AS 3680—1989

Australian Standard®

Polyethylene sleeving for ductile iron pipelines

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Brisbane City Council
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PREFACE

This Standard was prepared by the Standards Australia Committee on Cast Iron Pressure Pipes and Fittings, and is based on current practices used in protecting underground ductile iron pipes and fittings from corrosion in aggressive soils.

This Standard applies to tubular or flat polyethylene film suitable for field application for the protection of buried ductile iron and grey iron pipes and fittings.

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FOREWORD

Polyethylene film was first used as a corrosion protection device for buried cast iron pipes in the U.S.A in the early 1950s; it has proved to be an effective method of controlling corrosion in aggressive soils and is now used for this purpose throughout the world.

The purpose of the loose polyethylene sleeving is to prevent contact between the pipeline and adjacent soils, thus providing a non-aggressive environment for the pipeline and minimizing corrosion. Free flow of ground water within the sleeving is not acceptable and would not be expected to occur with properly installed sleeving. The effectiveness of the sleeving is not impaired by the presence of condensate or small amounts of water which may be trapped within the sleeve.

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Polyethylene sleeving for ductile iron pipelines

1 SCOPE. This Standard specifies requirements for materials for loose polyethylene sleeving intended for the corrosion protection of ductile and grey iron pipelines when installed underground.

NOTES:
1. Guidelines for the application of polyethylene sleeving to ductile iron pipelines and fittings are given in AS 3681.
2. Guidelines for purchasing polyethylene sleeving are given in Appendix E.

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

AS
1326 Polyethylene (polythene) film for packaging and allied purposes
1327 Standard environments for conditioning and testing plastics materials
1635 Methods of testing pressure sensitive adhesive tape
1635.3.1 Method 3.1: Adhesion strength
1635.5.1 Method 5.1: Breaking strength
2102 External micrometers
2193 Methods for calibration and grading of force-measuring systems of testing machines
2280 Ductile iron pressure pipes and fittings
2400 SAA Packaging Code
2400.12 Part 12: Adhesive closing and sealing tapes
3681 Guidelines for the application of polyethylene sleeving to ductile iron pipelines and fittings
CK24 Code of practice for outdoor weathering of plastics in the Australian environment
CK24.1 Part 1: Commercial products

ASTM
D 1709 Test method for impact resistance of polyethylene film by the free-falling dart method
D 1922 Test method for propagation tear resistance of plastic film and thin sheeting by pendulum method

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

3.1 Loose polyethylene sleeving—polyethylene film usually in tube form, used to encase pipe or fittings but which is not bonded to the surface.

3.2 Layflat tube—a tubular form of polyethylene film which has been flattened for handling and storage.

3.3 Nominal size (DN)—a numerical designation of size which is common to all components in a pipeline system other than components designated by outside diameters or by thread size. It is a convenient round number for reference purposes and is only loosely related to manufacturing dimensions.

NOTE: It is designated by DN followed by a number.

3.4 Impact failure load (F_{50})—the missile mass in grams, estimated statistically, at which 50% of the specimens would fail in the specified test.

4 SLEEVING MATERIAL COMPOSITION. Sleeving shall be of non-regenerated polyethylene. The polymer shall have a maximum nominal melt flow index of 1.0, and density not less than 915 kg/m^3 or greater than 930 kg/m^3, complying with AS 1326.

A highly dispersed ultra-violet stabilizer shall be present in the film. When exposed to natural ultra-violet radiation of a level equivalent to 7 weeks exposure at Alice Springs (see AS CK24.1 for equivalence of sunshine hours) the physical properties defined in Clause 6 shall be retained.

The colour of the film should contrast with black pipe.

5 SLEEVING DIMENSIONS.

5.1 General. Sleeving shall be supplied in the form of layflat tubing complying with AS 1326.

5.2 Width. Table 1 gives the recommended layflat tube width for each size of pipe. Tolerance on width shall comply with AS 1326.

TABLE 1

RECOMMENDED LAYFLAT WIDTH OF POLYETHYLENE SLEEVING FOR VARIOUS SIZES OF PIPE

Nominal size (complying with AS 2280)	Layflat tube width mm
DN 80	350
DN 100	350
DN 150	425
DN 200	525
DN 225	635
DN 250	635
DN 300	725
DN 375	875
DN 450	1 100
DN 500	1 100
DN 600	1 270
DN 750	1 500

5.3 Thickness. Nominal film thickness shall be not less than 200 micrometres. Tolerance on thickness shall comply with AS 1326.

6 SLEEVING PERFORMANCE REQUIREMENTS.

NOTE: Performance requirements refer to weathered film complying with Clause 4.

6.1 Ultimate tensile strength. When tested in accordance with Appendix A, the breaking load of the film shall not be less than 50 N in either machine or transverse directions.

6.2 Elongation. When tested in accordance with Appendix A, the elongation shall be not less than 1000% in either machine or transverse directions.

6.3 Impact resistance. When tested in accordance with Appendix B, the impact resistance of the film shall be not less than 900 g.