



Standard Test Method for pH of Engine Coolants and Antirusts¹

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

1. Scope

1.1 This test method covers the determination of the pH of unused engine coolants and antirusts, and used or unused aqueous dilutions of the concentrated products.

NOTE 1—Antirusts in solid form are not included in this test method.

NOTE 2—It is believed that this procedure gives all the information required for determining the pH of samples of engine coolant or antirust likely to be encountered. Should additional information on pH determinations be needed, reference should be made to Test Method E 70.

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.*

2. Referenced Documents

2.1 ASTM Standards:

D 1176 Practice for Sampling and Preparing Aqueous Solutions of Engine Coolants or Antirusts for Testing Purposes²

E 70 Test Method for pH of Aqueous Solutions with the Glass Electrode²

3. Summary of Test Method

3.1 A sample, as received or after dilution with a specified volume of distilled water, is placed in a beaker or sample cup and the pH measured with a pH meter and associated glass-saturated calomel electrode pair.

NOTE 3—The readings of the meter in the case of the concentrated products are not pH values according to the accepted definition, but are apparent pH values which are useful in the interpretation of the condition of the product.

4. Significance and Use

4.1 pH is a measure of the hydrogen ion concentration and indicates whether an engine coolant, antirust, or a solution of these compounds is acidic, alkaline, or neutral.

4.2 pH is sometimes used for production quality control. It is generally desirable that engine coolants have an alkaline pH.

4.3 pH is not significant from the standpoint of predicting service life. The pH of used engine coolants or antirust solutions is not a dependable indication of either existing effectiveness or remaining life of the solution.

5. Apparatus

5.1 The pH meter, glass electrode, and calomel electrode, shall be as specified in the Annex.

6. 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, where such specifications are available.³ 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 distilled water or water of equal purity. Distilled water shall be boiled thoroughly, or purged with carbon dioxide-free air, to remove carbon dioxide and shall be protected with a soda-lime tube or its equivalent while cooling and in storage. The pH of the water shall be between 6.2 and 7.2 at 25°C.

6.3 *Standard Buffer Solutions*—The buffer solutions for calibrating the pH meter and electrode pair shall be prepared from salts sold specifically for use, either singly or in combination, as pH standards. The salts shall be dried for 1 h at 110°C before use, except in the case of borax which shall be used as the decahydrate. The solutions with pH less than 9.5 shall be stored in chemically resistant bottles. The alkaline phosphate solution shall be stored in glass bottles coated on the side with paraffin.

¹ This test method is under the jurisdiction of ASTM Committee D15 on Engine Coolants and is the direct responsibility of Subcommittee D15.04 on Chemical Properties.

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² *Annual Book of ASTM Standards*, Vol 15.05.

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. Pharmaceutical Convention, Inc. (USPC), Rockville, MD.