



Standard Specification for Polyethylene and Ethylene Copolymer Plastic Sheeting for Pond, Canal, and Reservoir Lining¹

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This standard has been approved for use by agencies of the Department of Defense. Consult the DoD Index of Specifications and Standards for the specific year of issue which has been adopted by the Department of Defense.

1. Scope

1.1 This specification covers polyethylene and ethylene copolymer plastic sheeting, 0.20 mm through 0.30 mm (8 through 20 mils) in thickness, for lining ponds, canals, and reservoirs.

1.2 The tests used to characterize the sheeting are intended to ensure good workmanship and quality, and are not necessarily adequate for design purposes in view of the importance of environmental factors and specific performance objectives. Tests have been selected primarily with essentially neutral aqueous systems in mind. Other tests may be necessary to establish chemical resistance and durability under the conditions of a particular application.

1.3 For information on installation techniques, users of this specification are referred to the literature.²

2. Referenced Documents

2.1 ASTM Standards:

D 374 Test Methods for Thickness of Solid Electrical Insulation³

D 618 Methods of Conditioning Plastics and Electrical Insulating Materials for Testing³

D 882 Test Methods for Tensile Properties of Thin Plastic Sheeting⁴

D 1278 Methods for Rubber from Natural Sources—Chemical Analysis⁵

D 1709 Test Method for Impact Resistance of Polyethylene Film by the Free Falling Dart Method⁶

D 1922 Test Method for Propagation Tear Resistance of Plastic Film and Thin Sheeting by Pendulum Method⁶

D 2103 Specification for Polyethylene Film and Sheeting⁶

3. Classification

3.1 This specification covers two types of flexible plastic sheeting as follows:

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² ASAE Recommendation: ASAE R 340, *Installation of Flexible Membrane Linings*, published by The American Society of Agricultural Engineers, St. Joseph, MI 49085.

³ Annual Book of ASTM Standards, Vol 10.01.

⁴ Annual Book of ASTM Standards, Vol 08.01.

⁵ Annual Book of ASTM Standards, Vol 09.01.

⁶ Annual Book of ASTM Standards, Vol 08.02.

3.1.1 *Type I* Sheeting shall be formulated from polyethylene.

3.1.2 *Type II* Sheeting shall be formulated from an ethylene copolymer consisting of a major proportion of ethylene in combination with a minor proportion of some other monomer, or a mixture of polyethylene with a lesser amount of other polymers.

4. Materials and Manufacture

4.1 The sheeting shall be suitably formulated from virgin polyethylene or ethylene copolymer resin to impart durability.

4.2 The resin shall be pigmented with carbon black, evenly dispersed so as to produce an opaque sheeting of uniform color, ranging from dark gray to black.

5. Physical Requirements

5.1 The material shall conform to the physical requirements prescribed in Table 1.

TABLE 1 Physical Requirements of Polyethylene and Ethylene Copolymer Plastic Lining

Property	Requirements	
	Type I	Type II
Tensile strength, min, MPa (psi):		
Machine direction	13.8 (2000)	17.2 (2500)
Cross direction	12.4 (1800)	13.8 (2000)
Elongation at break, each direction, min, percent	500	500
Luminous transmittance, max, percent	1.0	1.0
Tear resistance, each direction, min average kN/m (gf/mil)	31 (80)	39 (100)
Impact resistance, min average, 10 mil thickness kN (gf)	170 (45)	250 (650)
Ash content, max, percent	0.5	0.5

6. Dimensions

6.1 Width of the sheeting shall be held to a tolerance of 1 %.

6.2 Length of the sheeting shall be held to a tolerance of +3 %, –1 %.

6.3 Average thickness of the sheeting shall be held to a tolerance of ± 10 % of nominal, with individual thickness measurements not to exceed ± 25 % of the average.

7. Workmanship and Appearance

7.1 The sheeting shall have good appearance qualities. It shall be free of gels, tears, blisters, pinholes, nicks or cuts in