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Standard Test Method for SOFTENING POINT OF BITUMEN IN ETHYLENE GLYCOL (RING-AND-BALL)¹

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1. Scope

1.1 This method covers the determination of the softening point of bitumen in the range from 30 to 110°C (85 to 230°F) using the ring-and-ball apparatus in an ethylene glycol bath.

NOTE 1—For softening points above 110°C (230°F) use Method D 36, Test for Softening Point of Bitumen (Ring-and-Ball).

2. Applicable Documents

2.1 ASTM Standards:

C 670 Practice for Preparing Precision Statements for Test Methods for Construction Materials²

D 36 Test for Softening Point of Bitumen (Ring-and-Ball)³

D 92 Test for Flash and Fire Points by Cleveland Open Cup³

D 140 Sampling Bituminous Materials⁴

E 1 Specification for ASTM Thermometers⁵

3. Summary of Method

3.1 A steel ball of specified mass is placed upon a disk of bitumen contained within a horizontal, shouldered, metal ring of specified dimensions. The assembly is heated in an ethylene glycol bath at a uniform, prescribed rate and the softening point taken as the temperature at which the bitumen becomes soft enough to allow the ball, enveloped in the bitumen to fall a distance of 25 mm (1 in.).

4. Significance

4.1 Bitumens are viscoelastic materials without sharply defined melting points. Bitumens gradually become softer and less viscous as the temperature rises. For this reason, the determination of softening point must be made by

an arbitrary and closely defined method if the results obtained are to be reproducible.

4.2 Softening point is useful in the classification of bitumen and is indicative of the tendency of the material to flow at elevated temperatures encountered in service.

5. Apparatus

5.1 *Ring*—A brass, shouldered ring conforming to the dimensions shown in Fig. 1 (a).

5.2 *Ball*—A steel ball, 9.5 mm ($\frac{3}{8}$ in.) in diameter, and having a mass of 3.50 ± 0.05 g.

5.3 *Ball-Centering Guide*—A guide for centering the ball, constructed of brass and having the general shape and dimensions shown in Fig. 1 (c).

5.4 *Ring Holder*—The rings shall be supported on a brass ring holder, Fig. 1 (b), as shown in the assembly in Fig. 1 (d).

5.4.1 Rings shall be supported in a horizontal position with the bottoms of the rings 25 mm (1 in.) above the upper surface of the bottom plate. The distance between the bottom plate and the bottom of the bath shall be 16 ± 3 mm ($\frac{5}{8} \pm \frac{1}{8}$ in.).

5.4.2 The thermometer shall be suspended so that the bottom of the bulb is level with the bottom of the rings and within 13 mm (0.5 in.)

¹ This method is under the jurisdiction of ASTM Committee D-8 on Roofing, Waterproofing Bituminous Materials and is the direct responsibility of Subcommittee D08.03 on Surfacing and Bituminous Materials for Membrane Waterproofing and Builtup Roofing.

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² Annual Book of ASTM Standards, Parts 13, 14, 15, and 19.

³ Annual Book of ASTM Standards, Part 15.

⁴ Annual Book of ASTM Standards, Parts 15 and 19.

⁵ Annual Book of ASTM Standards, Parts 25 and 44.