



**NSAI**  
Standards

Irish Standard  
I.S. EN ISO 10545-9:2013

# Ceramic tiles - Part 9: Determination of resistance to thermal shock (ISO 10545-9:2013)

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## I.S. EN ISO 10545-9:2013

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## Ceramic tiles - Part 9: Determination of resistance to thermal shock (ISO 10545-9:2013)

Carreaux et dalles céramiques - Partie 9: Détermination de la résistance aux chocs thermiques (ISO 10545-9:2013)

Keramische Fliesen und Platten - Teil 9: Bestimmung der Temperaturwechselbeständigkeit (ISO 10545-9:2013)

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## **Foreword**

This document (EN ISO 10545-9:2013) has been prepared by Technical Committee ISO/TC 189 “Ceramic tile” in collaboration with Technical Committee CEN/TC 67 “Ceramic tiles” the secretariat of which is held by UNI.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by January 2014, and conflicting national standards shall be withdrawn at the latest by January 2014.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

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**Ceramic tiles —**

**Part 9:**  
**Determination of resistance to**  
**thermal shock**

*Carreaux et dalles céramiques —*

*Partie 9: Détermination de la résistance aux chocs thermiques*



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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](http://www.iso.org/directives)

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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 tile*.

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*

# Ceramic tiles —

## Part 9:

## Determination of resistance to thermal shock

### 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 whole 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 $(15 \pm 5)$ °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.

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