
Standard Method of Test for Specific Gravity or API Gravity of Liquid Asphalts by Hydrometer Method

AASHTO Designation: T 295-22

Technically Revised: 2022

Technical Subcommittee: 2a, Emulsified Asphalts

ASTM Designation: D3142/D3142M-11



**American Association of State Highway and Transportation Officials
555 12th Street NW, Suite 1000
Washington, DC 20004**

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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 that are liquid at room temperature (Note 1). It provides more explicit testing procedures than those in ASTM D1298.
- Note 1**—For materials that are solid or semisolid at room temperature, use T 228 or ASTM D3289.
- 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 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.*
- 1.4. *The quality of the results produced by this standard are dependent on the competence of the personnel performing the procedure and the capability, calibration, and maintenance of the equipment used. Agencies that meet the criteria of R 18 are generally considered capable of competent and objective testing/sampling/inspection/etc. Users of this standard are cautioned that compliance with R 18 alone does not completely assure reliable results. Reliable results depend on many factors; following the suggestions of R 18 or some similar acceptable guideline provides a means of evaluating and controlling some of those factors.*

2. REFERENCED DOCUMENTS

- 2.1. *AASHTO Standards:*
- M 339M/M 339, Thermometers Used in the Testing of Construction Materials
 - R 18, Establishing and Implementing a Quality Management System for Construction Materials Testing Laboratories
 - R 66, Sampling Asphalt Materials
 - T 228, Specific Gravity of Semi-Solid Asphalt Materials
- 2.2. *ASTM Standards:*
- C670, Standard Practice for Preparing Precision and Bias Statements for Test Methods for Construction Materials

- D1250, Standard Guide for Use of the Joint API and ASTM Adjunct for Temperature and Pressure Volume Correction Factors for Generalized Crude Oils, Refined Products, and Lubricating Oils: API MPMS Chapter 11.1
- D1298, Standard Test Method for Density, Relative Density, or API Gravity of Crude Petroleum and Liquid Petroleum Products by Hydrometer Method
- D3289, Standard Test Method for Density of Semi-Solid and Solid Asphalt Materials (Nickel Crucible Method)
- D4311/D4311M, Standard Practice for Determining Asphalt Volume Correction to a Base Temperature
- E1, Standard Specification for ASTM Liquid-in-Glass Thermometers
- E100, Standard Specification for ASTM Hydrometers
- E230/E230M, Standard Specification for Temperature-Electromotive Force (emf) Tables for Standardized Thermocouples
- E879, Standard Specification for Thermistor Sensors for General Purpose and Laboratory Temperature Measurements
- E1137/E1137M, Standard Specification for Industrial Platinum Resistance Thermometers
- E2877, Standard Guide for Digital Contact Thermometers

2.3. *International Electrotechnical Commission Standards:*

- IEC 60584-1: 2013 Thermocouples - Part 1: EMF Specifications and Tolerances
- IEC 60751: 2008 Industrial Platinum Resistance Thermometers and Platinum Temperature Sensors

3. TERMINOLOGY

3.1. *Definitions:*

- 3.1.1. *API gravity*—Asphalt Pavement Institute (API) gravity is a function of specific gravity (SG) 15.6/15.6°C, represented by the following equation: $^{\circ}\text{API} = (141.5/\text{SG } 15.6/15.6^{\circ}\text{C}) - 131.5$
- 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 hydrometer readings only 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.
- 3.1.5. *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 is achieved, the hydrometer is read, and the temperature of the sample is noted. The hydrometer reading is converted to the density at 15°C (60°F) using standard tables.