



Standard Specification for Asphalt-Base Emulsions for Use as Protective Coatings for Metal¹

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^{ε1} NOTE—Editorial switched from inch/pound dominant to SI dominant in April 2002.

1. Scope

1.1 This specification covers emulsified asphalt suitable for application in a relatively thick film as a protective coating for metal surfaces.

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

2. Referenced Documents

2.1 ASTM Standards:

C 150 Specification for Portland Cement²

D 2939 Test Methods for Emulsified Bitumens Used as Protective Coatings³

3. Classification

3.1 *Type I*—Quick-setting emulsified asphalt suitable for continuous exposure to water within a few days after application and drying.

3.2 *Type II*—Emulsified asphalt suitable for continuous exposure to the weather, only after application and drying.

4. Materials and Manufacture

4.1 Emulsified asphalt used as a protective coating for metal shall consist of asphalt, water, and emulsifying agents.

5. Composition

5.1 Emulsified asphalt complying with this specification shall conform to the requirements in Table 1.

6. Performance Requirements

6.1 *Uniformity*—The emulsion shall be homogeneous. After a thoroughly stirred sample has been held at 10°C (50°F) in a closed container for 48 h, there shall be no separation of water, coagulation of the asphalt base, settling, or packing in the container that cannot be overcome by moderate hand stirring.

TABLE 1 Composition Requirements

	Type I	Type II
Density, min, g/L (lb/gal U.S.)	1010 (8.4)	990 (8.3)
Residue by evaporation, mass %	52.5 ± 2.5	62.5 ± 2.5
Nonvolatile matter soluble in trichloroethylene, min, mass %	85	94
Ash content, max, mass %	14.5	3.8
Water content mass %	47.5 ± 2.5	37.5 ± 2.5

6.2 *Consistency*—The emulsion shall be of a consistency that will spread readily and permit application by brush, mop, or trowel at the rate of 1.0 L/m² (2.5 gal U.S./100 ft²) to vertical metal surfaces at ambient temperatures above 10°C (50°F). See Section 17 of Test Methods D 2939.

6.3 *Stability*—There shall be no coagulation during the cement addition or at the conclusion of the 1-min mixing period.

6.4 The emulsion shall conform to the additional requirements prescribed in Table 2.

7. Sampling and Test Methods

7.1 Sample the material, and determine the properties enumerated in this specification in accordance with Test Methods D 2939, except for stability and flexibility.

7.2 Stability:

7.2.1 *Material*—High-early-strength portland cement conforming to the requirements for Type III of Specification C 150, and having a minimum specific surface area of 1900 cm²/g (133 556 in.²/lb).

7.2.2 Procedure:

7.2.2.1 Place about 200 g of emulsion in a tared 500-mL round-bottom porcelain dish, and weigh.

7.2.2.2 Add 25 mass % portland cement based on the weight of the emulsion, in small portions while stirring constantly with a stiff spatula.

7.2.2.3 Add small amounts of distilled water if the mixture becomes too stiff to be workable.

7.2.2.4 After addition of all the cement, stir the mixture thoroughly for 1 min.

7.2.2.5 Watch for any sign of coagulation of the asphalt base during addition of the portland cement and after the 1-min stirring period.

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² Annual Book of ASTM Standards, Vol 04.01.

³ Annual Book of ASTM Standards, Vol 04.04.

TABLE 2 Performance Requirements of Emulsified Asphalt

	Type I	Type II
Wet flow, max, mm (in.)	1.6 (1/16)	1.6 (1/16)
Firm set, max, h	24	24
Heat test	no blistering, sagging, or slipping	
Flexibility	no cracking, flaking, or loss of adhesion	
Resistance to water	no blistering or reemulsification	
Loss of adhesion	none	(not required)

7.3 Flexibility:

7.3.1 Use the same test panel that was subjected to the heat test. After cooling for 1 h at $25 \pm 2^\circ\text{C}$ ($77 \pm 4^\circ\text{F}$), bend the panel over a 12.7-mm (1/2-in.) diameter mandrel through 180° in 2 s or less, with the metal side against the mandrel.

7.3.2 Immediately after bending, visually examine the coating for cracking, flaking, and loss of adhesion to the metal. Ignore hairline surface cracks that do not penetrate to the metal.

7.4 *Resistance to Water*—See Test Methods D 2939, Section 15.

8. Precision and Bias

8.1 No statement is made about either the precision or bias for measuring stability or flexibility since the result merely states whether there is conformance to the criteria for success specified in the procedure.

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9. Inspection

9.1 Inspection of the material shall be agreed upon between the purchaser and the supplier as part of the purchase contract.

10. Rejection and Rehearing

10.1 Material that fails to conform to the requirements of this specification may be rejected. Rejection should be reported to the producer or supplier promptly and in writing. In case of dissatisfaction with the results of the test, the producer or supplier may make claim for a rehearing.

11. Packaging and Package Marking

11.1 The material shall be suitably packaged to permit acceptance by the carrier and to afford protection from the normal hazards of handling and shipment.

11.2 Each container shall be plainly marked with the name and brand of the manufacturer or supplier, the type of product, and the manufacturer's production code or lot number.

11.3 Each container shall be marked to indicate that the product was manufactured to meet ASTM Specification D 1187.

12. Keywords

12.1 asphalt; emulsions; metal surfaces; protective coating