



Designation: D 1964 – 85 (Reapproved 1995)^{ε1}

Standard Test Method for Tung Oil Quality¹

This standard is issued under the fixed designation D 1964; 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.

^{ε1} NOTE—Unit of measurement statement was added editorially in May 1995.

1. Scope

1.1 This test method covers the determination of the quality of tung oil by distinguishing between pure and adulterated oil. The test method is not applicable to oils other than tung oil.

1.2 The values stated in SI units are to be regarded as the standard. The values given in parentheses are for information only.

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

3. Significance and Use

3.1 Since tung oil contains a high degree of conjugated unsaturation, it will form a dry gel when subjected to elevated temperatures for a relatively short time. This test method is designed to detect adulteration of tung oil with less conjugated oils, since an adulterated tung oil will require a longer gel time and will give a gel that is soft and sticky.

3.2 This test method is extremely temperature sensitive and therefore the temperature must be accurately controlled.

4. Apparatus

4.1 *Casserole*—An ordinary vitreous-enameled iron casserole having a bottom diameter of 75 mm (3 in.).

4.2 *Tripod*, wide-flange, with a 75-mm (3-in.) opening.

NOTE 1—The object of the flange is to prevent superheating of the sides of the casserole.

4.3 *Thermometer*—An ASTM Low Distillation Thermometer having a range from – 2 to 300°C and conforming to the requirements for Thermometer 7C as prescribed in Specification E 1.

5. Procedure

5.1 Weigh 150 g of the oil into the casserole and heat so that the temperature reaches 282°C in 4 min ± 30 s while stirring with the thermometer. Turn down the flame and maintain the temperature at 282 ± 1°C. Stir with the thermometer until, on lifting the thermometer, the oil drops with a pronounced string, showing that polymerization has started. The time required after reaching 282 ± 1°C until the string is noted is the time of the heat test. For pure tung oils this will not exceed 8 min.

5.2 As soon as the oil strings, turn off the flame and remove the thermometer. Stir with a stiff spatula until the oil is solid. After stringing, a pure tung oil will require not over 40 s to become solid.

5.3 When the oil has solidified, allow to stand exactly 1 min. Turn out upside down on clean paper and cut at once with a clean spatula. Pure tung oil gives a gel that is dry, not adhering to the spatula when cut. It is firm, crumbling under pressure of the spatula, without sticking. The crumbs should have an appearance like dry bread crumbs. Adulterated tung oil gives a gel that is soft and sticky and does not crumble.

6. Precision and Bias

6.1 Precision and bias data were not established at the time this test method was written. This test method has been in use for many years and its usefulness has been well established.

7. Keywords

7.1 tung oil

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.



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