



Standard Specification for ASTM Thermometers¹

This standard is issued under the fixed designation E 1; 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 This specification covers liquid-in-glass thermometers graduated in Celsius (centigrade) or Fahrenheit degrees which are frequently specified in methods of ASTM. The various thermometers covered are listed in Table 1. The designation of an IP number in Table 1 indicates, where appearing, that the thermometer specification has been jointly agreed upon by the British Institute of Petroleum (IP) and ASTM.

1.2 This specification also covers adjustable-range enclosed-scale thermometers, graduated in Celsius (centigrade) degrees, which are specified in methods of ASTM.

1.3 The enclosed-scale thermometers are commonly called Beckmann thermometers. They are suitable for measuring small temperature differences not exceeding 6 °C within a larger range of temperature. The thermometers are unsuitable for measuring Celsius- or kelvin-scale temperatures unless they have been compared with standard instruments immediately before use.

1.4 An alphabetic list of the ASTM Thermometers included in this standard is given in Table 2.

1.5 A list of ASTM Thermometers is given in Table 3 to facilitate selection according to temperature range, immersion, and scale-error requirements.

NOTE 1—For a listing of thermometers recommended for general laboratory use, the Scientific Apparatus Makers Assn. Specifications for General Purpose Glass Laboratory Thermometers may be consulted.²

NOTE 2—It has been found by experience that these ASTM Thermometers, although developed in general for specific tests, may also be found suitable for other applications, thus precluding the need for new thermometer specifications differing in only minor features.

2. Referenced Documents

2.1 ASTM Standards:

E 77 Test Method for Inspection and Verification of Thermometers³

E 344 Terminology Relating to Thermometry and Hydrometry³

¹ This specification is under the jurisdiction of ASTM Committee E-20 on Temperature Measurement and is the direct responsibility of Subcommittee E20.05 on Liquid-in-Glass Thermometers and Hydrometers.

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² Available from SAMA Group of Assocs., 225 Reinekers, Ste. 625, Alexandria, VA 22314.

³ Annual Book of ASTM Standards, Vol 14.03.

3. Terminology

3.1 *Definitions*—The definitions given in Terminology E 344 apply.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *adjusting device, n*—a section of the instrument used to adjust the amount of mercury in the bulb and main capillary to that needed for the intended temperature interval.

3.2.2 *bulb length, n*—the distance from the bottom of the bulb to the junction of the bulb and the stem tubing.

3.2.3 *contraction chamber, n*—an enlargement of the capillary, that will appear below the main scale or between the main scale and the auxiliary scale, which serves to reduce its length or to prevent contraction of the liquid column into the bulb.

3.2.4 *diameter, n*—the largest outside dimension of the glass as measured with a ring gage.

3.2.5 *expansion chamber, n*—an enlargement at the top of the capillary to provide protection against breakage caused by excessive gas pressure.

3.2.6 *interval error, n*—the deviation of the nominal value of a temperature interval from its true value; either for the total range (total interval) or for a part of the range (partial interval).

3.2.7 *saddle, n*—the bottom support of the enclosed scale.

3.2.8 *setting temperature, n*—the temperature that yields a reading of zero on the main scale for a given adjustment of the amount of mercury in the bulb and main capillary.

3.2.9 *top of the thermometer, n*—the top of the finished instrument.

3.2.10 *total length, n*—the distance from the bottom of the bulb to the top of the finished thermometer, including any special finish at the top.

3.2.11 Other descriptions of terms shall be in accordance with the Terminology section of Test Method E 77.

Part A—Solid-Stem Thermometers

4. Specifications

4.1 The individual thermometers shall conform to the detailed specifications given in Table 1 and to the general requirements specified in Sections 5-13.

NOTE 3—Such thermometers manufactured prior to the adoption of the specifications will retain the same official status as those meeting current specifications.

NOTE 4—Encapsulating thermometers will change their performance