



Designation: D 1955 – 85 (Reapproved 1995)

Standard Test Method for Gel Time of Drying Oils¹

This standard is issued under the fixed designation D 1955; 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 test method covers the determination of the gel time of tung oil, oiticica oil, and, with modification of temperature, other oils having gelling characteristics.

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.*

2. Referenced Documents

2.1 *ASTM Standards:*

E 1 Specification for ASTM Thermometers²

3. Terminology

3.1 Definition:

3.1.1 *gel time, of a drying oil*—the time required for the oil to form a solid gel under specified conditions of temperature.

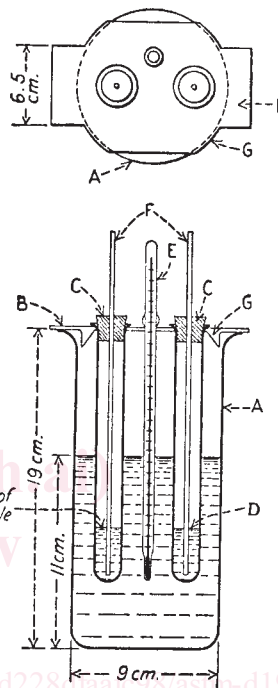
4. Significance and Use

4.1 The gel time of an oil at elevated temperature is an indication of its drying characteristics. Oils that have a high degree of unsaturation are classed as drying oils. Oils in which a high percentage of this unsaturation is conjugated dry the fastest.

4.2 At elevated temperatures, the conjugated oils will form a gel; therefore this test method can be used to detect adulteration in highly conjugated oils such as tung and oiticica oil, whereas unconjugated oils do not show a sharp gel point. The method is empirical in nature since the gel time must be compared to a known standard.

5. Apparatus

5.1 The apparatus shall be assembled as shown in Fig. 1 and shall consist of the following:



- A— 1000-mL, tall-form beaker, 90 mm in diameter by 190 mm in height
- B— support plate about 65 mm in width, made of monel metal, aluminum, or stainless steel
- C— test tubes, 150 mm by 16 mm, with cork stoppers
- D— 5 mL of reference standard oil
- E— thermometer, range 90 to 370°C
- F— glass rods 3 mm in diameter
- G— guide to prevent cover from slipping

FIG. 1 Apparatus for Gel Time Test

5.1.1 *Bath*—A 1000-mL, tall-form beaker, containing a hydrogenated oil or other suitable liquid to a depth of 110 mm. The beaker shall be covered with a Monel, aluminum, or stainless steel support plate for test tubes and thermometer.

5.1.2 *Glass Rods*, approximately 170 mm in length.

5.1.3 *Test Tubes*, 150 by 16 mm with a mark to designate the 5-mL level. Each tube shall be closed with a cork having a hole through which a 3-mm glass rod can move freely.

5.1.4 *Thermometer*—An ASTM Pensky-Martens High-Range Thermometer having a range from 90 to 370°C and

¹ This test method is under the jurisdiction of ASTM Committee D-1 on Paint and Related Coatings, Materials, and Applications and is the direct responsibility of Subcommittee D01.32 on Drying Oils.

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