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Standards

Irish Standard  
I.S. EN ISO 10545-4:2019

# Ceramic tiles - Part 4: Determination of modulus of rupture and breaking strength (ISO 10545-4:2019)

**I.S. EN ISO 10545-4:2019**

*Incorporating amendments/corrigenda/National Annexes issued since publication:*

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NSAI  
1 Swift Square,  
Northwood, Santry  
Dublin 9

T +353 1 807 3800  
F +353 1 807 3838  
E standards@nsai.ie  
W NSAI.ie

Sales:  
T +353 1 857 6730  
F +353 1 857 6729  
W standards.ie

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## National Foreword

I.S. EN ISO 10545-4:2019 is the adopted Irish version of the European Document EN ISO 10545-4:2019, Ceramic tiles - Part 4: Determination of modulus of rupture and breaking strength (ISO 10545-4:2019)

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EUROPEAN STANDARD

**EN ISO 10545-4**

NORME EUROPÉENNE

EUROPÄISCHE NORM

March 2019

ICS 91.100.23

Supersedes EN ISO 10545-4:2014

English Version

## Ceramic tiles - Part 4: Determination of modulus of rupture and breaking strength (ISO 10545-4:2019)

Carreaux et dalles céramiques - Partie 4:  
Détermination de la résistance à la flexion et de la force  
de rupture (ISO 10545-4:2019)

Keramische Fliesen und Platten - Teil 4: Bestimmung  
der Biegefestigkeit und der Bruchlast (ISO 10545-  
4:2019)

This European Standard was approved by CEN on 15 February 2019.

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This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

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**CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels**

**EN ISO 10545-4:2019 (E)**

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## **European foreword**

This document (EN ISO 10545-4:2019) 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of an identical text or by endorsement, at the latest by September 2019, and conflicting national standards shall be withdrawn at the latest by September 2019.

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

This document supersedes EN ISO 10545-4:2014.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

## **Endorsement notice**

The text of ISO 10545-4:2019 has been approved by CEN as EN ISO 10545-4:2019 without any modification.

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# INTERNATIONAL STANDARD

# ISO 10545-4

Fourth edition  
2019-02

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## Ceramic tiles —

Part 4:

### Determination of modulus of rupture and breaking strength

*Carreaux et dalles céramiques —*

*Partie 4: Détermination de la résistance à la flexion et de la force  
de rupture*



Reference number  
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ISO copyright office  
CP 401 • Ch. de Blandonnet 8  
CH-1214 Vernier, Geneva  
Phone: +41 22 749 01 11  
Fax: +41 22 749 09 47  
Email: [copyright@iso.org](mailto:copyright@iso.org)  
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## ISO 10545-4:2019(E)

### 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 (see [www.iso.org/directives](http://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 (see [www.iso.org/patents](http://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.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see [www.iso.org/iso/foreword.html](http://www.iso.org/iso/foreword.html).

This document was prepared by Technical Committee ISO/TC 189, *Ceramic tile*.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at [www.iso.org/members.html](http://www.iso.org/members.html).

This fourth edition cancels and replaces the third edition (ISO 10545-4:2014), which has been technically revised. The main changes compared to the previous edition are as follows:

- test specimens are tested in different format size according to their work size thickness that can be minor or greater/equal than 7,5 mm;
- the minimum number of specimen to be tested has been changed.

A list of all parts in the ISO 10545 series can be found on the ISO website.

# Ceramic tiles —

## Part 4: Determination of modulus of rupture and breaking strength

### 1 Scope

This document specifies a test method for determining the modulus of rupture and breaking strength of all ceramic tiles.

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

### 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 48-2, *Rubber, vulcanized or thermoplastic — Determination of hardness — Part 2: Hardness between 10 IRHD and 100 IRHD*

### 3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at <https://www.iso.org/obp>

— IEC Electropedia: available at <http://www.electropedia.org/>

#### 3.1 breaking load

*F*

force necessary to cause the test specimen to break, as read from the pressure gauge (see [Figure 1](#))

#### 3.2 breaking strength

*S*

force obtained by multiplying the *breaking load* ([3.1](#)) by the ratio (span between support rods)/(width of the test specimen)

#### 3.3 modulus of rupture

*R*

quantity obtained by dividing the calculated *breaking strength* ([3.2](#)) by the square of the minimum thickness along the broken edge

#### 3.4 work size thickness

thickness of the tile specified by the manufacturer

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