



Designation: D3642 – 98 (Reapproved 2010)

Standard Test Method for

Softening Point of Certain Alkali-Soluble Resins¹

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1. Scope

1.1 This test method covers the determination of the softening point of certain alkali-soluble resins having uniform plastic flow characteristics as the melting point is approached.

1.2 The resin manufacturer should specify whether or not this test method may be used for his product(s).

1.3 This test method is not suitable for styrene-maleic anhydride resins.

NOTE 1—For testing rosin and other resins, see Test Method E28. For testing asphalts, tars, and pitches, see Test Method D2398.

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

D2398 Test Method for Softening Point of Bitumen in Ethylene Glycol (Ring-and-Ball) (Withdrawn 1984)³

E1 Specification for ASTM Liquid-in-Glass Thermometers

E28 Test Methods for Softening Point of Resins Derived from Naval Stores by Ring-and-Ball Apparatus

3. Terminology

3.1 *Definitions:*

3.1.1 *softening point*—the temperature at which a disk of the sample held within a horizontal ring is forced downward a distance of 1 in. (25.4 mm) under the weight of a steel ball as the sample is heated at a prescribed rate in a glycerin bath.

¹ This test method is under the jurisdiction of ASTM Committee D21 on Polishes and is the direct responsibility of Subcommittee D21.02 on Raw Materials.

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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.

³ The last approved version of this historical standard is referenced on www.astm.org.

4. Significance and Use

4.1 In general, with materials of this type, softening does not take place at a definite temperature. As the temperature rises, these materials gradually and imperceptibly change from brittle solids to soft, viscous liquids. For this reason, the determination of the softening point must be made by a fixed, arbitrary, and closely defined methods if the results are to be comparable.

5. Apparatus

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

5.2 *Ball*—A steel ball, 9.53 mm ($\frac{3}{8}$ in.) in diameter, weighing between 3.45 and 3.55 g.

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

5.4 *Container*—A glass vessel, capable of being heated, not less than 85 mm (3.34 in.) in diameter and not less than 127 mm (5 in.) in depth from the bottom of the flare. (An 800-mL, low-form Griffin beaker of heat-resistant glass meets this requirement.)

5.5 *Support for Ring and Thermometer*, as shown in Fig. 1(d). Note the following requirements:

5.5.1 The ring shall be supported in a horizontal position.

5.5.2 The bottom of the ring shall be 25.4 mm (1 in.) above the horizontal plate below it.

5.5.3 The bottom surface of the horizontal plate shall be at least 12.5 mm (0.5 in.) and not more than 19 mm (0.75 in.) above the bottom of the beaker.

5.5.4 The depth of liquid in the beaker shall be not less than 102 mm (4 in.).

5.5.5 The thermometer shall be suspended so that the bottom of the bulb is level with the bottom of the ring and within 12.7 mm (0.5 in.) but not touching the ring.

5.6 *Thermometer*—An ASTM High Softening Point Thermometer, having a range from 30 to 200°C, and conforming to the requirements for Thermometer 16C as prescribed in Specification E1.

5.7 *Mechanical Stirrer*—A variable-speed, motor-driven stirrer attached to the bottom of a true-vertical shaft must be used to ensure uniform heat distribution. The stirrer shall be

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