
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



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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 (see www.iso.org/directives).

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is ISO/TC 189, *Ceramic Tiles*, Subcommittee SC . .

This third edition cancels and replaces the second edition (ISO 10545-4:2004), 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*

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Ceramic tiles —

Part 4:

Determination of modulus of rupture and breaking strength

1 Scope

This part of ISO 10545 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, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 48:2010, *Rubber, vulcanized or thermoplastic — Determination of hardness (hardness between 10 IRHD and 100 IRHD)*

ISO 13006, *Ceramic tiles — Definitions, classification, characteristics and marking*

3 Terms and definitions

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

3.1 breaking load

F

force necessary to cause the test specimen to break, as read from the pressure gauge

Note 1 to entry: See [7.5](#) and [Figure 1](#).

Note 2 to entry: The breaking load is expressed in newtons.

3.2 breaking strength

S

force obtained by multiplying the breaking load by the ratio (span between support rods)/(width of the test specimen)

Note 1 to entry: See Formula (1) in [Clause 8](#).

Note 2 to entry: The breaking strength is expressed in newtons

3.3 modulus of rupture

R

quantity obtained by dividing the calculated breaking strength by the square of the minimum thickness along the broken edge

Note 1 to entry: See Formula (2) in [Clause 8](#).