



Designation: C 836 – 00

Standard Specification for High Solids Content, Cold Liquid-Applied Elastomeric Waterproofing Membrane for Use with Separate Wearing Course¹

This standard is issued under the fixed designation C 836; 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.

This standard has been approved for use by agencies of the Department of Defense.

1. Scope

1.1 This specification describes the required properties and test methods for a cold liquid-applied elastomeric-type membrane, one or two component, for waterproofing building decks subject to hydrostatic pressure in building areas to be occupied by personnel, vehicles, or equipment. This specification applies only to a membrane system above which a separate wearing or traffic course will be applied.

NOTE 1—See Guide C 898 for proper application of membrane.

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

1.3 The following safety hazards caveat pertains only to the test method portion, Section 6, 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 and health practices and determine the applicability of regulatory limitations prior to use.*

1.4 There are no ISO standards similar or equivalent to this ASTM standard.

2. Referenced Documents

2.1 ASTM Standards:

C 33 Specification for Concrete Aggregates²

C 150 Specification for Portland Cement³

C 717 Terminology of Building Seals and Sealants⁴

C 719 Test Method for Adhesion and Cohesion of Elastomeric Joint Sealants Under Cyclic Movement (Hockman Cycle)⁴

C 794 Test Method for Adhesion-in-Peel of Elastomeric Joint Sealants⁴

C 898 Guide for Use of High Solids Content, Cold Liquid-

Applied Elastomeric Waterproofing Membrane with Separate Wearing Course⁴

D 653 Terminology Relating to Soil, Rock, and Contained Fluids⁵

D 1191 Test Methods for Testing Concrete Joint Sealers⁶

3. Terminology

3.1 *Definitions*—Refer to Terminologies C 717 and D 653 for definitions of the following terms used in this specification: cure, elastomeric, hardness, hydrostatic pressure, primer, seal, substrate, waterproofing.

4. Comparison to Other Standards

4.1 The committee with jurisdiction over this standard is not aware of any comparable standards published by other organizations.

5. Physical Requirements

5.1 *Material*—Membrane materials shall cure, after application by spreading or spraying, to form an elastomeric film capable of maintaining a seal against liquid water.

5.2 The physical, mechanical, and performance properties of the membrane shall conform to the requirements described in Table 1.

6. Test Methods

6.1 *Standard Conditions*—Standard conditions for all tests shall be $23 \pm 2^\circ\text{C}$ ($73.4 \pm 3.6^\circ\text{F}$) and $50 \pm 5\%$ relative humidity.

6.2 Conditioning/Mixing:

6.2.1 Store all membrane materials to be tested in an unopened container at standard conditions for at least 24 h before any test specimens are prepared.

6.2.2 Follow the manufacturer's instructions for mixing and preparing membrane materials for testing. Thoroughly mix one-component samples before using. Mix two-component compounds in the ratio recommended by the manufacturer.

6.3 *Test Surfaces*—In addition to the mortar test surfaces specified, use other test surfaces when required by the specifier.

¹ This specification is under the jurisdiction of ASTM Committee C-24 on Building Seals and Sealants and is the direct responsibility of Subcommittee C24.80 on Building Deck Waterproofing Systems.

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² Annual Book of ASTM Standards, Vol 04.02.

³ Annual Book of ASTM Standards, Vol 04.01.

⁴ Annual Book of ASTM Standards, Vol 04.07.

⁵ Annual Book of ASTM Standards, Vol 04.08.

⁶ Annual Book of ASTM Standards, Vol 04.03.



TABLE 1 High Solids Content, Cold Liquid-Applied Elastomeric Waterproofing Membrane Physical Requirements

Property	Requirement	Test Method
Hardness, min	50	6.5 ^A
Weight loss, max, %	20	6.6 ^A
Nonvolatile, min, %	80	
Low temperature flexibility	no cracking	6.7 ^A
Low temperature crack bridging	no cracking	6.7 ^A
Film thickness (vertical surface), min, mm (mils)	1.52 ± 0.13 (60 ± 5)	6.9 ^{B,A}
Adhesion-in-Peel after water immersion, N/m (lbf/in.)	175 (1)	Test Method C 794
Extensibility after heat aging, min, mm (in.)	6.4 (¼)	6.12 ^A
Stability, min, months	6	6.13 ^A

^A Numbers refer to portions of the Test Methods section, Section 6, of this specification.

^B This requirement applies only to materials applied to vertical surfaces. However, any material designed specifically for use on vertical surfaces shall meet all other requirements of this specification.

6.4 Primer—When required by the manufacturer, use a primer as directed by the manufacturer on all substrate materials in test assemblies.

6.5 Hardness:

6.5.1 Following the manufacturer's instructions, apply a film of membrane, 1.52 ± 0.13 mm (60 ± 5 mils) thick, on a 101.5 by 152.5-mm (4 by 6-in.) piece of 6-mil polyethylene film-coated paper and allow the membrane to cure for 14 days at standard conditions. If more than one application is required, the total time for film application shall not exceed 48 h.

6.5.2 After curing, strip the film from the coated paper, cut into pieces, and lay the pieces one upon another to provide a total membrane thickness of not less than 6.1 mm (240 mils).

6.5.3 Using a Type 00 hardness gage, obtain an instantaneous reading of the film hardness.

6.6 Weight Loss:

6.6.1 Prepare two test specimens by placing approximately 10 g of membrane compound into each of two tared small shallow square dishes 76.2 mm (3 in.) on each side formed from 2-mil aluminum foil and weigh accurately. Then immediately place the dishes in a forced-air oven for 72 h at 70 ± 2°C (158 ± 3.6°F).

6.6.2 Remove the specimens and after allowing them to cool for ½ h, weigh them and determine the percent of weight loss.

6.6.3 Determine percent of weight loss by averaging the losses measured on the two test specimens.

6.7 Low-Temperature Flexibility and Crack Bridging:

6.7.1 Apparatus and Materials:

6.7.1.1 Automatic Compression and Extension Machine, as described in Test Method C 719.

6.7.1.2 Circulating Hot-Air Oven.

6.7.1.3 Portland Cement, high early strength, conforming to Specification C 150, Type III.

6.7.1.4 Fine Aggregate conforming to Specification C 33.

6.7.1.5 Masking Tape.

6.7.2 Mix 1 part by weight of cement with 2 parts by weight of aggregate and stir in approximately 0.7 parts by weight of water to produce a uniform mortar mix. Then cast two blocks of the dimensions shown in Fig. 1. Cure the cast blocks 1 day at 100 % relative humidity, followed by 6 days in water, both at standard temperature.

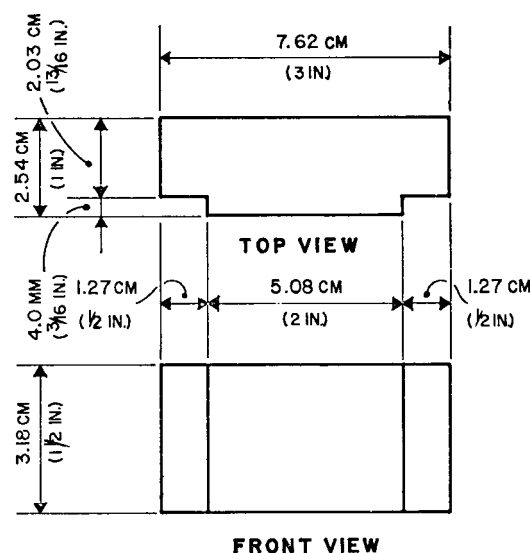


FIG. 1 Test Blocks for Testing Low-Temperature Flexibility and Crack Bridging

6.7.3 Prepare the test assembly as follows: Using the tape, bind the blocks tightly together with the rabbeted edges face to face as shown in Fig. 2. Then spread the membrane compound in a uniform thickness of 1.52 ± 0.13 mm (60 ± 5 mils) over the top 50.8 by 50.8-mm (2 by 2-in.) area bisected by the joint between blocks, as shown in Fig. 2. Leaving the tape in place, cure the assembly for 14 days at standard conditions, followed by 7 days in a circulating hot-air oven at 70 ± 2°C (158 ± 3.6°F).

6.7.4 After curing, remove the tape from the blocks and place them in the automatic compression and extension machine, preconditioned to -26°C (-15°F). Maintaining this temperature, subject the assembly to ten cycles of movement, each cycle consisting of pulling the blocks apart, at the rate of 3.2 mm (¼ in.)/h, until the space between is 3.2 mm, then closing the space at the same rate.

6.7.5 Upon completion of the ten cycles, remove the assembly from the machine and examine the membrane for cracking, loss of adhesion, or any other type of failure.

6.8 Preparation of Mortar Slabs for Tests Other Than Low-Temperature Flexibility and Crack Bridging:

6.8.1 Using the same type of cement and aggregate as specified in 6.7.1.3 and 6.7.1.4, and the mix specified in 6.7.2, cast a 457 by 152 by 76-mm (18 by 6 by 3-in.) block of mortar in a greased mold. Cure the block one day at 100 % relative humidity, followed by 6 days in water, both at standard temperature.

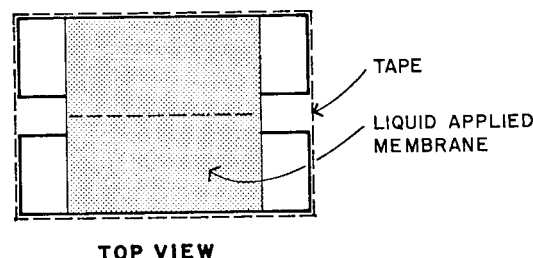


FIG. 2 Test Block Assembly for Testing Low-Temperature Flexibility and Crack Bridging