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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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Foreword

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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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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.

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.

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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/

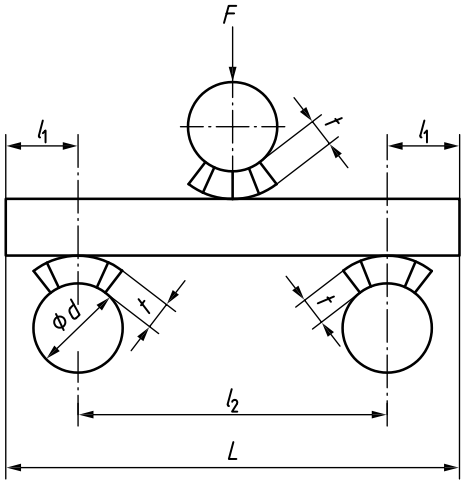
3.1
breaking load
F
force necessary to cause the test specimen to break, as read from the pressure gauge (see Figure 1)

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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Key

d diameter of rod
L long side of tile
l_1 overlap of tile beyond the edge supports
l_2 span between the support rods
t thickness of rubber

Figure 1 — Application of load to test specimens

4 Principle

Determination of the breaking load, breaking strength, and modulus of rupture of a tile by applying a force at a specified rate to the centre of the tile, the point of application being in contact with the proper surface of the tile.

5 Apparatus

5.1 Drying oven, capable of being operated at (105 ± 5) °C.

Microwave, infrared or other drying systems can be used provided that it has been determined that equal results are obtained.

5.2 Recording pressure gauge, accurate to 2,0 %.

5.3 Two cylindrical support rods, made of metal, the parts in contact with the test specimens being covered with rubber having a hardness of (50 ± 5) IRHD, measured in accordance with ISO 48-2.

One rod shall be slightly pivotable (see Figure 2) and the other shall be slightly rotatable about its own axis. See Table 1 for relevant dimensions.

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