



Standard Test Methods for Resistance of Glass Containers to Chemical Attack¹

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

1. Scope

1.1 These test methods cover the evaluation of the resistance of glass containers to chemical attack. Three test methods are presented, as follows:

1.1.1 *Test Method B-A* covers autoclave tests at 121°C on bottles partially filled with dilute acid as the attacking medium.

1.1.2 *Test Method B-W* covers autoclave tests at 121°C on bottles partially filled with distilled water as the attacking medium.

1.1.3 *Test Method P-W* covers autoclave tests at 121°C on powdered samples with pure water as the attacking medium.

1.2 The values stated in SI units are to be regarded as the standard. The values in parentheses are for information only.

1.3 *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:

A 569/A 569M Specification for Steel, Carbon (0.15 Maximum Percent), Hot-Rolled Sheet and Strip Commercial Quality²

D 1125 Test Methods for Electrical Conductivity and Resistivity of Water³

D 1193 Specification for Reagent Water³

E 11 Specification for Wire-Cloth Sieves for Testing Purposes⁴

E 691 Practice for Conducting an Interlaboratory Study to Determine the Precision of a Test Method⁴

3. Significance and Use

3.1 The solubility of glass in contact with food, beverages, or pharmaceutical products is an important consideration for the safe packaging and storage of such materials. Autoclave

conditions are specified since sterilization is often employed for the packaging of the product. It also represents one of the most extreme conditions, particularly of temperature, that containers will ordinarily experience. Any of the three test methods described may be used to establish specifications for conformity to standard values, either as specified by a customer, an agency, or “The United States Pharmacopeia:”

3.1.1 *Test Method B-A* is intended particularly for testing glass containers primarily destined for containment of products with a pH under 5.

3.1.2 *Test Method B-W* is intended particularly for testing glass containers to be used for products with a pH of 5.0 or over.

3.1.3 *Test Method P-W* is a hydrolytic autoclave test primarily intended for evaluating samples from untreated glass containers. It is often useful for testing the resistance of containers of too small capacity to permit measurements of solubility on the unbroken article by the B-W test method. Yielding the water resistance of the bulk glass, it can also be used in conjunction with the B-W test method to distinguish whether the internal surface of a container has been treated to improve its durability.

3.2 All three test methods are suitable for specification acceptance.

4. Purity of Reagents

4.1 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.⁵ 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.

4.2 Unless otherwise indicated, references to water shall be understood to mean distilled water or other water meeting the requirements for one of the types of reagent water covered by Specification D 1193.

¹ These test methods are under the jurisdiction of ASTM Committee C-14 on Glass and Glass Products and are the direct responsibility of Subcommittee C14.03 on Chemical Properties.

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² *Annual Book of ASTM Standards*, Vol 01.03.

³ *Annual Book of ASTM Standards*, Vol 11.01.

⁴ *Annual Book of ASTM Standards*, Vol 14.02.

⁵ *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.

