Designation: D 6083 – 05ε1

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.

ε[1] NOTE—An editorial change to subsection 7.3 was made in June 2005.

1. Scope

1.1 This specification covers liquid-applied water-dispersed acrylic latex elastomeric protective roof coatings.

1.2 This specification does not provide guidance for application.

1.3 The values stated in SI units are to be regarded as the standard. 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:* [2]

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

D 16 Terminology for Paint, Related Coatings, Materials, and Applications

D 471 Test Method for Rubber Property-Effect of Liquids

D 522 Test Methods for Mandrel Bend Test of Attached Organic Coatings

D 562 Test Method for Consistency of Paints Measuring Krebs Unit (KU) Viscosity Using a Stormer-Type Viscometer

D 624 Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers

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

D 1079 Terminology Relating to Roofing, Waterproofing, and Bituminous Materials

D 1644 Test Methods for Nonvolatile Content of Varnishes

D 1653 Test Methods for Water Vapor Transmission of Organic Coating Films

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

D 2370 Test Method for Tensile Properties of Organic Coatings

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

D 4798 Practice for Accelerated Weathering Test Conditions and Procedures for Bituminous Materials (Xenon-Arc Method)

G 21 Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi

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 acrylic latex elastomeric emulsion polymer, to which various pigments and other additives have been added to give the required physical properties.

6. Liquid and Cured Film Physical Properties

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

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

[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.

TABLE 1 Liquid Property Requirements

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

6.3 *Film Physical Property Requirements*—The cured film shall comply with the requirements listed in Table 2.

7. Test Methods

7.1 *Specimen Preparation*—Prepare coating films by applying 2 coats, with a minimum of 4 h drying period between coats, to a suitable release surface so film will not tear upon removal (see Test Method D 2370) to give a total dry mil thickness of 0.50 ± 0.05 mm (0.02 ± 0.002 in.). The film is allowed to thoroughly cure at 23 ± 2°C (73.4 ± 3.6°F) 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 curing.

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

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

7.2.2 Cut specimen measuring 75 mm (3 in.) long by 13 mm (0.5 in.) ± 10 % wide.

7.2.3 *Test Type or Functional Equivalent*:

Cross head speed	25 ± 0.5 mm/min (1.0 in./min)
Gage length	25 ± 0.5 mm (1.0 in.)

7.3 *Accelerated Weathering (Practice D 4798)*:

Cycle employed	A
Uninsulated black panel temperature	63 ± 3°C
Filter	Daylight filter
Total radiant energy (minimum)	1260 kJ/(m^2·nm) at 340 nm 151.2 MJ/m^2 at 300 to 400 nm (1000 h at the irradiance level of 0.35 W/(m^2·nm) at 340 nm specified in Test Method D 4798)

TABLE 2 Film Physical Property Requirements for Acrylic Roof Coatings

Physical Property	ASTM Designation	Requirement
Initial percent elongation (break)	D 2370	minimum 100 % 23°C (73°F)
Initial tensile strength (maximum stress)	D 2370	minimum 1.4 MPa (200 psi) 23°C (73°F)
Final percent elongation (break) after accelerated weathering 1000 h	D 2370	minimum 100 % at 23°C (73°F)
Permeance	D 1653	maximum 2875 ng(Pa·s·m^2) (50 perms)
Water swelling	D 471	maximum 20 % (mass)
Accelerated weathering 1000 h	D 4798	No cracking or checking
Adhesion	C 794 D 903	minimum 350 N/m (2.0 pli) wet
Fungi resistance	G 21	Zero rating
Tear resistance	D 624	>21.0 kN/m (60 lbf/in.)
Low temperature flexibility after 1000 h accelerated weathering	D 522	minimum pass 13 mm (0.5 in.) mandrel –26°C (–15°F)

7.4 *Permeance (Test Methods D 1653)*—A 0.5 mm (0.02 in.) ± 10 % film shall be used.

7.4.1 Test conditions: 23 ± 2°C (73.4 ± 3.6°F) 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 SI and inch-pound units.

7.5 *Water Swelling (Test Method D 471)*—The test shall be conducted at 23 ± 2°C (73.4 ± 3.6°F) using a 0.5 mm (0.020 in.) ± 10 % film submerged 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 50 mm/min (2 in./min).

7.6.2 Specimens are prepared by brush applying two coats to a galvanized panel substrate (unless otherwise specified) 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 0.5 mm (0.02 in.) ± 10 %. The panels are allowed to dry for 336 ± 12 h at 23 ± 2°C (73.4 ± 3.6°F) and 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 submerged for 168 ± 6 h in tap water at 23 ± 2°C (73.4 ± 3.6°F) 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, Method B)*—Apply product at uniform thickness to aluminum substrate to result in a dry film thickness of 0.36 mm (0.014 in.) ± 10 % and allow to cure 72 h at 23 ± 2°C (73.4 ± 3.6°F) and 50 ± 10 % relative humidity followed by 120 h at 50°C (122°F) prior to testing.

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

8. Inspection

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

9. Rejection and Resubmittal

9.1 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.

10. Keywords

10.1 acrylic; elastomeric coating; roof