



Standard Test Methods for Polyurethane Raw Materials: Determination of the Isocyanate Content of Aromatic Isocyanates¹

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^{ε1} NOTE—Editorially corrected Eq 2 in January 2016.

1. Scope*

1.1 These test methods measure the isocyanate content of aromatic isocyanates used as polyurethane raw materials.

1.1.1 *Test Method A*—Unheated toluene-dibutylamine determines the toluene diisocyanate content, the amine equivalent and the isocyanate content of 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 is also applicable to other isocyanates of suitable reactivity and solubility.

1.1.2 *Test Method B*—Heated toluene-dibutylamine determines the amine equivalent and the isocyanate content of crude or modified isocyanates derived from toluene diisocyanate, methylene di-(4-phenylisocyanate) and polymeric (methylene phenylisocyanate).

1.1.3 *Test Method C*—Unheated trichlorobenzene-toluene-dibutylamine determines the amine equivalent and the isocyanate content of crude or modified isocyanates derived from toluene diisocyanate, methylene-di-(4-phenylisocyanate) and polymeric (methylene phenylisocyanate).

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

1.3 *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.*

NOTE 1—Method C of this test method is equivalent to Method B of ISO 14896.

¹ These test methods are under the jurisdiction of ASTM Committee D20 on Plastics and are the direct responsibility of Subcommittee D20.22 on Cellular Materials - Plastics and Elastomers.

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2. Referenced Documents

2.1 ASTM Standards:²

D883 Terminology Relating to Plastics

D1193 Specification for Reagent Water

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Practice for Determining the Precision of ASTM Methods for Analysis and Testing of Industrial and Specialty Chemicals (Withdrawn 2009)³

E691 Practice for Conducting an Interlaboratory Study to Determine the Precision of a Test Method

2.2 ISO Standard:

ISO 14896 Polyurethane Raw Materials-Determination of Isocyanate Content

3. Terminology

3.1 *Definitions*—For definitions of terms that appear in this test method, refer to Terminology D883.

3.2 Definitions of Terms Specific to This Standard:

3.2.1 *amine equivalent*—the weight of sample that will combine with 1.0-g equivalent weight of dibutylamine.

3.2.2 *assay*—the percent by weight of toluene diisocyanate present in the sample.

3.2.3 *isocyanate (NCO) content*—the percent by weight of NCO groups present in the sample.

4. Summary of Test Methods

4.1 All three test methods react the isocyanate sample with an excess amount of dibutylamine to form the corresponding urea. The NCO content is determined from the amount of dibutylamine consumed in the reaction. The test methods differ in the reaction conditions, or solvents used, or both.

4.1.1 *Test Method A*—The sample is added to an excess amount of dibutylamine in toluene and allowed to stand at room temperature for 15 min. The reaction mixture is diluted

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

*A Summary of Changes section appears at the end of this standard