



Standard Test Methods for Specific Gravity and Density of Halogenated Organic Solvents and Their Admixtures¹

This standard is issued under the fixed designation D 2111; 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.

1. Scope

1.1 These test methods cover the determination of the specific gravity of halogenated organic solvents and solvent admixtures. They define suitable apparatus and procedures and furnish details underlying the interpretation of test data and the selection of numerical limits for agreement among interested persons and agencies.

1.2 Three methods are covered as follows:

1.2.1 *Method A*, specific gravity by means of a hydrometer.

1.2.2 *Method B*, specific gravity and density by means of a pycnometer.

NOTE 1—In referee problems, Method B may be used.

1.2.3 *Method C*, specific gravity and density by means of an electronic densitometer.

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*:

E 1 Specification for ASTM Thermometers²

E 100 Specification for ASTM Hydrometers²

3. Terminology

3.1 *Definitions*:

3.1.1 *specific gravity*—the ratio of the mass in air of a given volume of the material at a stated temperature to the mass in air of an equal volume of distilled water at a stated temperature.

3.1.1.1 *Discussion*—When the temperature of the material and of the water are the same, the specific gravity of the material is expressed as follows:

$$\text{Specific gravity } x/y^{\circ}\text{C, example } 25/25^{\circ}\text{C} \quad (1)$$

¹ These test methods are under the jurisdiction of ASTM Committee D26 on Halogenated Organic Solvents and Fire Extinguishing Agents and are the direct responsibility of Subcommittee D26.04 on Test Methods.

Current edition approved June 10, 2002. Published August 2002. Originally published as D 2111 – 62. Last previous edition D 2111 – 95 (2000).

² *Annual Book of ASTM Standards*, Vol 14.03.

When the temperature of the material and of the water are not the same, the specific gravity of the material is expressed as follows:

Specific gravity $x/y^{\circ}\text{C}$, example 20/4°C (2)

Note that when the density of water is expressed as 4°C, the specific gravity at the stated temperature is the same as density at the stated temperature. For example, SG 20/4°C = density at 20°C.

When using an electronic densitometer to determine specific gravity, the temperature of the material to be tested and the water reference will be the same. Examples 25/25°C, 20/20°C.

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

3.1.2.1 *Discussion*—Density for chlorinated solvents is normally stated in grams per cubic centimetre. Pounds per gallon is also commonly used.

4. Significance and Use

4.1 The density or specific gravity of a pure chlorinated solvent at a given temperature is constant. Density or specific gravity can be used in identification of materials, the assay of binary mixtures, and as an indication of purity of a given solvent.

5. Test Temperatures

5.1 ASTM specifications normally state the temperatures for specific gravity of halogenated organic solvents at 25/25°C. 20/20°C and 60/60°F are other commonly used temperatures.

METHOD A—SPECIFIC GRAVITY BY MEANS OF A HYDROMETER

6. Apparatus

6.1 *Hydrometer*—The hydrometers to be used shall be those specified in Specification E 100, as follows:

Nominal Specific Gravity Range	ASTM Hydrometer No.
0.900 to 0.950	107H
0.950 to 1.000	108H
1.000 to 1.050	125H
1.050 to 1.100	126H
1.100 to 1.150	127H
1.150 to 1.200	128H
1.200 to 1.250	129H
1.250 to 1.300	130H
1.300 to 1.350	131H
1.350 to 1.400	132H
1.400 to 1.450	133H
1.450 to 1.500	134H