



Standard Test Method for Alcohol Content and Purity of Acetate Esters by Gas Chromatography¹

This standard is issued under the fixed designation D3545; 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 U.S. Department of Defense.

1. Scope*

1.1 This test method covers the determination by gas chromatography of the ester content and the corresponding alcohol content of acetate esters. This test method has been applied to ethyl, *n*-propyl, isopropyl, *n*-butyl, isobutyl, and 2-ethoxyethyl acetates.

1.2 Water, and in some cases acetic acid, cannot be determined by this test method and must be measured by other appropriate ASTM procedures and the results used to normalize the chromatographic value.

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

1.5 For specific hazard information and guidance, see the supplier’s Material Safety Data Sheet for material listed in this specification.

1.6 *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:²

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.

D1364 Test Method for Water in Volatile Solvents (Karl Fischer Reagent Titration Method)

D1613 Test Method for Acidity in Volatile Solvents and Chemical Intermediates Used in Paint, Varnish, Lacquer, and Related Products

D2593 Test Method for Butadiene Purity and Hydrocarbon Impurities by Gas Chromatography

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

E180 Practice for Determining the Precision of ASTM Methods for Analysis and Testing of Industrial and Specialty Chemicals (Withdrawn 2009)³

E260 Practice for Packed Column Gas Chromatography

3. Summary of Test Method

3.1 A representative specimen is introduced into a gas-liquid partition column. The acetate is separated from impurities such as alcohols, other esters, ethers, and several unidentified compounds while the components are transported through the column by an inert carrier gas. The separated components are measured in the effluent by a detector and recorded as a chromatogram. The chromatogram is interpreted by applying component attenuation and detector response factors to the peak areas, and the relative concentrations are determined by relating the individual peak responses to the total peak response. Water and acidity are measured by Test Methods D1364 and D1613, respectively, and the results are used to normalize the values obtained by gas chromatography.

4. Significance and Use

4.1 This test method is useful for identifying and for determining the quantity of various impurities in acetate esters.

4.2 Total purity of the acetate esters must be determined by use of other appropriate ASTM procedures with this test method.

5. Apparatus

5.1 *Chromatograph*—Any gas chromatograph having either a thermal conductivity or flame ionization detector, provided

³ The last approved version of this historical standard is referenced on www.astm.org.