



Standard Test Method for Softening Point of Pitch (Cube-in-Air Method)¹

This standard is issued under the fixed designation D 2319; 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.

1. Scope

1.1 This test method covers the determination of the softening point above 176°F (80°C) of pitch. Test Method D 3104 gives comparable results.

1.2 The values stated in SI units are to be regarded as the standard.

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:

D 61 Test Method for Softening Point of Pitches (Cube-in-Water Method)²

D 3104 Test Method for Softening Point of Pitches (Mettler Softening Point Method)²

D 4296 Practice for Sampling Pitch³

E 1 Specification for ASTM Thermometers⁴

3. Summary of Test Method

3.1 Two cubes of pitch, supported on wire hooks, are heated in a standardized air oven at a linear rate. The softening point is the mean of the temperatures at which the cubes sag downwards a distance of 60 mm (2.4 in.).

4. Significance and Use

4.1 Pitch does not go through a solid-liquid phase change when heated and therefore does not have a true melting point. As the temperature is raised, pitch softens and becomes less viscous. The softening point is arbitrarily defined and must be determined by a closely controlled method that must be carefully followed if test results are to be reproducible.

4.2 This test method is useful in determining the consistency of pitch as one element in establishing the uniformity of shipments and sources of supply.

5. Apparatus

5.1 *Air Oven*⁵—The oven shall be cylindrical, 150 mm (6 in.) in inside diameter by 155 mm (6.2 in.) in height. It shall have two 75 mm (3-in.) diameter windows of mica, centered vertically on opposite sides, and shall be fitted with a cover having a central opening 25 mm (1 in.) in diameter to hold a thermometer, and a concentric ring suspended below to support the hooks with attached specimens. The ring shall be made of 6 mm (1/4-in.) brass, shall be 54 mm (2 1/8 in.) in outside diameter, and shall be centrally suspended 30 mm (1.2 in.) below the cover. The cover shall have two 3 mm (0.12-in.) holes on a diagonal 50 mm (2 in.) from the center. On the bottom of the oven, an inner pan 140 mm (5.6 in.) in diameter shall rest on three brass legs 5 mm (0.2 in.) in height fastened to the bottom of the pan to provide an air space between the pan and the bottom of the oven. The side wall, cover, and pan shall be made of 0.7 mm (0.028 in.) thick or 22-gage (BWG) copper sheet, and the bottom of 0.8 mm (0.032 in.) thick or 21-gage copper.

5.2 *Tripod for Use with Gas Burner*—The tripod ring shall be approximately 125 mm (5 in.) in inside diameter so that the oven is supported only on its outer edges. It shall be 200 mm (8 in.) in height.

5.3 *Shield for Oven*:⁴ <https://www.astm.org/standards/D2319-98>

5.3.1 *For Use with Electric Heater*—The shield shall be cylindrical, 216 mm or (8.64 in.) in inside diameter by 181 mm or (7 1/4 in.) in height. It shall have two 76 mm or (3-in.) diameter mica windows on opposite sides, positioned to coincide with the windows of the oven when both are placed on the electric heater. It shall be made of 0.7 mm (0.028 in.) thick or 22-gage sheet metal, painted inside and out with aluminum paint.

5.3.2 *For Use with Gas Burner*—The shield shall be identical with that described in 5.3.1 except that it shall be 375 mm (15 in.) in height and the windows shall coincide when the shield is standing on the bench and the oven on the tripod described in 5.2. A door 115 by 115 mm (4 1/2 by 4 1/2 in.) shall be provided at the bottom to give access to the burner.

5.4 *Mold*⁴—A mold suitable for forming two 12.7 mm (1/2-in.) cubes of pitch, having cylindrical core pins 12 gage

¹ This test method is under the jurisdiction of ASTM Committee D-2 on Petroleum Products and Lubricants and is the direct responsibility of Subcommittee D02.05.0F on Industrial Pitches.

Current edition approved Nov. 10, 1998. Published January 1999. Originally published as D 2319 – 64 T. Last previous edition D 2319 – 97.

² *Annual Book of ASTM Standards*, Vol 05.01.

³ *Annual Book of ASTM Standards*, Vol 05.02.

⁴ *Annual Book of ASTM Standards*, Vol 14.03.

⁵ Softening point apparatus items may be obtained as a unit on special order from Humboldt Manufacturing Co., 7302 W. Agatite Ave., Chicago, IL 60656. All other apparatus items described may be obtained from any regular laboratory equipment supply house.