



Standard Test Method for Density of Solid Pitch (Helium Pycnometer Method)¹

This standard is issued under the fixed designation D 4892; 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.

This standard has been approved for use by agencies of the Department of Defense.

^{e1} NOTE—Editorial corrections were made in Section 12 in December 1999.

1. Scope

1.1 This test method covers the determination of pitch density by helium pycnometer. It is applicable at a range of room temperatures of 15 to 35°C.

1.2 *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 71 Test Method for Relative Density of Solid Pitch and Asphalt (Displacement Method)²
- D 2320 Test Method for Density (Specific Gravity) of Solid Pitch (Pycnometer Method)²
- D 2962 Method for Calculating Volume-Temperature Correction for Coal-Tar Pitches³
- D 4296 Practice for Sampling Pitch³
- E 11 Specification for Wire-Cloth Sieves for Testing Purposes⁴

3. Terminology

3.1 Definition of Term Specific to this Standard:

3.1.1 *density, as determined by this test method*— the mass per unit volume and shall be reported as follows:

$$\text{density, 25°C, g/cm}^3 \text{ (grams per cubic centimeter)} \quad (1)$$

4. Summary of Test Method

4.1 The sample is pulverized and screened to a given fraction, then the volume of a weighed portion of the fraction is determined using a helium pycnometer.

5. Significance and Use

5.1 This test method is useful in characterizing pitches as one element in establishing uniformity of shipments and sources of supply. With this method, the density is determined to two decimal places, which is sufficient for most applications. If a more precise measurement is required (three decimal places), use Test Methods D 2320 or D 71.

6. Apparatus

- 6.1 *Helium Pycnometer.*⁵
- 6.2 *Balance,* capable of weighing a 150-g specimen to within 1 mg.
- 6.3 *Sieves,* U.S. Standard 2.36-mm (No. 8), 600- μ m (No. 30), conforming to Specification E 11.
- 6.4 *Thermometer,* for measuring room temperature.

7. Bulk Sampling

7.1 Samples from shipments shall be taken in accordance with Practice D 4296 and shall be free of foreign substances.

8. Dehydration

8.1 All bulk samples suspected of having free moisture should be air-dried or oven-dried at 50°C in a convection or forced-air oven before analyzing.

9. Preparation of Test Specimen

9.1 Crush a 50 to 200-g representative portion of the dry pitch until all of it passes the 2.36 mm (No. 8 sieve). Avoid grinding the pitch. Remove the fines by screening through the 600 μ m (No. 30 sieve) and use the pitch retained on this sieve as the test specimen.

10. Calibration of Helium Pycnometer

10.1 Calibrate daily or before using, following instrument manufacturer's instructions.

⁵ Helium pycnometers available from the following suppliers have been found satisfactory for this purpose: (a) Beckman 2500 Harbor Blvd., Fullerton, CA, (b) Micromeritics, 5680 Goshen Springs Rd., Norcross, GA, and (c) Quantachrome, 5 Aerial Way, Syosset, NY.

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.OF on Industrial Pitches.

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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 14.02.