



Designation: D3468 – 99(Reapproved 2006)^{ε1}

Standard Specification for Liquid-Applied Neoprene and Chlorosulfonated Polyethylene Used in Roofing and Waterproofing¹

This standard is issued under the fixed designation D3468; 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.

^{ε1} NOTE—Editorially switched from English dominant to SI dominant in May 2006.

1. Scope

1.1 This specification covers liquid-applied neoprene and chlorosulfonated polyethylene synthetic rubber solutions suitable for use in roofing and waterproofing.

1.2 The values stated in SI units are to be regarded as standard. The values given in parentheses are for information only.

1.3 The following precautionary caveat pertains only to the test method portion, Section 9, of this specification: *This standard does not purport to address the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 *ASTM Standards*:²

D412 Test Methods for Vulcanized Rubber and Thermoplastic Elastomers—Tension

D429 Test Methods for Rubber Property—Adhesion to Rigid Substrates

D471 Test Method for Rubber Property—Effect of Liquids

D711 Test Method for No-Pick-Up Time of Traffic Paint

D823 Practices for Producing Films of Uniform Thickness of Paint, Varnish, and Related Products on Test Panels

D1149 Test Methods for Rubber Deterioration—Cracking in an Ozone Controlled Environment

D1640 Test Methods for Drying, Curing, or Film Formation of Organic Coatings at Room Temperature

D1644 Test Methods for Nonvolatile Content of Varnishes

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.

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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.

D1824 Test Method for Apparent Viscosity of Plastisols and Organosols at Low Shear Rates

E96/E96M Test Methods for Water Vapor Transmission of Materials

2.2 *Department of Commerce Voluntary Product Standard: PS-1 Construction and Industrial Plywood*³

3. Classification

3.1 *Type I*—Neoprene synthetic rubber solutions for use alone or in combination with chlorosulfonated polyethylene synthetic rubber solutions:

3.1.1 *Grade 1*—Neoprene rubber solution.

3.1.2 *Grade 2*—Fiber-modified neoprene rubber solution.

3.2 *Type II*—Chlorosulfonated polyethylene synthetic rubber solutions.

4. Materials and Manufacture

4.1 The designated polymer shall comprise 100 % of the elastomer and a minimum of 60 % of the nonvolatile content.

4.2 The designated polymer shall be homogeneously compounded with pigments, extenders, stabilizers, antidegradants, and curatives. The product shall be free from graininess, gel particles, and foreign materials.

5. Physical Requirements

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

6. Sampling

6.1 The sample shall be a 1-L (1-qt) aliquot consisting of a composite taken, when possible, from three or more separate containers chosen at random. Samples shall also be taken from any other containers that appear to be nonrepresentative and shall be tested separately. Before a sample is withdrawn, the contents in the container shall be mixed to uniform consistency. The sample shall be placed immediately in an airtight glass jar or metal can until tested.

³ Available from the Superintendent of Documents, U. S. Government Printing Office, Washington, DC 20402.

TABLE 1 Physical Properties of Neoprene and Chlorosulfonated Polyethylene Synthetic Rubber Solutions and Cured Films

Property	Type I (Neoprene)				Type II (Chlorosulfonated Polyethylene)	
	Grade 1		Grade 2		min	max
	min	max	min	max		
<i>Synthetic rubber solutions:</i>						
Solids, weight %	±2 % of the qualification value ^A					
Viscosity, mPa·s (cP)	±20 % of the qualification value ^A					
Drying time, h:						
Dry-to-touch	...	4	...	12	...	4
Dry hard	...	16	...	24	...	24
Solids, volume %	20	...	20	...	20	...
<i>Cured films:</i>						
Tensile strength, MPa (psi)	11 (1600)	...	4.8 (700)	...	4.8 (700)	...
Elongation at 23 ± 2°C (73.4 ± 3.6°F), %	450	...	450	...	350	...
Elongation at -18 ± 2°C (-0.4 ± 3.6°F), %	120	...	120	...	120	...
Permanent set at break, %	...	50	...	50	...	50
Elongation of aged film at 23 ± 2°C (73.4 ± 3.6°F), %	100	...	100	...	200	...
Water absorption, %	...	4.0	...	4.0	...	4.0
Water vapor permeability, ng/Pa·s·m (perm-inches)	...	0.0146 (0.010)	...	0.0146 (0.010)	...	0.0146 (0.010)
Ozone resistance	no cracks under 10× magnification	
Adhesion, kN/m (lbf/in.) width	3.5 (20)	...	1.8 (10)

^A Qualification value is that agreed upon between the seller and purchaser.

7. Retest and Rejection

7.1 If the results of any test do not conform to the requirements of this specification, retesting to establish conformity may be performed as agreed upon between the purchaser and the seller.

8. Specimen Preparation

8.1 Prepare all film specimens in accordance with Method D of Test Methods **D823**.⁴ Take care to prevent puddling and keep specimens horizontal at all times. When more than one coat is required, allow each to dry to touch prior to application of subsequent coats.

8.2 Prepare 0.25-mm (10-mil) wet film specimens for determination of drying time on glass plates, approximately 15 by 75 mm. (5/8 by 3 in.).

8.3 Prepare 0.75-mm (30-mil) wet film specimens for determination of solids, percent by volume, on a release surface⁵ approximately 75 by 150 mm (3 by 6 in.).

8.4 Prepare cured film specimens for all tests except adhesion on release paper⁵ approximately 250 by 350 mm (10 by 14 in.). Adjust the doctor blade to produce a wet film that will give a total dry film thickness of approximately 0.40 mm (15 mils) after two applications. Dry the specimens for 24 h at 23 ± 2°C (73.4 ± 3.6°F) and 50 ± 5 % relative humidity, and then cure

them in accordance with the coating manufacturer's instructions. Condition the cured specimens for 72 h at 23 ± 2°C (73.4 ± 3.6°F) before carefully stripping the film from the release paper.

8.5 Prepare cured film specimens for the adhesion test on the A face of a 13-mm (1/2-in.) exterior grade plywood sheet conforming to the requirements of Voluntary Product Standard PS - 1, approximately 225 by 450 by 6 mm (9 by 18 by 1/4 in.), with 150 mm (6 in.) at one end covered by kraft paper. Use strips of cellophane pressure-sensitive tape along each edge of the kraft paper to ensure smooth, tight contact with the plywood sheet. Prepare a primer consisting of one part of the test coating and two parts of xylene, well stirred together. Brush-apply a coat of primer to the plywood sheet including the paper-covered end, and allow to dry to touch. Then apply two coats of the undiluted test coating, each coat having a minimum wet-film thickness of 0.75 mm (30 mils). When the final test coat has dried for 24 h, brush-apply two coats of neoprene contact adhesive⁶ to the test specimen and to a 225 by 600-mm (9 by 24-in.) strip of No. 10 canvas duck.⁷ Allow both surfaces to dry to a tacky state and then mate the coated side of the canvas strip to the test specimen to facilitate stripping of the film. Cure the test specimens in accordance with the coating manufacturer's instructions, and then condition the cured specimens for 72 h at 23 ± 2°C (73.4 ± 3.6°F). After conditioning, strip back the cellophane tape holding the kraft paper to the plywood sheet and trim off. Cut through the canvas with a sharp knife or razor blade to make 25-mm (1-in.) strips.

⁴ Hand-operated doctor blades are acceptable, provided that bubble-free films varying no more than 5 % in thickness can be produced.

⁵ Trifoil TFE-fluorocarbon-coated aluminum foil tape applied to a flat surface such as glass has been found to be satisfactory. The sole source of supply of the apparatus known to the committee at this time is Tri-Point Industries, Inc., 1 Teflon Way, Long Island, NY 11725. If you are aware of alternative suppliers, please provide this information to ASTM International Headquarters. Your comments will receive careful consideration at a meeting of the responsible technical committee,¹ which you may attend.

⁶ Manufacturers of neoprene roofing materials shall supply test quantities of a compatible contact adhesive to facilitate testing of their coatings.

⁷ Available from tent and awning supply houses.