



Ceramic tiles

Method 9: Determination of resistance to thermal shock



AS ISO 10545.9:2020

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- Association of Consultants in Access Australia
- Australian Ceramic Society
- Australian Industry Group
- Australian Institute of Waterproofing
- Australian Stone Advisory Association
- Australian Tile Council
- CSIRO
- Master Builders Australia
- Surface Coatings Association Australia
- Swimming Pool and Spa Association of Australia
- TAFE NSW
- Tiles and Tiling Industry Association Australia

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Method 9: Determination of resistance to thermal shock

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Preface

This Test Method was prepared by the Standards Australia Committee BD-044, Fixing of Ceramic, Natural and Reconstituted Stone Tiles to supersede AS 4459.9—1997, *Methods of sampling and testing ceramic tiles — Part 9: Determination of resistance to thermal shock*.

The objective of this Test Method is to specify a test method for determining the resistance to thermal shock of all ceramic tiles under normal conditions of use.

This Test Method is identical with, and has been reproduced from, ISO 10545-9:2014, *Ceramic tiles — Part 9: Determination of resistance to thermal shock*.

As this document has been reproduced from an International Standard, the following applies:

- (a) In the source text “this part of ISO 10545” should read “this Australian Standard”.
- (b) A full point substitutes for a comma when referring to a decimal marker.

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The terms “normative” and “informative” are used in Standards to define the application of the appendices or annexes to which they apply. A “normative” appendix or annex is an integral part of a Standard, whereas an “informative” appendix or annex is only for information and guidance.

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2. www.iso.org/directives

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received. www.iso.org/patents

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

The committee responsible for this document is ISO/TC 189, *Ceramic tiles*.

This third edition cancels and replaces the second edition (ISO 10545-9:2004), which has been technically revised.

ISO 10545 consists of the following parts, under the general title *Ceramic tiles*:

- *Part 1: Sampling and basis for acceptance*
- *Part 2: Determination of dimensions and surface quality*
- *Part 3: Determination of water absorption, apparent porosity, apparent relative density and bulk density*
- *Part 4: Determination of modulus of rupture and breaking strength*
- *Part 5: Determination of impact resistance by measurement of coefficient of restitution*
- *Part 6: Determination of resistance to deep abrasion for unglazed tiles*
- *Part 7: Determination of resistance to surface abrasion for glazed tiles*
- *Part 8: Determination of linear thermal expansion*
- *Part 9: Determination of resistance to thermal shock*
- *Part 10: Determination of moisture expansion*
- *Part 11: Determination of crazing resistance for glazed tiles*
- *Part 12: Determination of frost resistance*
- *Part 13: Determination of chemical resistance*
- *Part 14: Determination of resistance to stains*
- *Part 15: Determination of lead and cadmium given off by glazed tiles*
- *Part 16: Determination of small colour differences*

1 Scope

This part of ISO 10545 specifies a test method for determining the resistance to thermal shock of all ceramic tiles under normal conditions of use.

Depending on the water absorption of the tiles, different procedures (tests with or without immersion) are used unless there is an agreement to the contrary.

NOTE ISO 13006 provides property requirements for tiles and other useful information on these products.

2 Normative References

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 10545-3, *Ceramic tiles — Part 3: Determination of water absorption, apparent porosity, apparent relative density and bulk density*

3 Principle

Determination of the resistance to thermal shock of a wall tile by cycling 10 times between the temperatures of 15 °C and 145 °C.

4 Apparatus

4.1 Low-temperature water bath, through which cold water flows at (15 ± 5) °C.

One example is a bath 55 cm long, 35 cm wide and 20 cm deep, with a water flowrate of 4 l/min. Any other suitable apparatus may be used.

For the case of testing with immersion, applicable to all tiles having a water absorption coefficient less than or equal to a mass fraction of 10 % (determined in accordance with ISO 10545-3), the bath shall not be covered and shall be of sufficient depth to allow the tiles to be placed vertically and immersed completely.

For the case of testing without immersion, applicable to glazed tiles having a water absorption coefficient greater than a mass fraction of 10 % (determined in accordance with ISO 10545-3), the bath shall be covered with a thick aluminium plate in such a manner that the water, directed towards the surface, is in contact with the plate. The aluminium plate shall be covered with a layer approximately thick of 5 mm aluminium granules with diameters in the range of 0,3 mm to 0,6 mm.

4.2 Oven, capable of being operated at 145 °C to 150 °C.