

AS/NZS 4765:2017  
(Incorporating Amendment No. 1)



Australian/New Zealand Standard™

# Modified PVC (PVC-M) pipes for pressure applications



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AS/NZS 4765:2017

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.

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The following are represented on Committee PL-021:

- Association of Accredited Certification Bodies
- Australian Chamber of Commerce and Industry
- Energy Networks Association
- Engineers Australia
- Local Government New Zealand
- New Zealand Employers and Manufacturers Association (Central)
- Chemistry Australia
- Plastics Industry Pipe Association of Australia
- Plastics New Zealand
- Water New Zealand
- Water Services Association of Australia

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Australian/New Zealand Standard™

# Modified PVC (PVC-M) pipes for pressure applications

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## Preface

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

**A1** This Standard incorporates Amendment No. 1 (June 2024). The start and end of changes introduced by the Amendment are indicated in the text by tags including the Amendment number 1. **A1**

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.

**A1** AS/NZS 5395 **A1** 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.

**A1** [Text deleted.] **A1**

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.

NOTES

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# Australian/New Zealand Standard

## Modified PVC (PVC-M) pipes for pressure applications

### Section 1 Scope and general

#### 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.

**A1** Additional requirements for pipes and fittings classed as best environmental practice PVC are set out in AS/NZS 5395. **A1**

NOTE 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.

NOTE 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.

NOTE 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.