes are specified (see the Foreword in this Standard).

1.2 MEANS FOR DEMONSTRATING COMPLIANCE

Appendix A specifies a means of demonstrating conformance with this Standard. Appendix A defines the minimum requirements for a sampling and testing plan. Where variations to this plan are made, demonstration of conformance with the minimum requirements may be necessary.

1.3 REFERENCED DOCUMENTS

The following documents are referred to in this Standard.

AS

681 Elastomeric Seals—Material requirements for pipe joint seals used in water and drainage applications

681.1 Part 1: Vulcanized rubber

1199 Sampling procedures for inspection by attributes

1199.1 Part 1: Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection

1646 Elastomeric seals for waterworks purposes

AS/NZS

1462 Methods of test for plastics pipes and fittings

1462.1 Method 1: Method for determining the dimensions of pipes and fittings

1462.4 Method 4: Method of determining reversion of plastics pipes

1462.6 Method 6: Thermoplastics pipes, fittings and assemblies for the transport of fluids under pressure—Resistance to internal pressure

1462.15 Method 15: Method for determination of vinyl chloride monomer content

1462.16 Method 16: Method for high temperature testing of pipe