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Standard Specification for Sheet Materials for Curing Concrete¹

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

¹ This specification is under the jurisdiction of ASTM Committee C09 C09 on Concrete and Concrete Aggregates and is the direct responsibility of Subcommittee C09.22 on Curing Materials Applied to New Concrete Surfaces.

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1. Scope *

1.1 This specification covers materials in sheet form used for covering the surfaces of hydraulic cement concrete to inhibit moisture loss during the curing period and, in the case of the white reflective type materials, to also reduce temperature rise in concrete exposed to radiation from the sun. The following types are included:

1.1.1 *Curing Paper:*

1.1.1.1 Regular.

1.1.1.2 White.

1.1.2 *Polyethylene Film:*

1.1.2.1 Clear.

1.1.2.2 White Opaque.

1.1.3 *White-Burlap-Polyethylene Sheet.*

1.2 The values stated in ~~inch-pound~~ SI units are to be regarded as the standard. Inch-pound units are provided in parentheses for information only.

NOTE 1—This specification does not cover materials such as burlap, cotton mats, or rugs used with additional applications of water to maintain a water-saturated environment on such surfaces. Procedures employing these materials are discussed in ACI 308R. Sheet materials having additional characteristics such as insulating properties and the ability to carry additional water to the curing region are commercially available but are not currently addressed in this specification.

1.3 The text of this standard references notes and footnotes which provide explanatory material. These notes and footnotes shall not be considered as requirements of the standard.

2. Referenced Documents

2.1 *ASTM Standards:*

~~C 156 Test Method for Water Retention by Concrete Curing Materials²~~

D 829 Test Methods for Wet Tensile Breaking Strength of Paper and Paper Products²

² *Annual Book of ASTM Standards*, Vol 04.02, 15.09.

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

~~D 882 Test Methods 4397 Specification for Tensile Properties of Thin Plastic Polyethylene Sheeting~~
~~D 2103 Specification for Polyethylene Film Construction, Industrial and Sheeting⁴ Agricultural Applications³~~
~~E 96 Test Methods for Water Vapor Transmission of Materials²~~

~~E 1347 Test Method for Color and Color-Difference Measurement by Tristimulus (Filter) Colorimetry⁴~~

~~2.2 ACI Standard:~~

~~ACI 308R Standard Practice for Curing Concrete⁵~~

3. Terminology

3.1 *Definitions:*

3.1.1 *curing paper, n*—a composite consisting of two layers of kraft paper bonded together with a bituminous material and reinforced with fiber, used for covering the surface of fresh concrete to inhibit moisture loss during the curing period.

4. Ordering Information

4.1 The purchaser shall specify the type of curing material to be furnished under this specification.

4.2 Lengths and widths of the rolls or mats of the sheet materials furnished shall be as agreed upon between the purchaser and seller.

5. Performance Requirements

5.1 The sheet materials furnished under this specification shall be tough, strong, resilient, and capable of withstanding normal job use without puncturing or tearing.

5.2 The sheet material shall ~~allow moisture loss~~ exhibit a water vapor transmission rate (WVTR) of no more than ~~0.55 kg/m² in 72 h~~ 10 g/m² in 72 h when ~~testing~~ tested according to ~~Procedure E of Test Method C_s E 1596.~~ Procedure E of Test Method E 1596.

5.3 The daylight reflectance of the white side of white curing paper shall be at least 50 % when measured by Test Method E 1347. The daylight reflectance of white polyethylene film and the polyethylene side of white burlap-polyethylene sheet shall be at least 70 % when measured according to Test Method E 1347.

NOTE 2—Daylight reflectance is total luminous reflectance factor, CIE tristimulus value Y for the CIE 1931 (2°) standard observer and CIE standard illuminant C or D65.

6. Physical Requirements

6.1 *Curing Paper* shall consist of two sheets of kraft paper cemented together with a bituminous material in which are embedded cords or strands of fiber running in both directions and not more than ~~1¼ in. (32 mm)~~ 32 mm (1¼ in.) apart. The paper shall be light in color, shall be free of visible defects, and shall have a uniform appearance. White paper shall have a white surface on at least one side.

6.1.1 The tensile strength of curing paper shall be no less than ~~30 lbf/in.~~ 5.25 kN/m of width ~~(5.25 kN/m (30 lbf/in. of width))~~ in the machine direction and ~~15 lbf/in.~~ 2.62 kN/m of width ~~(2.26 kN/m (15 lbf/in. of width))~~ in the cross direction when measured according to Test Methods D 829.

6.2 *Polyethylene Film* shall consist of a single sheet manufactured from polyethylene resins. It shall be free of visible defects and shall have a uniform appearance. The clear type shall be essentially transparent. The opaque film shall contain white pigment.

6.2.1 The ~~tensile strength of polyethylene film shall be no less than 1700 psi (11.7 MPa) in the longitudinal direction and 1200 psi (8.3 MPa) in the transverse direction when measured according to Test Methods D 882.~~

6.2.2 The nominal thickness of polyethylene film shall be no less than ~~0.0040 in. (0.10 mm)~~ 0.10 mm (4 mil) as determined according to Specification ~~D 2103; D 4397.~~ D 4397. Thickness at any point shall be no less than ~~0.0030 in. (0.075 mm).~~

6.2.3 The ~~minimum elongation of polyethylene film~~ 0.075 mm (0.0030 in.).

6.2.2 The ~~impact resistance and mechanical properties shall be 225 % as required in the longitudinal direction and 350 % in the transverse direction when measured according to Test Methods D 882; Specification D 4397.~~

6.3 *White Burlap-Polyethylene Sheeting* shall consist of burlap weighing not less than ~~10 oz./linear yd.~~ 305 g/m² (9 oz./yd²) extrusion coated on one side with white opaque polyethylene ~~0.004 in. (0.10 mm)~~ at least 0.10 mm (0.004 in.) thick ~~as specified in and meeting the other requirements of 6.2.~~ The polyethylene material shall be securely bonded to the burlap so that there will be no separation of the materials during handling and curing of the concrete.

7. Sampling

7.1 Samples of film or sheeting sufficient to determine conformance with this specification shall be taken at random.

8. Keywords

8.1 concrete curing materials; polyethylene film; sheet material for curing concrete; curing paper; white burlap-polyethylene sheet

³ Annual Book of ASTM Standards, Vol T5.09, 08.03.

⁴ Annual Book of ASTM Standards, Vol 086.01.

Annual Book of ASTM Standards, Vol 06.01.

⁵ Available from American Concrete Institute (ACI), P.O. Box 9094, Farmington Hills, MI 48333.

SUMMARY OF CHANGES

Committee C09 has identified the location of selected changes to this standard since the last issue (C 171-97a) that may impact the use of this standard.

(1) New section 5.2 changes the method of test for water retention of sheet material. Test Method E 96 is specified with a required WVTR of no more than 10 g/m² in 24 h. Previous versions specified Test Method C 156 with moisture loss of no more than 0.55 kg/m² in 72 h.

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