Designation: C484 – 20

Standard Test Method for Thermal Shock Resistance of Glazed Ceramic Tile[1]

This standard is issued under the fixed designation C484; 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 test method covers the determination of the resistance to thermal shock of glazed ceramic tiles under normal conditions of use.

1.2 The values stated in SI units are to be regarded as the standard. The values given 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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.4 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

C242 Terminology of Ceramic Whitewares and Related Products

3. Terminology

3.1 *Definitions:*

3.1.1 For the definitions of terms used on this test method, refer to Terminology C242.

4. Summary of Test Method

4.1 This test method consists of determining the thermal shock resistance of ceramic tiles by cycling a sample ten times between the temperatures of 15 ± 5 °C (59 ± 9 °F) and 145 ± 5 °C (293 ± 9 °F). This test method includes two procedures, with and without immersion, for tiles with a water absorption less than or equal to 10 % and tiles with a water absorption greater than 10 %, respectively. After completing ten cycles, the tiles are inspected for any damage as a result of the cycling.

5. Significance and Use

5.1 This test method is intended for testing glazed ceramic tile that are to be used in areas in which they may be subjected to rapid or severe temperature changes.

6. Apparatus

6.1 *Water Bath,* for testing with immersion, through which 15 ± 5 °C (59 ± 9 °F) water flows at a rate of 1 gal/min. The bath shall hold at least 5 gal (19 L) of water and shall be of dimensions such that the test sample is immersed completely when placed in the bath vertically.

6.2 *Covered Water Bath,* for testing without immersion, consisting of the Water Bath in 6.1 covered with an aluminum sheet and layer of aluminum grains. The aluminum sheet shall be 5.18 mm (0.204-in.) thick—No. 4 B&S—gauge and of dimensions such that the test sample can be placed glazed face down on it. The aluminum sheet shall cover the mouth of the bath with the flow of water directed such that it is in contact with bottom surface of the aluminum sheet. The entire top surface of the aluminum sheet shall be covered with a 3 mm (0.197-in.) thick layer of aluminum grains. The diameters of the aluminum grains shall be in the range of 0.3 to 0.6 mm (0.012 to 0.024 in.).

6.3 *Oven,* capable of maintaining a constant temperature of 145 ± 5 °C (293 ± 9 °F).

7. Sampling

7.1 *Number of Test Specimens*—The test sample shall consist of at least five tiles or trim units, selected at random from the lot to be tested.

7.2 *Size of Test Specimens*—Test specimens up to 30 × 30 cm (12 × 12 in.) shall remain uncut for testing. Specimens with edges greater than 30 cm (12 in.) may be reduced in size to no smaller than 30 cm (12 in.).

8. Procedure

8.1 Before testing for resistance to thermal shock, inspect the tiles for visible defects. To assist in detecting defects, a

[1] This test method is under the jurisdiction of ASTM Committee C21 on Ceramic Whitewares and Related Productsand is the direct responsibility of Subcommittee C21.06 on Ceramic Tile.

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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.