Designation: D871 – 96 (Reapproved 2010)

Standard Test Methods of Testing Cellulose Acetate[1]

This standard is issued under the fixed designation D871; 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 These test methods cover procedures for testing cellulose acetate.

1.2 The test procedures appear in the following sections:

	Sections
Ash	8 to 11
Color and Haze	67 to 72
Combined Acetyl or Acetic Acid Content	
Test Method A. Solution Method	17, 19 to 23
Test Method B. Heterogeneous Saponification Method	17, 24 to 26
Free Acidity	12 to 16
Heat Stability	47 to 56
Hydroxyl Content	27 to 33
Intrinsic Viscosity	57 to 62
Moisture Content	4 to 7
Primary Hydroxyl Content	34 to 39
Sulfur or Sulfate Content	40 to 45
Viscosity	63 to 66

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

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.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

D1193 Specification for Reagent Water

D1343 Test Method for Viscosity of Cellulose Derivatives by Ball-Drop Method

D2929 Test Method for Sulfur Content of Cellulosic Materials by X-Ray Fluorescence

D5897 Test Method for Determination of Percent Hydroxyl on Cellulose Esters by Potentiometric Titration—Alternative Method

3. Purity of Reagents

3.1 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.[3] 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.

3.2 Unless otherwise indicated, references to water shall be understood to mean reagent tared, low, wide-form weighing bottle and water, conforming to Specification D1193.

MOISTURE CONTENT

4. Significance and Use

4.1 Moisture content of the cellulose ester can be used to estimate the dry weight of the cellulose ester. Since cellulose esters are desiccants, their moisture content can vary greatly depending on storage.

5. Procedure

5.1 Transfer about 5 g of the sample to a tared, low, wide-form weighing bottle and weigh to the nearest 0.001 g. Dry in an oven for 2 h at 105 ± 3°C. Remove the bottle from the oven, cover, cool in a desiccator, and weigh.

6. Calculation

6.1 Calculate the percentage of moisture as follows:

$$\text{Moisture, \%} = (A/B) \times 100$$

where:

A = weight loss on heating, g, and

[1] These test methods are under the jurisdiction of ASTM Committee D01 on Paint and Related Coatings, Materials, and Applications and are the direct responsibility of Subcommittee D01.36 on Cellulose and Cellulose Derivatives.

Current edition approved June 1, 2010. Published July 2010. Originally approved in 1946. Last previous edition approved in 2004 as D871 – 96 (2004). DOI: 10.1520/D0871-96R10.

[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.

[3] *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 Pharmacopeia and National Formulary*, U.S. Pharmacopeial Convention, Inc. (USPC), Rockville, MD.

Copyright © ASTM International, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, PA 19428-2959. United States