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Standard Test Methods for Testing Polyurethane Raw Materials: Determination of Hydroxyl Numbers of Polyols¹

This standard is issued under the fixed designation D4274; 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 measure the hydroxyl groups in polyester and polyether polyols containing primary and secondary hydroxyl groups. They also apply to many other hydroxyl-containing substances.

1.1.1 *Test Method A—Acetic Anhydride Pressure Bottle*, recommended for polyesters.

1.1.2 *Test Method B—Phthalic Anhydride Pressure Bottle*, recommended for polyethers and polyesters.

1.1.3 *Test Method C—Phthalic Anhydride Reflux*, recommended for polyethers and polyesters.

1.1.4 *Test Method D—Imidazole—Catalyzed Phthalic Anhydride Pressure Bottle*, recommended for polyethers, polyesters, polymer polyols, and amine-initiated polyols.

1.1.5 *Test Method E—Imidazole—Catalyzed Pyromellitic Dianhydride Esterification*, recommended for polyols used for flexible and rigid polyurethane foams and urethane elastomers. It is recommended for polyester polyols, polyether polyols, amine-started polyols, and polymer polyols (polyacrylonitrile/copolyethylene-based).

1.2 Another ASTM test method for measuring hydroxyl groups is Test Method [E222](#).

1.3 The values stated in SI units are to be regarded as the standard.

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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

NOTE 1—This standard, ISO 14900 and ISO 6796 address the same subject matter, but differ in technical content.

1.5 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the*

Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.

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

[E200](#) Practice for Preparation, Standardization, and Storage of Standard and Reagent Solutions for Chemical Analysis

[E203](#) Test Method for Water Using Volumetric Karl Fischer Titration

[E222](#) Test Methods for Hydroxyl Groups Using Acetic Anhydride Acetylation

[E456](#) Terminology Relating to Quality and Statistics

[E691](#) Practice for Conducting an Interlaboratory Study to Determine the Precision of a Test Method

[E2935](#) Practice for Evaluating Equivalence of Two Testing Processes

2.2 ISO Standard:⁴

[ISO 6796](#) Polyglycols for Industrial Use—Determination of Hydroxyl Number—Phthalic Anhydride Esterification Method

[ISO 14900](#) Plastics—Polyols for Use in the Production of Polyurethane—Determination of Hydroxyl Number

3. Terminology

3.1 *Definitions*—Terms used in this standard are defined in accordance with Terminology [D883](#), unless otherwise specified. For terms relating to precision and bias and associated issues, the terms used in this standard are defined in accordance with Terminology [E456](#).

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

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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.

⁴ Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036, <http://www.ansi.org>.

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