AS/NZS 4130:2009

Australian/New Zealand Standard™

Polyethylene (PE) pipes for pressure applications

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.
This Standard was published on 4 June 2009.

The following are represented on Committee PL-006:

Certification Interests (Australia)
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

Keeping Standards up-to-date

Standards are living documents which reflect progress in science, technology and systems. To maintain their currency, all Standards are periodically reviewed, and new editions are published. Between editions, amendments may be issued. Standards may also be withdrawn. It is important that readers assure themselves they are using a current Standard, which should include any amendments which may have been published since the Standard was purchased.

Detailed information about joint Australian/New Zealand Standards can be found by visiting the Standards Web Shop at www.standards.com.au or Standards New Zealand web site at www.standards.co.nz and looking up the relevant Standard in the on-line catalogue.

Alternatively, both organizations publish an annual printed Catalogue with full details of all current Standards. For more frequent listings or notification of revisions, amendments and withdrawals, Standards Australia and Standards New Zealand offer a number of update options. For information about these services, users should contact their respective national Standards organization.

We also welcome suggestions for improvement in our Standards, and especially encourage readers to notify us immediately of any apparent inaccuracies or ambiguities. Please address your comments to the Chief Executive of either Standards Australia or Standards New Zealand at the address shown on the back cover.

This Standard was issued in draft form for comment as DR 07399.

Australian/New Zealand Standard™

Polyethylene (PE) pipes for pressure applications

Originated in Australia in part as AS K119—1962.
Originated in New Zealand in part as 1189—1953.
Previous edition AS/NZS 4130:2003.
Fifth edition 2009.

Jointly published by Standards Australia, GPO Box 476, Sydney, NSW 2001 and Standards New Zealand, Private Bag 2439, Wellington 6020

ISBN 0 7337 9161 1

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*.

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.

CONTENTS

Page

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. Gas pipes are not intended for service temperatures outside of the range –20°C to +35°C.

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

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

AS/NZS 4130:2009 Polyethylene (PE) pipes for pressure applications