



Designation: D 3142 – 97

Standard Test Method for Density of Liquid Asphalts (Hydrometer Method)¹

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1. Scope

1.1 This test method covers the determination of the density of cutback asphalts using a glass hydrometer. It is applicable to cutback asphalts which are liquid at room temperature (see Note 1). It provides more explicit testing procedures than those in Test Method D 1298.

NOTE 1—For materials that are solid or semi-solid at room temperature, use Test Method D 70 or Test Method D 3289.

1.2 The values 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.* Specific precautionary statements are given in Section 7.

2. Referenced Documents

2.1 ASTM Standards:

- C 670 Practice for Preparing Precision and Bias Statements for Test Methods for Construction Materials²
- D 70 Test Method for Density of Semi-Solid and Solid Bituminous Materials (Pycnometer Method)³
- D 140 Practice for Sampling Bituminous Materials³
- D 1250 Petroleum Measurement Tables⁴
- D 1298 Test Method for Density, Relative Density (Specific Gravity), or API Gravity of Crude Petroleum and Liquid Petroleum Products by Hydrometer Method⁴
- D 2026 Specification for Cutback Asphalt (Slow-Curing Type)³
- D 2027 Specification for Cutback Asphalt (Medium-Curing Type)³

¹ This test method is under the jurisdiction of ASTM Committee D-4 on Road and Paving Materials and is the direct responsibility of Subcommittee D04.47 on Miscellaneous Asphalt Tests.

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² *Annual Book of ASTM Standards*, Vol 04.02.

³ *Annual Book of ASTM Standards*, Vol 04.03.

⁴ *Annual Book of ASTM Standards*, Vol 05.01.

D 2028 Specification for Cutback Asphalt (Rapid-Curing Type)³

D 3289 Test Method for Density of Semi-Solid and Solid Bituminous Materials (Nickel Crucible Method)³

D 4311 Practice for Determining Asphalt Volume Correction to a Base Temperature³

E 1 Specification for ASTM Thermometers⁵

E 100 Specification for ASTM Hydrometers⁵

3. Terminology

3.1 Definitions of Terms Specific to This Standard:

3.1.1 *API gravity*—a function of specific gravity 15.6/15.6°F, represented by the equation:

$$^{\circ}\text{API} = (141.5/\text{SG } 15.6/15.6^{\circ}\text{C}) - 131.5 \quad (1)$$

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

3.1.3 *observed values*—values observed at temperatures other than the standard reference temperature. Values observed at other temperatures are only hydrometer readings, and not density, relative density (specific gravity), or API gravity.

3.1.4 *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.

3.1.4.1 *Discussion*—Relative density is also called specific gravity.

3.1.5 *specific gravity*—relative density.

4. Summary of Test Method

4.1 The sample is brought to the testing temperature and transferred to a cylinder at approximately the same temperature. The cylinder and its contents are placed in a constant-temperature bath to avoid excessive temperature variation during the test. The appropriate hydrometer is lowered into the sample and allowed to settle. After temperature equilibrium, the hydrometer is read and the temperature of the sample is noted. The hydrometer reading is converted to the density at 15°C using standard tables.

4.2 The hydrometer reading is corrected to density at 15°C by referring to standard tables.

⁵ *Annual Book of ASTM Standards*, Vol 14.03.