



Designation: D 1726 – 90 (Reapproved 1996)

## Standard Test Methods for Hydrolyzable Chloride Content of Liquid Epoxy Resins<sup>1</sup>

This standard is issued under the fixed designation D 1726; 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 ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

### 1. Scope

1.1 These test methods cover the determination of the easily hydrolyzable chloride content of liquid epoxy resins which are defined as the reaction product of a chlorohydrin and a di- or polyfunctional phenolic compound.

1.1.1 In Test Method A, the easily hydrolyzable chloride is saponified with potassium hydroxide and directly titrated with hydrochloric acid. This test method can be used for concentrations of 1 weight % and below.

1.1.2 In Test Method B, the easily hydrolyzable chloride is again saponified with potassium hydroxide, then titrated potentiometrically with silver nitrate. This test method can be used for concentrations of 5 to 2500 ppm hydrolyzable chloride.

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 Sections 8 and 14.

### 2. Referenced Documents

2.1 *ASTM Standards:*

D 841 Specification for Nitration Grade Toluene<sup>2</sup>

D 1193 Specification for Reagent Water<sup>3</sup>

### 3. Summary of Test Method

3.1 The sample is refluxed in the presence of a known amount of 0.1 N alcoholic potassium hydroxide. The amount of potassium hydroxide consumed in the hydrolysis is a measure of the hydrolyzable chloride content of the resin.

### 4. Significance and Use

4.1 The hydrolyzable chloride content of liquid epoxy resins is an important variable in determining their reactivity and the properties of coatings made from them. These test methods may be used to determine the hydrolyzable chloride content of

manufactured epoxy resins and confirm the stated hydrolyzable chloride content of purchased epoxy resins.

### 5. Apparatus

5.1 *Reflux Apparatus*, consisting of a 250-mL Erlenmeyer flask attached to a reflux condenser and a hot plate with variable heat control.

### 6. Purity of Reagents

6.1 *Purity of Reagents*—Reagent grade chemicals shall be used in all tests. Unless otherwise indicated, it is intended that all reagents shall conform to the specifications of the Committee on Analytical Reagents of the American Chemical Society,<sup>4</sup> where such specifications are available. 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.

6.2 *Purity of Water*—Unless otherwise indicated, references to water shall be understood to mean reagent water conforming to Type II of Specification D 1193.

## TEST METHOD A

### 7. Reagents and Materials

7.1 *Hydrochloric Acid, Standard (0.1 N)*—Dilute 9 mL of concentrated hydrochloric acid (HCl, sp gr 1.19) to 1 L with water. Standardize against 0.25 g of sodium carbonate ( $\text{Na}_2\text{CO}_3$ ) accurately weighed and dissolved in 75 to 100 mL of water.

7.2 *Methyl Ethyl Ketone*.

7.3 *Phenolphthalein Indicator Solution*—Dissolve 1 g of phenolphthalein in 100 mL of methanol, ethanol, or isopropanol.

7.4 *Potassium Hydroxide, Alcohol Solution (0.1 N)*—Dissolve 5.5 to 6.0 g of potassium hydroxide (KOH) in 1 L of methanol (99 %) or ethanol conforming to Formula No. SD-30 of the U.S. Bureau of Internal Revenue. No standardization of the solution is necessary.

<sup>1</sup> 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 D01.33 on Polymers and Resins.

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<sup>2</sup> *Annual Book of ASTM Standards*, Vol 06.04.

<sup>3</sup> *Annual Book of ASTM Standards*, Vol 11.01.

<sup>4</sup> *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.