



Standard Test Method for Dilution Ratio of Active Solvents in Cellulose Nitrate Solutions¹

This standard is issued under the fixed designation D 1720; 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 volume ratio of hydrocarbon diluent to active solvent required to cause persistent heterogeneity (precipitation) in a solution of cellulose nitrate.

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 specific hazard statements, see Section 6.

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

2. Referenced Documents

2.1 *ASTM Standards:*

D 301 Test Methods for Soluble Cellulose Nitrate²

D 841 Specification for Nitration Grade Toluene³

D 4615 Specification for *n*-Butyl Acetate (All Grades)³

3. Terminology

3.1 *Definitions of Terms Specific to This Standard:*

3.1.1 *dilution ratio*—the maximum number of unit volumes of a diluent that can be added to a unit volume of solvent to cause the first persistent heterogeneity (precipitation) in the solution at a concentration of 8 g cellulose nitrate per 100 mL of combined solvent plus diluent and at a temperature of 25 \pm 3°C.

NOTE 1—The dilution ratio decreases as the cellulose nitrate concentration at the end point increases. It is, therefore, necessary to set an arbitrary concentration of cellulose nitrate as part of the dilution ratio term. For this purpose 8.0 g of cellulose nitrate per 100 mL of solvent plus diluent has been adopted.

4. Significance and Use

4.1 By use of standard or reference grade materials for any

two of the three components, namely, oxygenated solvent, diluent, or cellulose nitrate, the effect of different batches or different types of the third component can be determined.

4.2 This test method is applicable for the determination of the following:

4.2.1 The dilution ratio of toluene as the standard diluent to an oxygenated solvent under test, using as the solute standard cellulose nitrate as defined in 5.2.

4.2.2 The dilution ratio of a hydrocarbon diluent under test to *n*-butyl acetate as the standard solvent, using as a solute standard cellulose nitrate as defined in 5.2.

4.2.3 The dilution ratio of toluene, as the standard diluent, to *n*-butyl acetate as the standard solvent, using as the solute cellulose nitrate of varying solubility characteristics.

5. Materials

5.1 *n*-Butyl Acetate (90 to 92 %), conforming to Specification D 4615.

NOTE 2—This grade of *n*-butyl acetate contains 8 to 10 % *n*-butyl alcohol.

5.2 *Cellulose Nitrate*, conforming to the Sampling section (Appearance, Ash, and Stability requirements) of Methods D 301 and of such quality that, when used in determining the toluene dilution ratios of *n*-butyl acetate and methyl *n*-propyl ketone, it will give results between the following limits:

Toluene Dilution Ratio

<i>n</i> -butyl acetate	2.73 to 2.83
methyl <i>n</i> -propyl ketone	3.80 to 3.90

5.3 *Toluene (Toluol)*, conforming to Specification D 841.

6. Hazards

6.1 Soluble cellulose nitrate is a flammable material, the degree of flammability varying with the extent and nature of the wetting medium. Cellulose nitrate is always wet with water or alcohol in commercial handling, shipping, and storage, in which condition it presents no unusual hazard. Dry cellulose nitrate, if ignited by fire, spark, or static electricity, burns very rapidly. Do not store samples of dry cellulose nitrate at any time. Dry only that portion required for immediate test. Wear a face shield when the oven is opened after samples have been heated. Wet excess material and the samples left after testing with water and dispose of properly.

¹ 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.

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² *Annual Book of ASTM Standards*, Vol 06.03.

³ *Annual Book of ASTM Standards*, Vol 06.04.