



Standard Test Method for Ester Value of Solvents and Thinners¹

This standard is issued under the fixed designation D1617; 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 ester value of solvents and thinners used in lacquers and other coatings.

1.2 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

1.3 For purposes of determining conformance of an observed or a calculated value using this test method to relevant specifications, test result(s) shall be rounded off “to the nearest unit” in the last right-hand digit used in expressing the specification limit, in accordance with the rounding-off method of Practice E29.

1.4 *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.* For a specific hazard statement, see 8.6.

1.5 For hazard information and guidance, see the supplier’s Material Safety Data Sheet.

2. Referenced Documents

2.1 *ASTM Standards:*²

D1193 Specification for Reagent Water

E29 Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications

3. Summary of Test Method

3.1 The specimen is reacted with a measured excess of aqueous potassium hydroxide, using isopropanol as a mutual solvent if necessary. The amount of potassium hydroxide

consumed, which is determined by titrating the excess with standard mineral acid, is a measure of the ester originally present.

3.2 Since this determination is based on an acidimetric titration, a suitable correction should be applied if the acidity of the sample exceeds the limit of the specification.

4. Significance and Use

4.1 This test method is useful in determining the assay of solvents and thinners which are esters or solutions of esters of carboxylic acid. The ester value is calculated as percent ester. This test method has its greatest application where the solvent or thinner is not a pure ester. This test method may be used in assessing compliance to specification.

5. Interferences

5.1 Organic chlorides, nitriles, and amides may be hydrolyzed by the reagent, particularly at 98°C, and are a possible source of error. Ketones interfere only slightly with this procedure. Aldehydes consume some alkali, but the error introduced by small amounts is negligible.

6. Apparatus

6.1 *Pressure Bottle*, 200 to 350-mL capacity, made from heat-resistant glass.

6.2 *Container for Pressure Bottle*—A suitable safety device to contain the pressure bottle. A metal container with hinged top and perforated bottom, a strong synthetic fabric or canvas bag, or a safety shield may be used.

6.3 *Ampoule*, 1 or 2-mL capacity.

6.4 *Weighing Pipet*, Lunge or similar type.

6.5 *Erlenmeyer Flasks*, 250-mL glass-stoppered.

6.6 *Buret*, 50-mL capacity.

6.7 *Boiling Water Bath*.

7. Reagents

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

¹ This test method is under the jurisdiction of ASTM Committee D01 on Paint and Related Coatings, Materials, and Applications and is the direct responsibility of Subcommittee D01.35 on Solvents, Plasticizers, and Chemical Intermediates.

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard’s Document Summary page on the ASTM website.

*A Summary of Changes section appears at the end of this standard