Designation: D 6083 – 97a

Standard Specification for Liquid Applied Acrylic Coating Used in Roofing[1]

This standard is issued under the fixed designation D 6083; 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 a liquid-applied water-dispersed 100 % acrylic elastomeric latex coating used as a protective coating for roofs.

1.2 This specification does not provide guidance for application.

1.3 The values stated in inch-pound units are to be regarded as the standard. SI units used are in parentheses. The values given in parentheses are for information only.

1.4 *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.*

2. Referenced Documents

2.1 *ASTM Standards:*

C 794 Test Method for Adhesion-in-Peel of Elastomeric Joint Sealants[2]

D 16 Terminology Relating to Paint, Varnish, Lacquer, and Related Products[2]

D 471 Test Method for Rubber Property-Effect of Liquids[3]

D 522 Test Method for Mandrel Bend Test of Attached Organic Coatings[4]

D 562 Test Method for Consistency of Paints Using the Stormer Viscometer[4]

D 624 Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomer[3]

D 903 Test Method for Peel or Stripping Strength of Adhesive Bonds[5]

D 1079 Terminology Relating to Roofing, Waterproofing, and Bituminous Materials[6]

D 1644 Test Method for Nonvolatile Content of Varnishes[4]

D 1653 Test Method for Water Vapor Transmission of Organic Coated Films[4]

D 2196 Test Methods for Rheological Properties of Non-Newtonian Materials by Rotational (Brookfield) Viscometer[4]

D 2370 Test Method for Tensile Properties of Organic Coatings[4]

D 2697 Test Method for Volume Nonvolatile Matter in Clear or Pigmented Coatings[4]

D 4798 Test Method for Accelerated Weathering Test Conditions and Procedures for Bitumen Materials (Xenon-Arc Method)[6]

3. Terminology

3.1 For definitions of terms used in this specification, see Terminologies D 16 and D 1079.

4. Packaging and Materials

4.1 Shipping containers shall be marked with the name of the material, the stock number, lot number, ASTM designation number and year of issue, quantity therein, shelf-life date, and the name of the manufacturer or supplier.

5. Materials and Manufacture

5.1 *Composition*— The product, as manufactured, shall be in liquid form for application to the roof surface by brushing, squeegeeing, rolling, or spraying. The product shall be composed of a water-based 100 % acrylic elastomeric emulsion polymer, to which various pigments and other additives have been added to give the required physical properties.

6. Liquid and Physical Properties

6.1 Although the product is supplied as a liquid, its performance is based on the functional properties of the dried material in film form. The coating is formed into a film fully adhered to the substrate surface.

6.2 *Liquid Property Requirements*—The liquid coating shall comply with the property requirements in Table 1.

6.3 *Film Physical Property Requirements*—Specimen preparation (dry time) films are prepared by applying two coats, with a minimum of a 4 h drying period between coats, to a fluorinated ethylene-propylene (FEP) sheet substrate (see Test Method D 2370) to give a total dry film thickness of 20 ± 2 mils (0.50± 0.05 mm). The film is allowed to thoroughly dry at 73.4 ± 3.6°F (23 ± 2°C) and 50 ± 10 % relative humidity for 336 ± 12 h. The film shall be removed from the release paper and turned over after the first 168 h to allow for complete

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[2] *Annual Book of ASTM Standards*, Vol 04.07.

[3] *Annual Book of ASTM Standards*, Vol 09.01.

[4] *Annual Book of ASTM Standards*, Vol 06.01.

[5] *Annual Book of ASTM Standards*, Vol 15.06.

[6] *Annual Book of ASTM Standards*, Vol 04.04.

TABLE 1 Liquid Property Requirements

Physical Property	ASTM Designation	Requirements
Viscosity	D 562	85 to 141 KU
	D 2196	12 000 to 85 000 cps
Volume solids	D 2697	greater than 50 %
Weight solids	D 1644	greater than 60 %

drying. (See Table 2.)

7. Test Methods

7.1 *Viscosity (Test Method D 2196)*—Viscosity Brookfield LVT Viscometer No. 4 spindle, 6 RPM.

7.2 *Elongation and Tensile Strength (Test Method D 2370)*:

7.2.1 Test methods: 73.4 ± 3.6°F (23 ± 2°C) at 50 % ± 10 % RH and 0 ± 2°F (−18± 2°C).

7.2.2 Cut specimen measuring 3 in. (75 mm) long by ½ in. (12.7 mm) ± 10 % wide.

7.2.3 *Test Type or Functional Equivalent*:

Cross head speed	1.0 in./min (25.4/min)
Gage length	1.0 in. (25.4 mm)

7.3 *Accelerated Weathering (Test Method D 4798)*:

Cycle employed	A
Black panel temperature	63 ± 3°C
Filter	Inner and outer borosilicate or equivalent
Total irradiance (minimum)	1260 KJ/m^2 at 340 nm 151.2 MJ/m^2 at 300 to 400 nm (1000 h)

TABLE 2 Film Physical Property Requirements for Acrylic Roof Coatings

Physical Property	ASTM Designation	Requirement
Initial percent elongation (break)	D 2370	minimum 100 % 73°F (23°C)
Initial tensile strength (maximum stress)	D 2370	minimum 200 psi (1.38 MPa) 73°F (23°C)
Final percent elongation (break) after accelerated weathering 1000 h	D 2370	minimum 100 % at 73°F (23°C)
Permeance	D 1653	maximum 50 perms ($17.2 \times 10 - 10$ kg/s·m^2·Pa)
Water swelling	D 471	maximum 20 % (mass)
Accelerated weathering 1000 h	D 4798	No cracking or checking
Adhesion	C 794	
	D 903	minimum 2.0 pli (350 N/m) wet
Fungi resistance	G 21	Zero rating
Tear resistance	D 624	>60 lbf/in. (21.0 kN/m)
Low temperature flexibility after 1000 h accelerated weathering	D 522	minimum pass 1 / 2 in. mandrel − 15°F (−26°C)

7.4 *Permeance (Test Method D 1653)*—A 20 mL (0.5 mm) ± 10 % film shall be used.

7.4.1 Test conditions: 73.4 ± 3.6°F (23 ± 2°C) at 50 ± 10 % RH.

7.4.2 Test is run in the inverted position with water in contact with the film.

7.4.3 Value is reported in inch-pound and SI units.

7.5 *Water Swelling (Test Method D 471)*—The test shall be conducted at 73.4 ± 3.6°F (23 ± 2°C) using a 20 mL (0.5 mm) ± 10 % film immersed in distilled water for a period of 168 ± 4 h. At that time, the weight value is determined.

7.6 *Adhesion to Specified Substrate (Test Method C 794 or D 903)* :

7.6.1 Cross head speed 2 in. (50 mm)/min.

7.6.2 Specimens are prepared by brush applying two coats to the specified substrate with the cloth strip (in accordance with Test Methods C 794 and D 903) embedded between the coats to give a total dry film thickness of 20 mL (0.5 mm) ± 10 %. The panels are allowed to dry for 336 ± 12 h at 73.4 ± 3.6°F (23 ± 2°C) 50 ± 10 % relative humidity prior to testing for wet adhesion. If a primer is specified, it shall be applied per the manufacturer's or supplier's direction.

7.6.3 Specimens shall be soaked for 168 ± 6 h in tap water at 73.4 ± 3.6°F (23 ± 2°C) prior to testing for wet adhesion. Samples are tested immediately after soaking.

7.7 *Tear Resistance (Test Method D 624)*—Die C.

7.8 *Low Temperature Flexibility (Test Method D 522)*—Directly cast films to aluminum substrate to result in a dry film thickness of 14 mL ± 10 % (0.5 mm) and allow to dry 72 h at 73.4 ± 3.6°F (23 ± 2°C) and 50 ± 10 % relative humidity followed by 120 h at (50°C) prior to testing.

8. Precision and Bias

8.1 The precision statements for the test methods included in this specification are under development.

9. Inspection

9.1 Inspection of the material shall be as agreed by involved parties.

10. Rejection and Resubmittal

10.1 Failure to conform to any one of the requirements prescribed in this specification shall constitute grounds for rejection. The seller shall have the right to reinspect the rejected shipment and resubmit the lot after removal of those packages not conforming to the specified requirements.

11. Keywords

11.1 acrylic; elastomeric coating; roof