Designation: D 817 – 96

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 Methods of Testing Cellulose Acetate Propionate and Cellulose Acetate Butyrate[1]

This standard is issued under the fixed designation D 817; 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.

1. Scope

1.1 These test methods cover procedures for the testing of cellulose acetate propionates and acetate butyrates. These esters may vary widely in composition and properties, so certain of the procedures can be used only in the ranges of composition where they are suitable.

1.2 The test procedures appear in the following sections:

	Sections
Acetyl Propionyl or Butyryl Contents	28-37
Acetyl Content, Apparent	18-27
Acidity, Free	12-17
Ash	7-10
Color and Haze	77-81
Heat Stability	57-65
Hydroxyl Content	38-44
Hydroxyl Content, Primary	46-50
Intrinsic Viscosity	67-71
Moisture Content	5-6
Sulfur or Sulfate Content	51-56
Viscosity	74-75
Limiting Viscosity Number	67-71

1.3 *This standard does not purport to address 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:*

D 618 Practice for Conditioning Plastics and Electrical Insulating Materials for Testing[2]

D 1343 Test Method for Viscosity of Cellulose Derivatives by Ball-Drop Method[3]

D 2929 Test Method for Sulfur Content of Cellulosic Materials by X-Ray Fluorescence[3]

D 5897 Test Method for Determination of Percent Hydroxyl on Cellulose Esters by Potentiometric Titration—Alternative Method[3]

3. Reagents

3.1 *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.[4] 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.

4. Conditioning

4.1 *Conditioning*—Condition the test specimens at 23 ± 2°C (73.4 ± 3.6°F) and 50 ± 5 percent relative humidity for not less than 40 h prior to test in accordance with Procedure A of Methods D 618, for those tests where conditioning is required. In cases of disagreement, the tolerances shall be ± 1°C (±1.8°F) and ±2 percent relative humidity.

4.2 *Test Conditions*—Conduct tests in the Standard Laboratory Atmosphere of 23 ± 2°C (73.4 ± 3.6°F) and 50 ± 5 % relative humidity, unless otherwise specified in the test methods. In cases of disagreements, the tolerances shall be ±1°C (±1.8°F) and± 2 % relative humidity.

MOISTURE CONTENT

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:

$$\text{Moisture, } \% = (A/B) \times 100 \quad (1)$$

where:

A = weight loss on heating, g, and

[1] These test methods are under the jurisdiction of ASTM Committee D-1 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 Nov. 10, 1996. Published January 1997. Originally published as D 817 – 44 T. Last previous edition D 817 – 91.

[2] *Annual Book of ASTM Standards*, Vol 08.01.

[3] *Annual Book of ASTM Standards*, Vol 06.03.

[4] *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.