

Australian/New Zealand Standard™

**Polyethylene (PE) pipes for pressure applications**



## **AS/NZS 4130:2009**

This Joint Australian/New Zealand Standard was prepared by Joint Technical Committee PL-006, Polyolefin Pipe systems. It was approved on behalf of the Council of Standards Australia on 3 April 2009 and on behalf of the Council of Standards New Zealand on 3 April 2009.

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The following are represented on Committee PL-006:

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Energy Networks Association  
Engineers Australia  
Master Plumbers, Gasfitters and Drainlayers New Zealand  
National Plumbing Regulators Forum  
New Zealand Water and Waste Association  
Plastics Industry Pipe Association of Australia  
Plastics New Zealand  
Plumbing Products Industry Group  
Water Services Association of Australia

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## Australian/New Zealand Standard™

# Polyethylene (PE) pipes for pressure applications

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Originated in New Zealand in part as 1189—1953.  
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## PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee PL-006, Polyolefin Pipe Systems, to supersede AS/NZS 4130:2003, *Polyethylene (PE) pipes for pressure applications*.

*This Standard incorporates Amendment No. 1 (October 2009). 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 document is to provide a standard specification for manufacturers and purchasers of polyethylene pipes used for pressure applications.

This revision is based largely on the latest ISO documents. The notable exception is the inclusion of Series 3 gas pipes, which are included for reasons of compatibility with existing systems. Series 2 gas pipe dimensions are such as to ensure compatibility with existing systems that conform to the ISO 11922-1 size series. Series 1 pressure pipes are for general pressure applications and are compatible with the ISO 11922-1 size series dimensions.

Installation requirements are covered by AS 2033, *Installation of polyethylene pipe systems* and AS/NZS 4645, *Gas distribution networks*.

Changes in this revision include:

- (i) Larger pipe sizes, up to DN 2000, in line with ISO 4427.
- (ii) Stripe widths changed to include percent coverage of external surface to facilitate identification.
- (iii) Removal of PE 80C material designation as this material is no longer commonly used in practice for pressure pipes.
- (iv) The requirements for decohesion testing of stripe/jacketing material has been removed.
- (v) Definition of fuel gas changed to align with ENA requirements.
- (vi) For series 2 gas pipes, SDR 9, SDR 21 and SDR 26 included, SDR 17.6 replaced with SDR 17.
- (vii) A new design factor of 1.2 has been added for pipe cracking without liner pipe.

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 an 'informative' appendix is only for information and guidance.

Statements expressed in mandatory terms in notes to tables are deemed to be requirements of this Standard. Other notes are for information only.

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## FOREWORD

This Standard covers three series of pipe dimensions. Series 1 for general pressure applications and Series 2 and 3 for fuel gas applications.

Pipes made from similar polyethylene compounds from different manufacturers may need to be evaluated to ensure compatibility in welding and similar operations (see AS 2033).

Resistance to rapid crack propagation (RCP) has not been included as a requirement in this Standard. RCP is a potential failure mode in thick wall pipes carrying compressible fluids and operating at high stresses and low temperatures.

Wall thicknesses for the specified pipes have been calculated from equations that take into account the hydrostatic design stress (HDS) of the material and the working pressure and diameter of the pipe. HDS values for Series 1 pipes ( $C = 1.25$ ) are given in the table below. In the interest of serviceability of the pipe and irrespective of the calculated minimum wall thickness, this Standard does not provide for a wall thickness of less than 1.6 mm.

### HDS VALUES FOR SERIES 1 ( $C = 1.25$ )

Compound	Series 1 HDS (MPa)
PE 80	6.3
PE 100	8.0

By convention, plastics pipe systems are often designed on the basis of 50 year extrapolated test data. This is established international practice but is not intended to imply the service life of pressure pipe is limited to 50 years. For correctly manufactured and installed systems, the actual life cannot be predicted, but can logically be expected to be well in excess of 100 years before major rehabilitation is required.

## STANDARDS AUSTRALIA/STANDARDS NEW ZEALAND

## Australian/New Zealand

## Polyethylene (PE) pipes for pressure applications

**1 SCOPE AND APPLICATION****1.1 Scope**

This Standard specifies requirements for polyethylene pipes for the conveyance of fluids under pressure. Such fluids include, but are not restricted to, water, wastewater, slurries, compressed air, and fuel gas. Fuel gas includes natural gas, liquefied petroleum gas (LPG) in the vapour phase and LPG/air mixtures.

Pipes that do not contain carbon black, in compliance with this Standard, are not intended for extended exposure in direct sunlight.

**1.2 Application**

Means for demonstrating compliance with this Standard shall be in accordance with Appendix A.

Pipes intended for the transmission of fuel gas are hereinafter referred to as ‘gas pipes’ and shall be operated up to a MAOP of 1050 kPa gauge.

The test requirements specified in this Standard may be achieved by alternative test methods if such methods can be shown to provide equal or greater accuracy than those specified herein. In all cases of dispute, the methods specified in this Standard shall be considered the reference test methods.

**2 NORMATIVE REFERENCES**

The following documents are indispensable for the application of this Standard.

NOTE: Documents referenced for informative purposes are listed in the Bibliography.

## AS

- |         |                                                                                                                            |
|---------|----------------------------------------------------------------------------------------------------------------------------|
| 1199    | Sampling procedures for inspection by attributes                                                                           |
| 1199.1  | Part 1: Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection                               |
| 1462    | Methods of test for plastics pipes and fittings                                                                            |
| 1462.24 | Part 24: Determination of resistance to crack propagation—Test methods for slow crack growth in notched pipes (notch test) |

## AS/NZS

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|---------|------------------------------------------------------------------------------------------------------------------------------------|
| 1462    | Methods of test for plastics pipes and fittings                                                                                    |
| 1462.1  | Part 1: Method for determining the dimensions of pipes and fittings                                                                |
| 1462.4  | Part 4: Method of determining reversion UPVC pipes                                                                                 |
| 1462.6  | Part 6: Thermoplastic pipes, fittings and assemblies for the transport of fluids under pressure—Resistance to internal pressure    |
| 1462.26 | Part 26: Determination of weathering resistance of plastics pipes for external storage                                             |
| 1462.28 | Part 28: Method for the assessment of the degree of pigment or carbon black dispersion in polyolefin pipes, fittings and compounds |
| 2566    | Buried flexible pipes                                                                                                              |
| 2566.1  | Part 1: Structural design                                                                                                          |