



Designation: D 4665 - 87

An American National Standard

AMERICAN SOCIETY FOR TESTING AND MATERIALS

1916 Race St., Philadelphia, Pa. 19103

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Standard Test Method for POLYURETHANE RAW MATERIALS: DETERMINATION OF ASSAY OF ISOCYANATES¹

This standard is issued under the fixed designation D 4665; 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 This test method determines the amount of toluene diisocyanate (TDI) in refined toluene-2,4-diisocyanate and toluene-2,6-diisocyanate or mixtures of the two. Other isomers, if present, will be included in the determination. This test method may also be applied to other isocyanates of suitable reactivity and solubility.

1.2 *This standard may involve hazardous materials, operations, and equipment. This standard does not purport to address all of the safety problems 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 warning and precautionary statements see Note 1.

2. Referenced Documents

2.1 ASTM Standards:

D 841 Specification for Nitration Grade Toluene²

D 1193 Specification for Reagent Water³

3. Definition

3.1 *assay*—the percentage by weight of TDI present in the sample.

4. Summary of Test Method

4.1 The TDI reacts with dibutylamine to form a urea. The excess amine is determined by back-titration with hydrochloric acid.

5. Significance and Use

5.1 This test method can be used for research or for quality control to help determine the purity of TDI that is used in polyurethane products.

6. Interferences

6.1 Phosgene, the carbamoyl chloride of TDI, hydrogen chloride, and other acidic or basic compounds will interfere. However, in refined isocyanates, these compounds are usually present in such low amounts that they do not affect the determination.

7. Apparatus

7.1 *Lunge Pipet*, or any weighing device that can weigh a liquid by difference to the nearest 0.001 g.

7.2 *Cooling Bath*—Any container about 50 mm deep filled with ice and water.

8. Reagents and Materials

8.1 *Purity of Reagents*—Use reagent grade chemicals in all tests. Unless otherwise indicated, it is intended that all reagents 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.

¹ This test method is under the jurisdiction of ASTM Committee D-20 on Plastics and is the direct responsibility of Subcommittee D20.22 on Cellular Plastics.

Current edition approved Feb. 27, 1987. Published April 1987.

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

³ *Annual Book of ASTM Standards*, Vol 11.01.

⁴ "Reagent Chemicals, American Chemical Society Specifications," Am. Chemical Soc., Washington, DC. For suggestions on the testing of reagents not listed by the American Chemical Society, see "Reagent Chemicals and Standards," by Joseph Rosin, D. Van Nostrand Co., Inc., New York, NY, and the "United States Pharmacopeia."