

Australian/New Zealand Standard™

**Plastics piping systems for soil and  
waste discharge (low and high  
temperature) inside buildings—  
Polyethylene (PE)**



## **AS/NZS 4401:2006**

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 30 January 2006 and on behalf of the Council of Standards New Zealand on 10 February 2006.

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**RECONFIRMATION**

**OF**

**AS/NZS 4401:2006**

**Plastics piping systems for soil and waste discharge (low and high temperature)  
inside buildings—Polyethylene (PE)**

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## NOTES

## Australian/New Zealand Standard™

# Plastics piping systems for soil and waste discharge (low and high temperature) inside buildings— Polyethylene (PE)

Originated as AS/NZS 4401 (Int):1999.  
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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 4401(Int):1999.

This Standard is an adoption with national modifications and has been reproduced from ISO 8770:2003, *Plastics piping systems for soil and waste discharge (low and high temperature) inside buildings—Polyethylene (PE)*.

AS/NZS 4401(Int.):1999 was based on a previous edition of ISO 8770 (ISO 8770:1991), *High-density polyethylene (PE-HD) pipes and fittings for soil waste discharge (low and high temperature) systems inside buildings—Specifications*, and included a number of variations to the technical contents of the ISO Standard for use in Australia and New Zealand.

Following the publication of the 2003 edition of ISO 8770 such Australian/New Zealand variations to the technical contents are no longer required and the current edition of the Standard is fully equivalent to the ISO Standard.

Minor variations to the ISO Standard have been included in this document, which relate to normative references and marking requirements and do not change its technical contents.

Variations to ISO 8770:2003 are indicated at the appropriate places throughout this Standard. Strikethrough (~~example~~) identifies ISO text which, for the purposes of this Australian/New Zealand Standard, is deleted. Where text is added, it is set in its proper place and identified by shading (example).

As this Standard is reproduced from an International Standard, the following applies:

- (a) Its number does not appear on each page of text and its identity is shown only on the cover and title page.
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- (c) A full point should be substituted for a comma when referring to a decimal marker.

In this Standard, statements expressed in mandatory terms in notes for figures are deemed to be requirements of the Standard.

The terms ‘normative’ and ‘informative’ are used to define the application of the annex to which they apply. A normative annex is an integral part of a Standard where as informative annex is only for information and guidance.

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## INTRODUCTION

Pipes and fittings conforming to this International Standard also meet the requirements of EN 1519-1 which are applicable to those pipes and fittings which, according to EN 1519-1, are intended to be used inside buildings (application area code “B”, see EN 1519-1) only.

## STANDARDS AUSTRALIA/STANDARDS NEW ZEALAND

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Any table, figure or text of the international standard that is struck through is not part of this standard. Any Australian/New Zealand table, figure or text that is added is part of this standard and is identified by shading.

**1 Scope**

This International Standard specifies the requirements for solid-wall polyethylene (PE) pipes and fittings for soil and waste discharge (low and high temperature) inside buildings, as well as the system itself. It does not include buried pipework.

It also specifies the test parameters for the test methods referred to in this International Standard.

This International Standard is applicable to PE pipes and fittings, as well as assemblies of such pipes and fittings, intended to be used for the following purposes:

- a) soil and waste discharge pipework for the conveyance of domestic waste waters (low and high temperature);
- b) ventilation pipework associated with a);
- c) rainwater pipework inside the building.

It is applicable to pipes and fittings designed for jointing by means of elastomeric sealing rings or by butt fusion or electrofusion.

**2 Normative references**

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 265-1, *Pipes and fittings of plastics materials — Fittings for domestic and industrial waste pipes — Basic dimensions: Metric series — Part 1: Unplasticized poly(vinyl chloride) (PVC-U)*

ISO 580, *Plastics piping and ducting systems—Injection-moulded thermoplastics fittings—Methods for visually assessing the effects of heating*

ISO 1133:1997, *Plastics — Determination of the melt mass-flow rate (MFR) and the melt volume-flow rate (MVR) of thermoplastics*

ISO 2505, *Thermoplastics pipes—Longitudinal reversion—Test method and parameters*

ISO 3126:—1), *Plastics piping systems — Plastics components — Determination of dimensions*

ISO 3127, *Thermoplastics pipes—Determination of resistance to external blows—Round-the-clock method*

1) ~~To be published. (Revision of ISO 3126:1974)~~

ISO 23711, Elastomeric seals—Requirements for materials for pipe joint seals used in water and drainage applications—Thermoplastic elastomers

ISO/TR 10837, Determination of the thermal stability of polyethylene (PE) for use in gas pipes and fittings

EN 681-1, *Elastomeric seals — Materials requirements for pipe joint seals used in water and drainage applications — Part 1: Vulcanized rubber*

~~EN 681-2, *Elastomeric seals — Materials requirements for pipe joint seals used in water and drainage applications — Part 2: Thermoplastic elastomers*~~

~~EN 728, *Plastics piping and ducting systems — Polyolefin pipes and fittings — Determination of oxidation induction time*~~

~~EN 743:1994, *Plastics piping and ducting systems — Thermoplastics pipes — Determination of the longitudinal reversion*~~

~~EN 744, *Plastics piping and ducting systems — Thermoplastics pipes — Test method for resistance to external blows by the round-the-clock method*~~

~~EN 763:1994, *Plastics piping and ducting systems — Injection-moulded thermoplastics fittings — Test method for visually assessing effects of heating*~~

EN 1053, *Plastics piping systems — Thermoplastics piping systems for non-pressure applications — Test method for watertightness*

EN 1054, *Plastics piping systems — Thermoplastics piping systems for soil and waste discharge — Test method for airtightness of joints*

EN 1055:1996, *Plastics piping systems — Thermoplastics piping systems for soil and waste discharge inside buildings — Test method for resistance to elevated temperature cycling*

### 3 Symbols and abbreviations

#### 3.1 Symbols

|          |                                         |
|----------|-----------------------------------------|
| $A$      | length of engagement                    |
| $B$      | length of lead-in                       |
| $C$      | depth of sealing zone                   |
| $d_e$    | outside diameter (at any point)         |
| $d_{em}$ | mean outside diameter                   |
| $d_n$    | nominal outside diameter                |
| $d_s$    | inside diameter of the socket           |
| $d_{sm}$ | mean inside diameter of the socket      |
| DN       | nominal size                            |
| DN/OD    | nominal size (outside-diameter related) |
| $e$      | wall thickness (at any point)           |
| $e_m$    | mean wall thickness                     |

|          |                                            |
|----------|--------------------------------------------|
| $e_2$    | wall thickness of the socket               |
| $e_3$    | wall thickness at the groove               |
| $E$      | wall thickness of an electrofusion socket  |
| $L_1$    | length of spigot                           |
| $L_2$    | depth of penetration                       |
| $L_3$    | length of fusion zone                      |
| $L_4$    | unheated length of an electrofusion socket |
| $l$      | effective length of a pipe                 |
| $N$      | effective insertion depth                  |
| $R$      | radius of swept fittings                   |
| $z$      | design length ( $z$ -length) of a fitting  |
| $\alpha$ | nominal angle of a fitting                 |

### 3.2 Abbreviations

|     |                          |
|-----|--------------------------|
| PE  | polyethylene             |
| MFR | melt mass-flow rate      |
| OIT | oxidation induction time |

## 4 Material

### 4.1 PE compound

The compound for pipes and fittings shall be PE based material to which may be added those additives that are needed to facilitate the manufacture of components conforming to the requirements of this International Standard.

In order to conform to national requirements on fire regulations, other additives may be used.

Fabricated fittings or parts of fabricated fittings shall be made from pipes and/or mouldings conforming to this International Standard, except for the requirements for the wall thickness of fabricated fittings and/or mouldings from PE which conform to material and physical characteristics as required in this International Standard.

### 4.2 Reprocessable and recyclable material

In addition to virgin material, the use of reprocessable material obtained during the production and testing of products conforming to this International Standard is permitted. External reprocessable or recyclable material shall not be used.

NOTE Definitions concerning materials are given in EN 1519-1.

### 4.3 Melt mass-flow rate

The MFR of the PE base material shall be determined in accordance with ISO 1133:1997, using set of conditions T (temperature: 190 °C, load: 5 kg).