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An American National Standard

Standard Specification for Chlorinated Polyethylene (CPE) Sheeting for Concealed Water-Containment Membrane[1]

This standard is issued under the fixed designation D4068; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This specification covers flexible chlorinated polyethylene (CPE) sheeting which is used without mastic, bedding, or coating for construction of concealed water-containment membranes in applications where there is potential for costly secondary damage from leakage, and where very long-term reliable performance is essential. Examples are fountains, pools, planters, shower and safe pans, tile tubs, and similar installations where the membrane is inaccessible once construction is complete. Included are requirements for composition, strength and toughness, test methods, workmanship criteria, and methods of marking.

1.2 Manufacturers have the option to use recycled materials in this product. Recycled materials must be in accordance with the requirements in Section 4.

1.3 The test methods used to characterize the sheeting are intended to ensure quality and performance and are not necessarily adequate for design purposes. Test methods have been selected to be conducted primarily with liquids that simulate the environments to which the membrane will be subjected during actual installation and use.

1.4 This specification does not cover water-containment membranes exposed in use to ultraviolet light or direct sunlight.

1.5 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

NOTE 1—There is no known ISO equivalent to this standard.

1.6 The following safety hazards caveat pertains only to the test method portion, Section 14, of this specification: *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.7 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

D412 Test Methods for Vulcanized Rubber and Thermoplastic Elastomers—Tension
D543 Practices for Evaluating the Resistance of Plastics to Chemical Reagents
D618 Practice for Conditioning Plastics for Testing
D751 Test Methods for Coated Fabrics
D883 Terminology Relating to Plastics
D1004 Test Method for Tear Resistance (Graves Tear) of Plastic Film and Sheeting
D1203 Test Methods for Volatile Loss from Plastics Using Activated Carbon Methods
D1204 Test Method for Linear Dimensional Changes of Nonrigid Thermoplastic Sheeting or Film at Elevated Temperature
D1876 Test Method for Peel Resistance of Adhesives (T-Peel Test)
D2136 Test Method for Coated Fabrics—Low-Temperature Bend Test
D2240 Test Method for Rubber Property—Durometer Hardness
D4968 Practice for Annual Review of Test Methods and Specifications for Plastics
D5947 Test Methods for Physical Dimensions of Solid Plastics Specimens
D6988 Guide for Determination of Thickness of Plastic Film Test Specimens

[1] This specification is under the jurisdiction of ASTM Committee D20 on Plastics and is the direct responsibility of Subcommittee D20.24 on Plastic Building Products.

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[2] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

***A Summary of Changes section appears at the end of this standard**

D7209 Guide for Waste Reduction, Resource Recovery, and Use of Recycled Polymeric Materials and Products (Withdrawn 2015)[3]

E96/E96M Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials

2.2 *ANSI Document:*

Safety Code for Safety Glazing Materials for Glazing Motor Vehicles Operating on Land Highways[4]

3. Terminology

3.1 *Definitions:*

3.1.1 *General*—Definitions are in accordance with Terminology D883 unless otherwise indicated.

3.1.2 The abbreviation for chlorinated polyethylene is CPE.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *homogeneous sheeting, n*—sheeting that is of homogeneous composition throughout its thickness. (Note that it is not of a sandwich construction with a continuous or semi-continuous layer of one or more materials of different composition enclosed between two or more layers of CPE.)

3.2.2 *monolithic sheeting, n*—sheeting manufactured as one piece. (Note that it is not several thicknesses laminated together, nor is it two or more widths lapped and joined with heat or chemicals.)

3.2.3 *water containment membrane, n*—a nonporous membrane impervious to water and resistant to permeation by water vapor to an extent that provides a high degree of certainty that secondary damage from leakage shall not occur.

4. Materials and Manufacture

4.1 The sheeting shall be made from a compound that contains more than 50 % chlorinated polyethylene resin by weight of total resin content, and the CPE resin shall: (*a*) contain 38 to 46 % chlorine; (*b*) be made from a linear polyethylene having a density of not less than 0.95 g/cm^2; (*c*) be substantially amorphous, having a heat of fusion of less than 0.4 cal/g (1.7 kJ/kg), and (*d*) have a melt viscosity of 1700 ± 500 Pa·s when measured in a capillary rheometer at a melt temperature of 190 ± 2 °C, and a shear rate of 150 ± 10 s^{-}.

4.2 When recycled materials, as defined in Guide D7209, are used in this product, the material must meet the requirements in Sections 3, 4, 5, 6, 7, and 8.

4.3 The use of water-soluble compounding ingredients shall be prohibited.

4.4 The sheeting shall be homogeneous and monolithic.

5. Physical Requirements

5.1 The sheeting shall have an average Shore-A hardness of 84 ± 6 points when ten specimens taken equidistantly across the width of the sheet are tested in accordance with Test Method D2240, using a Type A durometer and reading durometer hardness after 5 s of presser foot contact with the specimen.

5.1.1 The thickness of the test specimens shall be 0.24 in. (6.0 mm) minimum unless it is known that results equivalent to the 0.24 in. (6.0 mm) values are obtained with a thinner specimen.

5.1.2 The test specimen shall be of solid construction

5.1.2.1 A specimen composed of plied sheets is permitted if it has been shown the results are equivalent to a solid specimen.

NOTE 2—Plied specimens may not agree with those made on solid specimens, as the surfaces of the plied specimens may not be in complete contact.

5.1.3 The lateral dimensions of the specimen shall be sufficient to permit measurements at least 0.48 in. (12.0 mm) from any edge.

5.1.3.1 Measurements are permitted at a lesser distance from an edge if identical results are obtained as 5.1.3.

6. Mechanical Properties

6.1 The sheeting shall conform to the mechanical property requirements in Table 1.

7. Performance Requirements

7.1 The sheeting shall conform to the performance requirements in Table 2.

8. Other Requirements

8.1 The sheeting shall be capable of being bonded to itself in a manner suitable for making seams and repairs in the field. The manufacturer shall recommend or furnish methods, materials, or equipment necessary and suitable for this purpose.

8.2 Bonds between sheets of material used in fabrication of a water-containment membrane shall conform to the requirements in Table 3 and shall not reduce the overall resistance of the membrane to permeation or leakage.

9. Dimensions and Permissible Variations

9.1 The actual width and length of the sheeting shall be as agreed upon between the purchaser and the seller.

9.1.1 Sheeting width tolerance shall be +0.5, –0 in. (+12.7, –0 mm).

TABLE 1 Mechanical Properties

Property	Unit	Specification	
		Grade 1	Grade 2
Thickness	in. (mm)	0.040 (1.02), min	0.030 (0.0765), min
Tensile strength	psi (MPa)	1200 (8.28), min	800 (5.5), min
Tensile stress at 100 % elongation (modulus)	psi (MPa)	400 (2.76), min 1200 (8.28), max	300 (2.07), min 1200 (8.28), max
Elongation, at break	%	350, min	300, min
Tear resistance	lbf/in. (kN/m) of width	175 (30.6), min	120 (20.9), min

[3] The last approved version of this historical standard is referenced on www.astm.org.

[4] Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036, http://www.ansi.org.