



Standard Test Method for Acid Value of Organic Coating Materials¹

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This standard has been approved for use by agencies of the Department of Defense.

^{ε1} NOTE—Keywords were added editorially in October 1996.

1. Scope

1.1 This test method covers the measurement of the free acidity present in the nonvolatile portion of varnishes, oils, certain resins, and paint vehicles, by the reaction with standard alkali solution.

1.2 If carboxylic anhydrides are present, only one half of the reactive groups will be titrated and indicated by this test method.

1.3 *This standard does not purport to address 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.*

2. Referenced Documents

2.1 ASTM Standards:

D 362 Specification for Industrial Grade Toluene²

D 770 Specification for Isopropyl Alcohol³

D 1259 Test Methods for Nonvolatile Content of Resin Solutions⁴

D 1644 Test Methods for Nonvolatile Content of Varnishes⁴

D 1960 Test Method for Loss on Heating of Drying Oils⁵

3. Terminology

3.1 Definitions:

3.1.1 *acid value*—the number of milligrams of potassium hydroxide (KOH) required to neutralize the alkali-reactive groups in 1 g of material under the conditions of test (see 6.4).

4. Significance and Use

4.1 This test method is used to determine the free acidity present in the nonvolatile portion of varnishes, oils, certain resins, and paint vehicles by the reaction with a standard alkali solution. Use of this test method provides a means whereby the

relative applicability of the varnish, oil, resin, or paint vehicle to the particular end use may be estimated by the buyer and the seller.

4.2 This test method also provides a convenient method of process control for the manufacture of certain resins and paint vehicles designed to meet particular requirements of the buyer and the seller.

5. Reagents and Solvents

5.1 *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, where such specifications are available.⁶ 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.

5.2 *Phenolphthalein Indicator Solution* (10 g/L)—Dissolve 1 g of phenolphthalein in 100 mL of methanol, ethanol, or isopropanol.

5.3 *Potassium Hydroxide, Methyl Alcohol (Methanol) Solution* (1 mL = 5.6 mg KOH)—Dissolve 6.6 g of potassium hydroxide (KOH) in 1 L of methyl alcohol. Standardize against National Institute of Standards and Technology standard potassium hydrogen phthalate Standard Reference No. 84, using phenolphthalein as the indicator (5.2). Do not adjust the concentration of the solution, but calculate the milligrams of KOH per litre of solution, *K*. (See Note.)

NOTE 1—At the discretion of the purchaser and the seller, an aqueous solution of potassium hydroxide of 0.1 *N* or 0.5 *N* may be used.

NOTE 2—Potassium hydroxide, methyl alcohol (methanol) solution may be purchased from most major laboratory chemical supplier houses. This material should be standardized as just indicated.

5.4 *Neutral Solvent Mixture*—Mix equal parts by volume of isopropyl alcohol (isopropanol) (see Specification D 770) and industrial toluene (see Specification D 362). Neutralize the

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² Discontinued; See 1989 Annual Book of ASTM Standards, Vol 06.03.

³ Annual Book of ASTM Standards, Vol 06.04.

⁴ Annual Book of ASTM Standards, Vol 06.01.

⁵ Annual Book of ASTM Standards, Vol 06.03.

⁶ *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 Pharmacopoeia and National Formulary*, U.S. Pharmacopoeial Convention, Inc. (USPC), Rockville, MD.