



Standard Test Methods for Polyurethane Raw Materials: Determination of Acid and Alkalinity Numbers of Polyols¹

This standard is issued under the fixed designation D4662; 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 acidic and basic constituents in polyols and other materials of high acidity or alkalinity that are soluble in mixtures of toluene and ethyl alcohol. These test methods do not apply to polyethers. (See [Note 1](#).)

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.*

NOTE 1—There is no known ISO equivalent to this standard.

2. Referenced Documents

2.1 *ASTM Standards:*²

[D883 Terminology Relating to Plastics](#)

[D1193 Specification for Reagent Water](#)

3. Terminology

3.1 *Definitions*—For definitions of terms used in these test methods see Terminology [D883](#).

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *acid number*—the quantity of base, expressed in milligrams of potassium hydroxide, that is required to titrate acidic constituents present in 1 g of sample.

3.2.2 *alkalinity number*—the quantity of base, expressed as milligrams of potassium hydroxide, present in 1 g of sample.

4. Summary of Test Method

4.1 The sample is dissolved in a mixture of toluene and ethyl alcohol. The resulting single-phase solution is titrated at

room temperature with alcoholic potassium hydroxide solution, to the end point indicated by the color change of added phenolphthalein. Alkalinity numbers are determined by back-titration after adding excess hydrochloric acid. The end-point of these titrations also can be determined potentiometrically.

5. Significance and Use

5.1 These test methods are suitable for quality control, as specification tests, and for research. The acid and alkalinity numbers indicate the extent of a reaction with acids. The results are measures of batch-to-batch uniformity and are typically used as correction factors in calculating hydroxyl number.

6. Reagents and Materials

6.1 *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.³ Other grades are allowed, provided it is first ascertained that the reagent is of sufficiently high purity to permit its use without lessening the accuracy of the determination.

6.2 *Purity of Water*—Unless otherwise indicated, references to water shall be understood to mean reagent water as defined by Type I of Specification [D1193](#).

6.3 *Ethyl Alcohol, 95 %*.

6.4 *Hydrochloric Acid (0.1 N)*—Prepare a 0.1 N solution of hydrochloric acid (HCl). Standardization is unnecessary.

6.5 *Phenolphthalein Indicator Solution*—Dissolve 0.5 g of phenolphthalein in 100 mL of a mixture of equal volumes of water and ethyl alcohol. Add a slight excess of 0.1 N NaOH solution (pink color) and then just neutralize (colorless) with 0.1 N HCl.

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.

Current edition approved Sept. 1, 2015. Published September 2015. Originally approved in 1987. Last previous edition approved in 2011 as D4662 - 08(2011)^{e1}. DOI: 10.1520/D4662-15.

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 *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.

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