Australian Standard®

PLASTICS PIPES AND FITTINGS FOR GAS RETICULATION—POLYAMIDE

Part 1—PIPES
Part 2—FITTINGS

This Australian Standard was prepared by Committee PL/25, Plastics Pipe and Fittings for Gas. It was approved on behalf of the Council of the Standards Association of Australia on 2 April 1987 and published on 1 June 1987.

The following interests are represented on Committee PL/25:

Confederation of Australian Industry

Department of Labour, Victoria

Department of Mines, Queensland

Federated Master Plumbers of Australia

State Energy Commission, Western Australia

The Australian Gas Association

The Plastics Institute of Australia Inc.

Review of Australian Standards. *To keep abreast of progress in industry, Australian Standards are subject to periodic review and are kept up to date by the issue of amendments or new editions as necessary. It is important therefore that Standards users ensure that they are in possession of the latest edition, and any amendments thereto.*

Full details of all Australian Standards and related publications will be found in the Standards Australia Catalogue of Publications; this information is supplemented each month by the magazine 'The Australian Standard', which subscribing members receive, and which gives details of new publications, new editions and amendments, and of withdrawn Standards.

Suggestions for improvements to Australian Standards, addressed to the head office of Standards Australia, are welcomed. Notification of any inaccuracy or ambiguity found in an Australian Standard should be made without delay in order that the matter may be investigated and appropriate action taken.

This Standard was issued in draft form for comment as DR 85301 and DR 85302.

Australian Standard®

PLASTICS PIPES AND FITTINGS FOR GAS RETICULATION—POLYAMIDE

Part 1—PIPES
Part 2—FITTINGS

First published 1987

PUBLISHED BY STANDARDS AUSTRALIA
(STANDARDS ASSOCIATION OF AUSTRALIA)
1 THE CRESCENT, HOMEBUSH, NSW 2140

ISBN 0 7262 4643 3

PREFACE

This Standard was prepared by the Association's Committee on Plastics Pipes and Fittings for Gas Reticulation under the direction of the Plastics Standards Board. It was prepared as a result of a proposal by the Australian Gas Light Company.

In the preparation of this Standard cognizance was taken of AS 1667—1984, Plastics Pipes and Fittings for Gas Reticulation — Polyethylene — Nominal Size Series and AS 2718—1984, Plastics Pipes and Fittings for Gas Reticulation — Polyethylene — Outside Diameter Series.

CONTENTS

Page

PART 1—PIPES

PART 2—FITTINGS

FOREWORD

In the determination of the hydrostatic design stress of the material specified in this Standard, the following extrapolated 50-year long-term hydrostatic stress values with a 95% confidence level and a factor of safety of three applied, giving a value of 5.0 MPa.

Wall thicknesses for the pipes specified have been calculated from formulas which take into account the hydrostatic design stress of the material and working pressure and diameter of the pipes, however the wall thickness of some pipes in this Standard have been increased in order to sustain envisaged soil loadings. In the interests of serviceability of the pipes and irrespective of the calculated minimum wall thickness, this Standard does not provide for a wall thickness of less than 1.0 mm.

For special applications, the design wall thickness of pipes can be calculated from the following formula for use at service pressures up to and including 575 kPa at temperatures in the range -20°C to +35°C:

$$T_{min} = \frac{P\,D_{m\,max}}{2S + P}$$

where

P = design pressure of pipe, in kilopascals

D_m = maximum mean outside diameter of pipe, in millimetres

T_{min} = minimum wall thickness of pipe, in millimetres

S = hydrostatic design stress at 23°C of 5000 kPa.

STANDARDS ASSOCIATION OF AUSTRALIA

Australian Standard

PLASTICS PIPES AND FITTINGS FOR GAS RETICULATION—POLYAMIDE

PART 1—PIPES

1 SCOPE. This Standard specifies requirements for polyamide pipes for use in gas mains and services for direct burial and reliner applications. Such pipe is intended for use in the distribution of natural gas, manufactured gas, liquefied petroleum gas (LPG) and LPG/air mixtures at pressures up to 400 kPa.

NOTE: Advisory information on alternative methods of determining compliance of a lot with this Standard is given in Appendix A.

2 REFERENCED DOCUMENTS. The following Standards are referred to in this Standard:

AS 1145 Method for Determination of Tensile Properties of Plastics Materials.

AS 1199 Sampling Procedures and Tables for Inspection by Attributes.

AS 1349 Bourdon Tube Pressure and Vacuum Gauges.

AS 1399 Guide to AS 1199, Sampling Procedures and Tables for Inspection by Attributes.

AS 1821-1823 Suppliers Quality Systems.

AS 1984 Vernier Callipers (Metric Series).

AS 2000 Guide to AS 1821-1823, Suppliers Quality Systems.

AS 2033 Installation of Polyethylene Pipe Systems.

AS 2101 Internal Micrometers (Metric Series).

AS 2102 External Micrometers (Metric Series).

AS 2490 Sampling Procedures and Charts for Inspection by Variables for Percent Defective.

AS 2943 Plastics Pipes and Fittings for Gas Reticulation—Polyamide Compounds for Manufacture.

3 DEFINITIONS. For the purpose of this Standard, the following definitions apply:

3.1 Hoop stress—stress in a pipe under pressure acting tangentially to the perimeter of a transverse section.

3.2 Long-term hydrostatic stress—continuously applied hoop stress which is estimated will cause failure at a specified time and temperature.

3.3 Hydrostatic design stress—estimated hoop stress due to internal hydrostatic pressure that can be applied continuously at a specified temperature with a high degree of certainty that failure will not occur. It is obtained by the application of a safety factor to the extrapolated 50-year long-term hydrostatic stress value.

3.4 LP gas (LPG)—liquefied petroleum gas which is composed predominantly of any of the following hydrocarbons or mixtures of all or any of them: ethane, propane, propylene, butane and butylene.

3.5 Natural gas—naturally occurring gas consisting predominantly of methane and small quantities of ethane, nitrogen and carbon dioxide.

3.6 Manufactured gas—gas which is manufactured from coal or by reforming of natural gas, LPG, naphtha, oil or other organic substances which may contain aromatic compounds.

3.7 Maximum working pressure—maximum pressure that can be sustained by the type and class of pipe or fitting for its estimated useful life under the expected working conditions.

3.8 Type test—a test intended to prove the suitability and performance of a new composition, a new compounding or processing technique, or a new design or size of pipe, joint or fitting. Type tests are generally carried out when a change is made in polymer composition or method of manufacture.

3.9 Quality control test—a test carried out during and after manufacture to prove the quality of a production run of pipe or fittings.

3.10 Test station—a pressure test station consisting of end connections, pressure gauges, pressurizing systems and a controlled temperature environment for conducting pressure testing on pipes and fittings.

4 NOTATION. The following notation shall apply in this Standard:

D_e = nominal outside diameter, in millimetres.

D_m = mean outside diameter, in millimetres.

T = wall thickness, in millimetres.

5 CLASSIFICATION. Polyamide gas pipe shall be classified as follows:

(a) *Class 300*—Polyamide pipe without the addition of plasticizers for service pressures up to and including 300 kPa at temperatures in the range –20°C to 35°C.

(b) *Class 400*—Polyamide pipe without the addition of plasticizers for service pressures up to and including 400 kPa at temperatures in the range –20°C to +35°C.

6 COMPOSITION. Polyamide pipe shall be manufactured from polyamide extrusion compounds complying with AS 2943.

NOTE: Dried material should have a moisture content of not more than 0.08 percent.