



Standard Test Method for Iodine Value of Drying Oils and Fatty Acids¹

This standard is issued under the fixed designation D 1959; 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 Wijs procedure for determination of unsaturation (iodine value) in drying oils. It is applicable to all natural and synthetic drying oils and their fatty acids.

1.2 When the iodine value is determined on oils or fatty acids having conjugated systems, the result is not a measure of total unsaturation, but rather is an empirical value that affords a comparison of total unsaturation.

1.3 To obtain the total iodine value on conjugated samples, use Test Method D 1541.

NOTE 1—This test method is essentially equivalent to Test Methods D 2075 and D 2078.

1.4 *This standard may involve hazardous materials, operations, and equipment. This standard does not purport to address all of the safety problems 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.* For specific hazard statements, see Section 8.

2. Referenced Documents

2.1 ASTM Standards:

D 1193 Specification for Reagent Water²

D 1541 Test Method for Total Iodine Value of Drying Oils and Their Derivatives³

D 2075 Test Method for Iodine Value of Fatty Amines, Amidoamines, and Diamines³

D 2078 Test Method for Iodine Value of Fatty Quarternary Ammonium Chlorides³

D 5768 Test Method for Iodine Value of Tall Oil Fatty Acids³

3. Terminology

3.1 Definitions:

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 D 01.32 on Drying Oils.

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² Annual Book of ASTM Standards, Vol 11.01.

³ Annual Book of ASTM Standards, Vol 06.03.

3.1.1 *iodine value*—a measure of the unsaturation of oils and fatty acids and is expressed in terms of the number of centigrams of iodine per gram of sample (weight percent of absorbed iodine).

3.1.1.1 *Discussion*—Total unsaturation of conjugated systems may be measured in accordance with Test Method D 1541. The Wijs iodine value method is not reliable for tall oil fatty acids containing an appreciable quantity of rosin acids.

4. Summary of Test Method

4.1 The determination of the iodine value of oils containing isolated double bonds is based on the absorption of halogen under conditions selected to promote stoichiometrical results.

5. Significance and Use

5.1 This test method measures the unsaturation as iodine value by addition of an iodine/chlorine reagent. The amount of reagent absorbed is determined by back titrating the excess reagent and comparing it to a blank determination.

5.2 In samples containing conjugated double bonds, the iodine value obtained is empirical since the reagent does not react stoichiometrically with conjugated unsaturation. Where no conjugation is present, the iodine value obtained is a measure of the total unsaturation. By using proper specimen weights, the empirical values obtained are useful for comparative purposes.

6. Apparatus

6.1 *Bottles*—Glass-stoppered bottles or wide-mouth (Note 2) Erlenmeyer flasks of 500-mL capacity.

NOTE 2—Wide-mouth bottles or flasks are essential if stirring is done by mechanical means.

6.2 *Pipets*, 20 and 25-mL capacity.

7. Reagents

7.1 *Purity of Reagents*—Reagent grade chemicals shall be used in all tests unless otherwise specified. Unless otherwise indicated, it is intended that all reagents shall conform to the Specifications of the Committee on Analytical Reagents of the