



Standard Specification for Vulcanized Rubber Sheets Used in Waterproofing Systems¹

This standard is issued under the fixed designation D6134; 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 unreinforced vulcanized rubber sheets made from ethylene propylene diene terpolymer (EPDM) or butyl (IIR), intended for use in preventing water under hydrostatic pressure from entering a structure.

1.2 The tests and property limits used to characterize these sheets are specific for each classification and are minimum values to make the product fit for its intended purpose.

2. Referenced Documents

2.1 *ASTM Standards*:²

D412 Test Methods for Vulcanized Rubber and Thermoplastic Elastomers—Tension

D471 Test Method for Rubber Property—Effect of Liquids

D573 Test Method for Rubber—Deterioration in an Air Oven

D624 Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers

D746 Test Method for Brittleness Temperature of Plastics and Elastomers by Impact

D816 Test Methods for Rubber Cements

D1204 Test Method for Linear Dimensional Changes of Nonrigid Thermoplastic Sheeting or Film at Elevated Temperature

D2240 Test Method for Rubber Property—Durometer Hardness

D3083 Specification for Flexible Poly(Vinyl Chloride) Plastic Sheeting for Pond, Canal, and Reservoir Lining (Withdrawn 1998)³

E96/E96M Test Methods for Water Vapor Transmission of Materials

E154 Test Methods for Water Vapor Retarders Used in

Contact with Earth Under Concrete Slabs, on Walls, or as Ground Cover

3. Classification

3.1 Types used to identify the principal polymer component of the sheet include:

Type I: Ethylene Propylene Diene Terpolymer (EPDM); and,
Type II: Butyl (IIR)

3.2 The mass percentage of the principal polymer in relation to the total polymer shall be greater than 95 %.

4. Materials and Manufacture

4.1 The sheet shall be formulated from the appropriate polymers and other compounding ingredients. The principle polymer used in the sheet shall be one of those listed in 3.1 in accordance with the percentage listed in 3.2.

4.2 The sheet shall be capable of being bonded to itself for making field splices and repairs, and the manufacturer shall recommend bonding methods and materials.

5. Physical Requirements

5.1 The sheet shall conform to the physical requirements prescribed in Table 1. Other requirements shall be agreed upon between the purchaser and the supplier.

6. Dimensions and Permissible Variations

6.1 The width and length of the sheet shall be agreed upon between the purchaser and the supplier. The width and length tolerance shall be +3, 0 %.

6.2 Sheet thickness greater than the minimum shall be agreed upon between the purchaser and the supplier. The thickness tolerance shall be +15, -10 % of the specified thickness, but in no case shall the thickness be less than the minimum listed in Table 1.

7. Workmanship, Finish, and Appearance

7.1 The sheet shall be watertight and visually free of pinholes, particles of foreign matter, undispersed raw material, or other manufacturing defects that might affect serviceability. If irregularities in the form of pock marks (see Note 1) appear excessive on a sheet, or portion thereof, then its rejection should be negotiated between supplier and purchaser.

¹ This specification is under the jurisdiction of ASTM Committee D08 on Roofing and Waterproofing and is the direct responsibility of Subcommittee D08.18 on Nonbituminous Organic Roof Coverings.

Current edition approved May 1, 2013. Published May 2013. Originally approved in 1997. Last previous edition approved in 2007 as D6134 – 07. DOI: 10.1520/D6134-07R13.

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.

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

TABLE 1 Physical Requirements for Vulcanized Rubber Sheets

	I	II
Type	EPDM	Butyl
Thickness, min, mm (in.)	1.37 (0.054)	1.37 (0.054)
Hardness, durometer A	60 ± 10	60 ± 10
Tensile strength, min MPa (psi)	9 (1300)	8.3 (1200)
Elongation, ultimate min %	300	300
Tensile set max %	10	10
Tear resistance min, kN/m (lbf/in.)	26.2 (150)	26.2 (150)
Brittleness temperature, max °C (°F)	-45 (-49)	-40 (-40)
Heat aging at 240°F		
Tensile strength, min MPa (psi)	8.3 (1200)	6.2 (900)
Elongation ultimate, min %	210	210
Linear dimensional change, max %	±1	±2
Water absorption max, mass %	4	2
Factory seam strength min, MPa (psi)	8.8 (50)	8.8 (50)
Water vapor permeance max, perms mg/pasm ²)	3.5 (0.060)	0.14 (0.0025)
Resistance to soil burial (% change max in original value)		
Breaking factory	10	10
Elongation at break	10	10
Puncture resistance Kg (lbs)	32 (70)	43 (95)

7.2 Factory seams, if present, shall be fully adhered across their entire widths.

7.3 Edges of the sheets shall be straight and flat so that they may be seamed to one another without fishmouthing.

NOTE 1—Pock marks are oblong depressions, cavities, or craters on the surface of the sheet which have approximate surface dimensions of $\frac{1}{8}$ by $\frac{1}{16}$ in. (3.2 by 1.6 mm), and may have a depth approaching one half of the sheet material.

8. Test Methods

8.1 *Thickness*—See Test Methods **D412**.

8.2 *Tensile Strength*—See Test Methods **D412**, Die C.

8.3 *Elongation, Ultimate*—See Test Methods **D412**, Die C.

8.4 *Tensile Set*—See Test Methods **D412**, Method A, Die C, 50 % Elongation.

8.5 *Tear Resistance*—See Test Method **D624**, Die C.

8.6 *Brittleness Temperature*—See Test Method **D746**.

8.7 *Linear Dimensional Change*—See Test Method **D1204**, 166 h at $240 \pm 4^\circ\text{F}$.

8.8 *Water Absorption*—See Test Method **D471**, at $70 \pm 2^\circ\text{C}$ ($158 \pm 4^\circ\text{F}$) for 166 h.

8.9 *Factory Seam Strength*—See Methods of Testing **D816**, Modified Method B, 1-in. wide, 2.0-in./min.

8.10 *Water Vapor Permeance*—See Test Methods **E96/E96M**, Procedure B.W. Relative Humidity of 45 % at $73 \pm 4^\circ\text{F}$.

8.11 *Hardness Durometer A (5-s reading)*—See Test Method **D2240**.

8.12 *Resistance to Soil Burial*—See Specification **D3083** (modified by the test value of the after-exposure specimen shall be based upon the precut sample dimension).

8.13 *Resistance to Heat Aging*—See Test Method **D573** properties after 166 h at $240 \pm 4^\circ\text{F}$.

8.14 *Test Resistance to Puncture*—See Test Methods **E154**.

9. Rejection and Resubmittal

9.1 Failure to conform to any of the requirements prescribed in this specification shall constitute grounds for rejection. In case of rejection, the seller shall have the right to reinspect the rejected material and resubmit the lot after removal of that not conforming to the requirements.

9.2 Inspection of the material shall be agreed upon between the purchaser and the supplier.

10. Product Labeling

10.1 The sheet shall be identified on the side intended to be exposed to the weather with this specification number and type, the name of the manufacturer or supplier, or the generic sheet type. The type of identification mark is at the manufacturer's option. Such identification shall occur at intervals not to exceed 10 ft on center in the long direction of the sheet and shall be applied in such a manner as to be legible at least five years from installation. Identification shall not be required when specified by purchaser.

11. Packaging and Package Marking

11.1 The material shall be rolled on a substantial core and packaged in a standard commercial manner, unless otherwise specified in the contract or order.

11.2 Shipping containers shall be marked with the type of the material, the stock number, lot number, ASTM designation number, type, size, and quantity therein as defined by the contract or order under which shipment is made, the name of the manufacturer or supplier.

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