



Designation: D5100 – 95a (Reapproved 2005)

## Standard Test Method for Adhesion of Mineral Aggregate to Hot Bitumen<sup>1</sup>

This standard is issued under the fixed designation D5100; 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 ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

### 1. Scope

1.1 This test method determines the adhesion of mineral aggregate when applied over a pour coat of hot bitumen on a roof 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 *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:*<sup>2</sup>

**D226** Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing

**D312** Specification for Asphalt Used in Roofing

**D450** Specification for Coal-Tar Pitch Used in Roofing, Dampproofing, and Waterproofing

**D1079** Terminology Relating to Roofing and Waterproofing

### 3. Terminology

3.1 *Definitions*—For definitions of terms used in this test method, see Terminology **D1079**.

### 4. Summary of Test Method

4.1 A small section of roof surface is fabricated with roofing felt or membrane using measured amounts of a bituminous pour coat and mineral aggregate surfacing. The assembly is

<sup>1</sup> This test method is under the jurisdiction of ASTM Committee **D08** on Roofing and Waterproofing and is the direct responsibility of Subcommittee **D08.03** on Surfacing and Bituminous Materials for Membrane Waterproofing and Built-up Roofing.

Current edition approved May 1, 2005. Published May 2005. Originally approved in 1990. Last previous edition approved in 2004 as D5100 – 95a (2004). DOI: 10.1520/D5100-95AR05.

<sup>2</sup> 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.

allowed to cool, the loose aggregate is removed and weighed, and the mass of adhered aggregate is calculated and reported.

### 5. Significance and Use

5.1 The quantities of mineral aggregate adhered to the surface of a roof vary with the characteristics and total amount of the aggregate. Mineral aggregate shields bituminous membranes from solar radiation. Unadhered mineral aggregate can be displaced by wind, water, and traffic, exposing the bitumen.

5.2 This test method provides a laboratory means of determining and recording the mass of aggregate that adheres to a bituminous pour coat.

### 6. Apparatus

6.1 *Steel Tray*, measuring 143 mm (5 $\frac{5}{8}$  in.)  $\pm$  1 % square by 13 mm (0.5 in.)  $\pm$  10 % in height.

6.2 *Scales*, for weighing bitumen and mineral aggregate, balance 1.00-kg (2.2-lb) capacity, sensitive to 0.01 % of the capacity.

6.3 *Containers*, for hot bitumen and mineral aggregate (1-L (1-qt) capacity).

### 7. Procedure

7.1 Cut a piece of saturated felt to just cover the bottom of the steel tray; the saturated felt shall be Type 1 complying with Specification **D226**.

7.2 Attach the saturated felt to the inside of the tray with a thin film of a release agent such as silicone stopcock grease or petroleum jelly. Lightly grease the insides of the sides of the tray with the same material.

7.3 Weigh out 400 g (0.88 lb) of gravel, chert, or trap rock, or 300 g (0.66 lb) of slag mineral aggregate surfacing  $\pm$  1 %. Record this mass as *A*. This is equivalent to 19.5 kg/m<sup>2</sup> (400 lb/100 ft<sup>2</sup>) and 14.6 kg/m<sup>2</sup> (300 lb/100 ft<sup>2</sup>), respectively.

7.4 Apply top pour coat of bitumen uniformly according to quantities and temperatures listed in **Table 1**.

7.5 Immediately apply mineral aggregate into hot bitumen and spread uniformly over entire surface within the tray. Allow the assembly to cool for 30 min minimum.

7.6 Turn sample upside down and collect loose aggregate. Weigh the loose aggregate and record this mass as *B*.