



**Designation: D 1617 – 90 (Reapproved 1996)**

AMERICAN SOCIETY FOR TESTING AND MATERIALS  
100 Barr Harbor Dr., West Conshohocken, PA 19428  
Reprinted from the Annual Book of ASTM Standards. Copyright ASTM

## Standard Test Method for Ester Value of Solvents and Thinners<sup>1</sup>

This standard is issued under the fixed designation D 1617; 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 ( $\epsilon$ ) 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 *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 Note 2.

1.3 For hazard information and guidance, see the supplier's Material Safety Data Sheet.

### 2. Referenced Documents

2.1 *ASTM Standards:*

D 1193 Specification for Reagent Water<sup>2</sup>

### 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 hydro-

lyzed 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*,<sup>3</sup> 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, where such specifications are available.<sup>4</sup> Other grades may be used provided it is first ascertained that the reagent is of sufficiently high purity to permit its use without lessening the accuracy of the determination.

7.2 *Purity of Water*—Unless otherwise indicated, references to water shall be understood to mean reagent water conforming to Type IV of Specification D 1193.

7.3 *Hydrochloric Acid, Standard (0.5 N)*—Prepare 0.5 N hydrochloric acid (HCl) and standardize to four significant figures.

7.4 *Isopropyl Alcohol (99 %)*.

7.5 *Phenolphthalein Indicator Solution*—Dissolve 1 g of phenolphthalein in 100 mL of methanol, ethanol, or isopropyl alcohol.

<sup>3</sup> Bottles of this type, equipped with lever-type closures, can be obtained from Preiser Scientific, PO Box 1330, 94 Oliver St., St. Albans, WV 25177.

<sup>4</sup> *Reagent Chemicals, American Chemical Society Specifications*, American Chemical Society, Washington, DC. For suggestions on the testing of reagents not listed by the American Chemical Society, see *Analar Standards for Laboratory Chemicals*, BDH Ltd., Poole, Dorset, U.K., and the *United States Pharmacopoeia and National Formulary*, U.S. Pharmaceutical Convention, Inc. (USPC), Rockville, MD.

<sup>1</sup> 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 D01.35 on Solvents, Plasticizers, and Chemical Intermediates.

Current edition approved May 25, 1990. Published July 1990. Originally published as D 1617 – 58 T. Last previous edition D 1617 – 85.

<sup>2</sup> *Annual Book of ASTM Standards*, Vol 11.01.