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Standard Specification for Annealed Soda-Lime-Silicate Glass Containers That Are Produced for Use as Candle Containers[1]

This standard is issued under the fixed designation F2179; 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 This specification covers the minimum requirements for annealed soda-lime-silicate glass containers when the producer knows the containers are to be used as candle containers.

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 requirements prior to use.*

2. Referenced Documents

2.1 Reference to these documents shall be the latest revision, unless otherwise specified by the authority applying this specification.

2.2 *ASTM Standards:*[2]

C148 Test Methods for Polariscopic Examination of Glass Containers

C149 Test Method for Thermal Shock Resistance of Glass Containers

C162 Terminology of Glass and Glass Products

C224 Practice for Sampling Glass Containers

F1972 Guide for Terminology Relating to Candles and Associated Accessory Items

3. Terminology

3.1 For definitions of glass and glass products terms used in this specification, refer to Terminology C162.

3.2 For definitions of candle related terms used in this specification, refer to Guide F1972.

4. Performance Requirements

4.1 *Annealing:*

4.1.1 *Transparent Glass*—Containers examined under polarized light in accordance with Test Methods C148 shall, after annealing, show no greater than real temper number 4. This performance requirement will also apply to containers that are further processed (such as ceramic enamel decorations), following the original manufacture, by reheating the container above the strain point and cooling to room temperature. The Scratch Test (Section 5) can be used as an alternative to Test Methods C148. Containers tested in accordance with the Scratch Test shall show no fractures.

4.1.2 *Non-transparent Glass*—If glass condition (color, decoration, etc.) prohibits sufficient light transmission for use of Test Methods C148, annealing shall be qualified through the use of the Scratch Test (Section 5). Containers tested in accordance with the Scratch Test shall show no fractures. This performance requirement will also apply to containers that are further processed (such as ceramic enamel decorations), following the original manufacture, by re-heating the container above the strain point and cooling to room temperature.

4.2 *Thermal Shock:*

4.2.1 Containers shall not crack or break when tested, with the water retained in the container from the first immersion through the second immersion, at a thermal shock temperature differential (ΔT) of 50°C (90°F) during continuous production in accordance with Test Method C149.

4.2.2 Containers shall be tested at a thermal shock temperature differential (ΔT) of 50°C (90°F) during lot sampling in accordance with Practice C224.

5. Test Methods

5.1 *Scope*—This Scratch Test Method is designed to ensure that residual stress is reduced to a commercially acceptable level in annealed soda-lime-silicate glass containers that are intended for use as candle containers. It provides an alternative method to Test Methods C148. Two methods of performing the Scratch Test are covered:

5.1.1 *Test Method A*—Scratch Test using a tungsten carbide scribe, 5.4.2.1, and

5.1.2 *Test Method B*—Scratch Test using fifty-grit emery paper/cloth, 5.4.2.2.

NOTE 1—Independent test results showed no significant statistical difference between using tungsten carbide scribe and fifty-grit emery paper/cloth.

[1] This specification is under the jurisdiction of ASTM Committee F15 on Consumer Products and is the direct responsibility of Subcommittee F15.45 on Candle Products.

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[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.

5.2 *Significance and Use*—This test method can be used in the quality control of soda-lime-silicate glass candle containers, where the degree of annealing must be verified to ensure quality products. This procedure can be used where glass cannot be read by polariscope (color, decoration, etc.) or as an alternative method for transparent glass containers.

5.3 *Sampling*—Methods of sampling for a group of containers of a given type are given in Practice C224 for annealing.

5.4 *Test Procedure:*

5.4.1 Allow the ware to cool evenly through the entire thickness of the container to room temperature before using either Method A or B.

NOTE 2—Failure to cool the container completely may result in a false result.

5.4.2 *Scratch Procedure:*

5.4.2.1 *Using Method A*—With a tungsten carbide scribe, scratch once around the inside knuckle of the article. Then scratch an "X" across the entire inside bottom surface of the article. All scratches are to be made using sufficient pressure to penetrate the surface of the glass.

5.4.2.2 *Using Method B*—With fifty-grit emery paper/cloth, abrade the inside surface of each article using sufficient force to penetrate the surface of the glass. Ensure that all sharp corners, dimples, indentations are abraded. A new piece of emery paper/cloth is to be used for every piece tested.

5.4.3 After using either method A or B, fill each article with water at the same room temperature as the glass. Wait fifteen minutes, then empty the water and examine each piece for fractures.

5.5 *Report*—Report the number of fractures, if any for each test.

5.6 *Precision and Bias*—No information is presented about either the precision or bias of the scratch test method since the test result (fracture versus no fracture) is nonquantitative.

6. Keywords

6.1 annealing; attributes; candle containers; glass; non transparent glass; scratch test; soda-lime-silicate; thermal shock; transparent glass