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Australian Standard 2642, Part 1—1983

POLYBUTYLENE PIPE SYSTEMS
Part 1—POLYBUTYLENE (PB) PIPE EXTRUSION COMPOUNDS

2642 Polybutylene pipe systems
Part 1—1989 Polybutylene (PB) pipe extrusion compounds A4 13pp D

Specifies requirements for polybutylene extrusion compounds suitable for the manufacture of polybutylene pipe for hot and cold water applications. Relevant test methods are included.

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AUSTRALIAN STANDARD

POLYBUTYLENE PIPE SYSTEMS
PART 1
POLYBUTYLENE (PB) PIPE EXTRUSION COMPOUNDS

AS 264[illegible], Part 1—1983

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PREFACE

This standard was prepared by the Association's Committee on Polybutylene Pipe Systems, acting under the authority of the Plastics Standards Board, in conjunction with the Standards Association of New Zealand drafting committee for polybutylene pipe. It is one of a series relating to polybutylene pipe systems; other standards apply to pipes (AS 2642, Part 2*) and to mechanical jointing fittings (AS 2642, Part 3).

In the preparation of this standard, the committee took cognizance of ASTM D 2581, Polybutylene Plastics Molding and Extrusion Materials.

In this standard polybutylene compound has been divided into two types, viz potable and non-potable. The requirements differentiating between the two types have been presented in general terms only as the issues involved are so complex that it is not possible to be more precise. At the time of publication, no evidence has been found to indicate that polybutylene would present a health hazard.

Other requirements specified are composition, density, melt flow index, inclusion of carbon black (black compound only) or alternative stabilizers and strength characteristics when tested at 95°C for periods in excess of 10 000 h.

*In course of preparation.

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STANDARDS ASSOCIATION OF AUSTRALIA

Australian Standard
for
POLYBUTYLENE PIPE SYSTEMS

PART 1—POLYBUTYLENE (PB) PIPE EXTRUSION COMPOUNDS

1 SCOPE. This standard specifies requirements for polybutylene extrusion compounds suitable for making polybutylene pipe for hot and cold water applications.

NOTES:

1. Advisory information on alternative methods of determining compliance of a 'lot' with this standard is given in Appendix A.
2. Polybutylene compound complying with this standard is not intended to be manufactured into pipes for use in gas reticulation.

2 REFERENCED DOCUMENTS. The following standards are referred to in this standard:

AS 1193	Method for the Determination of the Density and Relative Density of Plastics Excluding Cellular Plastics
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 1821-23	Suppliers Quality Control Systems —Levels 1, 2 and 3
AS 1984	Vernier Callipers
AS 2000	Guide to AS 1821-23, Suppliers Quality Control Systems
AS 2101	Internal Micrometers (including Stick Micrometers)
AS 2102	External Micrometers
AS 2490	Sampling Procedures and Charts for Inspection by Variables for Percent Defective
AS 2642	Polybutylene Pipe Systems Part 2—Polybutylene (PB) Pipe for Hot and Cold Water Applications*
BS 2782	Methods of Testing Plastics Part 8: Methods 823A and 823B: Methods for the Assessment of Carbon Black Dispersion in Polyethylene Using a Microscope
ASTM D 1238	Test for Flow Rates of Thermoplastics by Extrusion Plastometer.

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

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

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

3.3 Hydrostatic design stress—the 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 100 000 h long term hydrostatic stress value.

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

3.5 Test pressure—the pressure applied internally to pipes and fittings when being tested for strength and water-tightness.

3.6 Reference curve—the curve connecting the points 7.2 MPa at 0.1 h, 6.8 MPa at 170 h and 4.1 MPa at 100 000 h plotted on log/log graph paper.

3.7 Pipe material temperature—the average temperature estimated as applying through the full wall thickness.

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.

4 TYPES. Polybutylene compound shall be classified into types as follows:

Type POTABLE—suitable for use in the conveyance of potable substances.

Type NON-POTABLE—for use in applications not requiring a potable grade of compound, e.g. transport of slurries, chemicals.

5 COMPOSITION.

5.1 General. Polybutylene polymer shall be prepared by the polymerization of not less than 85 percent butene-1 and not less than 95 percent of total olefins by mass. Polybutylene polymer shall be pre-compounded.

5.2 Density. When determined in accordance with AS 1193, the density of polybutylene compound shall be in the range of 920 kg/m³ to 935 kg/m³.

5.3 Melt Flow Index. When determined in accordance with ASTM D 1238, Condition E (190°C, 2.16 kg load), the melt flow index of polybutylene compound shall be less than 0.75 g/10 min.

*In course of preparation.