



Designation: E100 – 17

Standard Specification for ASTM Hydrometers¹

This standard is issued under the fixed designation E100; 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 U.S. Department of Defense.

1. Scope

1.1 This specification covers glass hydrometers of various scale graduation systems, as required by the ASTM Test Methods in which they are used.

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.*

1.3 *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

D287 Test Method for API Gravity of Crude Petroleum and Petroleum Products (Hydrometer Method)

D3290 Specification for Bond and Ledger Papers for Permanent Records (Withdrawn 2010)³

E1 Specification for ASTM Liquid-in-Glass Thermometers

E77 Test Method for Inspection and Verification of Thermometers

E126 Test Method for Inspection, Calibration, and Verification of ASTM Hydrometers

E344 Terminology Relating to Thermometry and Hydrometry

E2251 Specification for Liquid-in-Glass ASTM Thermometers with Low-Hazard Precision Liquids

¹ This specification is under the jurisdiction of ASTM Committee E20 on Temperature Measurement and is the direct responsibility of Subcommittee E20.05 on Liquid-in-Glass Thermometers and Hydrometers.

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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.

³ The last approved version of this historical standard is referenced on www.astm.org.

E2877 Guide for Digital Contact Thermometers

2.2 Other Standards:

ISO 1768:1975 Glass Hydrometers—Conventional Value for the Thermal Cubic Expansion Coefficient (for Use in the Preparation of Measurement Tables for Liquids)

3. Terminology

3.1 *Definitions*—The definitions given in Terminology E344 apply.

3.2 Definitions of Terms Specific to This Standard:

3.2.1 *ledger paper, n*—a paper characterized by strength, high tearing resistance, erasability, water resistance, ink receptivity, uniformity of surface, and smoothness.

3.2.1.1 *Discussion*—Originally, ledger paper was used especially for pen and ink records. Most ledger papers are surface sized, frequently subjected to appreciable wear, and shall have a high degree of permanence and durability.

3.2.2 *length of the scale, n*—length of the nominal range in the stem, not including graduations extending above and below the nominal limits.

3.2.3 *relative density (formerly specific gravity), n*—ratio of the mass of a given volume of material at a stated temperature to the mass of an equal volume of gas-free distilled water at the same or different temperature. Both reference temperatures shall be explicitly stated.

3.2.3.1 *Discussion*—Common reference temperatures include 60°F/60°F, 20°C/20°C, 20°C/4°C. The historic term specific gravity may still be found.

3.2.3.2 *Discussion*—The reference temperatures for ASTM hydrometers and thermohydrometers are found in Table 1 under the heading “standard temperature”.

3.2.4 *specific gravity, n*—an historic term, replaced by *relative density*.

3.2.4.1 *Discussion*—hydrometers manufactured to this standard may be marked sp. gr., rel. density, or with both designations. The two terms are both equally acceptable in this standard and are used interchangeably.

3.2.5 *thermohydrometer, n*—glass hydrometer having an integral thermometer.

3.2.6 *top of the hydrometer, n*—top of the finished instrument.