Designation: D3289 – 17 (Reapproved 2022)

Standard Test Method for Density of Semi-Solid and Solid Asphalt Materials (Nickel Crucible Method)[1]

This standard is issued under the fixed designation D3289; 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 density of semi-solid and solid asphalt materials by weighing in air and in water.

NOTE 1—An alternate method for determining the density of semi-solid and solid asphalt materials is Test Method D70/D70M. For materials which are too fluid for use of this method, use Test Method D3142/D3142M.

1.2 The values stated in SI units are to be regarded as the standard. No other units of measurement are included in this standard.

1.3 **Warning—** Mercury has been designated by the United States Environmental Protection Agency (EPA) and many state agencies as a hazardous material that can cause central nervous system, kidney, and liver damage. Mercury or its vapor may be hazardous to health and corrosive to materials. Caution should be taken when handling mercury and mercury-containing products. See the applicable product Safety Data Sheet (SDS) for details and EPA's website—www.epa.gov/mercury/faq.htm—for additional information. Users should be aware that selling mercury, mercury-containing products, or both, in your state may be prohibited by state law.

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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.5 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

C670 Practice for Preparing Precision and Bias Statements for Test Methods for Construction Materials

D70/D70M Test Method for Specific Gravity and Density of Semi-Solid Asphalt Binder (Pycnometer Method)

D140/D140M Practice for Sampling Asphalt Materials

D3142/D3142M Test Method for Specific Gravity, API Gravity, or Density of Cutback Asphalts by Hydrometer Method

D4311/D4311M Practice for Determining Asphalt Volume Correction to a Base Temperature

E1 Specification for ASTM Liquid-in-Glass Thermometers

2.2 *Other:*

CRC Handbook of Chemistry and Physics

3. Terminology

3.1 *density*—the mass per unit volume of a material.

3.2 *relative density*—the ratio of the mass of a given volume of a material to the mass of the same volume of water at the same temperature (Note 2).

NOTE 2—Relative density is also called specific gravity.

4. Summary of Test Method

4.1 The sample is placed in a nickel crucible and weighed in air, and then in water at the test temperature. The density is calculated from the mass of the sample and its apparent mass when weighed in water.

5. Significance and Use

5.1 Values of density are used for converting volumes to units of mass, and for correcting measured volumes from the temperature of measurement to a standard temperature using Practice D4311/D4311M.

6. Apparatus

6.1 *Crucible,* nickel, high-form, approx. 30 mL capacity, approx. 43 mm in height by approx. 41 mm in diameter.

[1] This test method is under the jurisdiction of ASTM Committee D04 on Road and Paving Materials and is the direct responsibility of Subcommittee D04.47 on Miscellaneous Asphalt Tests.

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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.