

Australian/New Zealand Standard™

Gas distribution networks

Part 3: Plastics pipe systems



AS/NZS 4645.3:2008

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Australian Pipeline Industry Association
Engineers Australia
Energy Networks Association
Gas Association, New Zealand
Gas Technical Regulators Committee
Liquefied Petroleum Gas Australia
LPG Association, New Zealand
Plastics Industry Pipe Association
Welding Technology Institute of Australia

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PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee AG-008 Gas Distribution, through its Subcommittee AG-008-01, to supersede AS 3723—1989, *Installation and maintenance of plastics pipe systems for gas*.

This Standard incorporates Amendment Nos. 1 (July 2010) and 2 (May 2012). 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 intent of this Standard is to provide for the protection of the general public, operating personnel and the environment, and to ensure safe and reliable operation of gas distribution networks that reticulate gas to consumers.

It covers gas distribution networks covered by AS/NZS 4645.1 for operating pressures up to 700 kPa.

AG-008, in preparation of this Standard, acknowledges that the gas industry will continue to seek to implement technical developments that enable safe, reliable and efficient gas distribution networks. This may include the use of plastics for applications beyond the pressure limits set out in this Standard.

AG-008 acknowledges that as experience (and potentially additional innovation) in the use of higher pressure gas distribution systems is gained, future revisions of this Standard may remove any such pressure limitations, allowing for a means of compliance for plastics gas distribution networks up to an MAOP of 1050 kPa.

In the meantime, AS/NZS 4645.1 provides a means by which such systems can be planned, designed, constructed and maintained.

This series of Standards includes the following parts:

AS/NZS	
4645	Gas distribution networks
4645.1	Part 1: Network management
4645.2	Part 2: Steel pipe systems
4645.3	Part 3: Plastics pipe systems

AS/NZS 4645.1 provides a risk-based framework for management of a gas distribution network and identifies the high-level safety requirements for all stages in the life-cycle of a gas distribution network.

AS/NZS 4645.2 is to be used in conjunction with AS/NZS 4645.1. It covers design, materials, construction, testing and commissioning of steel pipes within a network to provide a means of compliance for aspects of a gas distribution network required by AS/NZS 4645.1.

AS/NZS 4645.3 is to be used in conjunction with AS/NZS 4645.1. It covers design, materials, construction, testing and commissioning of plastics pipes within a network to provide a means of compliance for aspects of a gas distribution network required by AS/NZS 4645.1.

This Standard achieves its purpose through five fundamental principles as follows:

- (a) A gas distribution network shall be designed and constructed to have sufficient controls to withstand the threats to which it may be subjected during construction, testing and operation.
- (b) Before a gas distribution network is placed into operation it shall be inspected and tested to prove its integrity.

- (c) Important matters relating to safety, engineering design, materials, testing and inspection shall be reviewed, documented and approved by a responsible person(s). The responsible person(s) shall, in each case, be defined.
- (d) Operations and maintenance shall provide for continued monitoring and safe operation of the gas distribution network.
- (e) Where changes occur in or to a gas distribution network, which alter the design assumptions or affect the original integrity, appropriate steps shall be taken to assess the changes, to ensure continued safe operation of the network.

The Standard is not a design handbook, nor a manual on distribution practices. It does not remove the need for qualified and experienced engineering design, installation and operation or for competent engineering judgment, and does require interpretation and implementation by competent engineers.

The Australian and New Zealand Technical Regulators have advised that this Standard will only apply to the life cycle of new gas distribution networks and modifications or augmentations to existing assets within gas distribution networks. However, the Sections on operations, maintenance, repair, decommissioning, gas quality and risk assessment may be suitable for application to existing assets in existing networks.

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 in this Standard expressed in mandatory terms, including those in notes, are deemed to be mandatory only for claiming compliance with this Standard. Alternative means of compliance may be acceptable provided the required safety outcomes can be demonstrated with AS/NZS 4645.1.

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Australian/New Zealand Standard
Gas distribution networks**Part 3: Plastics pipe systems**

SECTION 1 SCOPE AND GENERAL

1.1 SCOPE

This Standard specifies materials, design, construction, installation, testing and maintenance requirements for below ground plastics gas distribution networks and shall be used in conjunction with AS/NZS 4645.1, for the distribution of fuel gas suitable for domestic, commercial or industrial uses, where—

- (a) plastics gas distribution networks include those constructed from materials including polyamide (PA), polyethylene (PE) and polyvinyl chloride (PVC-HI); and
- (b) the MAOP of the gas distribution network is not greater than 700 kPa except for plastics mains and services with a DN greater than 200 mm where the MAOP is limited to 600 kPa.

NOTES:

- 1 The diameter and pressure limitations are to limit potential consequences from failure in those systems.
- 2 Although Standard is restricted to less than 700 kPa, sections of this Standard may be useful as guidance for plastics systems with an MAOP greater than 700 kPa. The relevant statutory authority may regard this Standard as appropriate for other than fuel gas.

1.2 EXCLUSIONS

This Standard does not apply to the following:

- (a) Manufactured or mixed gas distribution systems, which may contain more than 1% aromatic hydrocarbons by volume.
- (b) Piping from the outlet of the meter that measures gas to a consumer or equivalent point of supply, and any other piping covered in Australia by AS 5601 and in New Zealand by NZS 5261.

NOTE: Requirements for pipes downstream of the consumer's meter are generally provided in AS 5601 or NZS 5261, but where the operating pressure of the downstream pipe will be higher than provided for in AS 5601 or NZS 5261, the piping requirements of this Standard may be appropriate.

- (c) Piping associated with the handling and storage, as compared to the distribution and reticulation, of LPG (see AS/NZS 1596).
- (d) The design and manufacture of proprietary items (including meters).
- (e) The measurement of gas for billing purposes.
- (f) Transport of gas in the liquid phase.
- (g) Transport of gas including hydrogen either alone or any mixture with hydrogen in significant quantities.