

AMERICAN SOCIETY FOR TESTING AND MATERIALS

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Standard Method of
MEASURING THE TEMPERATURE OF
PETROLEUM AND PETROLEUM
PRODUCTS¹



API Standard: 2543

ASTM Designation: D 1086 - 64

ADOPTED, 1964.^{2,3}

This standard of the American Petroleum Institute issued under the fixed designation API 2543 is also a standard of the American Society for Testing and Materials issued under the fixed designation D 1086; the final number indicates the year of original adoption as standard, or, in the case of revision, the year of last revision.

Scope

1. This method covers the determination of temperatures of petroleum liquids.

Summary of Method

2. As accurate average temperatures and gage readings are necessary to calculate the volumes at the standard temperature of 60 F, temperatures of petroleum liquids are determined at specified locations in tanks, ships, barges, tank cars, and tank trucks. A summary of the

¹ Under the standardization procedures of the API and the ASTM, this method is under the jurisdiction of the API Central Committee on Petroleum Measurement and the ASTM Committee D-2 on Petroleum Products and Lubricants.

² The API method was adopted as API Standard 2543 in December, 1964.

Prior to their present publication, the API methods of test were issued in December, 1929 as API Code 25. API Code 25 was reissued in 1930, 1931, 1933, 1935, 1940, and 1948. The material was revised and reissued in January, 1955 as API Standard 2500, and the second edition was issued in March, 1961.

³ Revised and adopted as standard August 31, 1964, by action of the ASTM at the Annual Meeting and confirming letter ballot.

Prior to adoption as ASTM standard, this method was published as tentative from 1950 to 1964, being revised in 1952, 1954, 1956, 1960, and 1964.

First published as information in the compilation of "ASTM Standards on Petroleum Products and Lubricants," November, 1948, p. 673; also November, 1949, p. 1362.

thermometer assemblies and temperature levels used for various types of tanks and carriers is shown in Table I. For a nonpressure tank, a temperature is obtained by lowering an ASTM tank thermometer of appropriate range through the gaging hatch to the specified level, and then withdrawing and reading the thermometer quickly after the entire thermometer assembly has attained the temperature of the liquid. This procedure is also used for low-pressure tanks equipped with gaging hatches on standpipes and for any pressure tank which has a pressure lock. For tanks equipped with thermometer wells, temperatures are obtained by reading thermometers placed in the wells with their bulbs at the desired tank levels. For tanks equipped with automatic temperature devices, the temperature is determined merely by observation of a dial, meter, or scale. No manual operations are involved other than the manipulation of a lever or an electrical switch. These devices may be used for temperature determinations on custody change measurements if mutually agreed to by the parties involved. In all cases where more than one temperature is determined, the average temperature of the liquid is calculated from the observed temperatures.

APPARATUS**Thermometers**

3. Total immersion thermometers with etched graduated glass stems and with bulbs made of Corning normal or equivalent thermometric glass, mercury-filled, with nitrogen gas above the mercury column, and conforming to Specifications E 1, for the ASTM Thermometer,⁴ as listed in Table II, shall be used.

Thermometer Assemblies

4. (a) Four types of assemblies are recommended for the ASTM tank thermometers, the particular type used depending on the viscosity of the liquid and the type of tank.

(1) *Cup Case*.—This assembly is illustrated in Fig. 1. The cup case may be made of either varnished hardwood or corrosion-resistant metal, with a cup of at least 100-ml (6.1-cu in.) capacity, and with dimensions such that the side of the bulb will be at least $\frac{3}{8}$ in. from the nearest wall and the bottom of the bulb $1 \pm \frac{1}{16}$ in. above the bottom of the cup. For crude oil, a cup of not less than 25-ml capacity shall be permissible if the distances between the thermometer bulb and the case conform to Fig. 1.

⁴ 1968 Book of ASTM Standards, Part 18.