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Ceramic tiles — Grouts and adhesives —

Part 1: Terms, definitions and specifications for adhesives

Carreaux céramiques — Mortiers de joints et colles —
Partie 1: Termes, définitions et spécifications relatives aux colles

Reference number
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ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

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Contents

Page

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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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.

ISO 13007-1 was prepared by Technical Committee ISO/TC 189, *Ceramic tile*.

ISO 13007 consists of the following parts, under the general title *Ceramic tiles — Grouts and adhesives*:

— *Part 1: Terms, definitions and specifications for adhesives*

— *Part 2: Test methods for adhesives*

— *Part 3: Terms, definitions and specifications for grouts*

— *Part 4: Test methods for grouts*

Ceramic tiles — Grouts and adhesives —

Part 1:
Terms, definitions and specifications for adhesives

1 Scope

This part of ISO 13007 is applicable to ceramic tile adhesives for internal and external tile installations on walls and floors.

This part of ISO 13007 establishes the terminology, concerning the products, working methods, application properties, etc., for ceramic tile adhesives.

This part of ISO 13007 specifies the values of performance requirements for all ceramic tile adhesives [cementitious (C), dispersion (D) and reaction resin (R) adhesives].

This part of ISO 13007 does not contain criteria or recommendations for the design and installation of ceramic tiles.

NOTE Ceramic tile adhesives can also be used for other types of tiles (natural and agglomerated stones, etc.), where these do not adversely affect the materials.

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 13007-2:—[1)], *Ceramic tiles — Grouts and adhesives — Part 2: Test methods for adhesives*

3 Terms and definitions

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

3.1
substrate
fixing surface
surface upon which the tile is installed (fixed)

3.2
wall and floor tiles
tiles made out of ceramic or natural and agglomerated stones

NOTE See ISO 13006 for the definition of ceramic tiles.

1) To be published.

3.3
cementitious adhesive
C
mixture of hydraulic binding agents, aggregates, and organic additives, to be mixed with water or liquid admix just before use

3.4
dispersion adhesive
D
ready-for-use mixture of organic binding agent(s) that is in the form of an aqueous polymer dispersion, organic additives and mineral fillers

3.5
reaction resin adhesive
R
single or multi-component mixture of synthetic resin, mineral fillers and organic additives in which curing occurs by chemical reaction

3.6
notched trowel
toothed tool, which makes it possible to apply the adhesive as a series of ribs of a uniform thickness onto the fixing surface and/or the reverse face of the tile

3.7
application to one surface only
adhesive applied only to the fixing surface with a trowel to obtain a uniform layer and then combed with a notched trowel

3.8
application to both surfaces
adhesive applied to the fixing surface and to the reverse surface of the tiles

3.9
shelf life
time of storage under stated conditions during which an adhesive can be expected to maintain its working properties

3.10
maturing time
interval between the time when the cementitious adhesive is mixed and the time when it is ready for use

3.11
pot-life
time interval during which the adhesive can be used after mixing

3.12
open time
maximum time interval after application at which tiles can be embedded in the applied adhesive and meet the specified tensile adhesion strength requirement

3.13
slip
downward movement of a tile applied to a combed adhesive layer on a vertical surface

3.14
adjustability
maximum time interval after which the tile's position in the adhesive layer can be adjusted without significant loss of adhesion strength

3.15
adhesion strength
maximum strength per unit surface area which can be measured by shear or tensile testing

3.16
deformability
capacity of a hardened adhesive to be deformed by stresses between the tile and the fixing surface without damage to the installed surface

3.17
transverse deformation
deflection recorded at the centre when a beam of hardened adhesive is subjected to three-point loading

3.18
fundamental characteristic
characteristic that an adhesive is absolutely required to have

3.19
additional characteristic
characteristic for specific service condition(s) where enhanced levels of performance are required

3.20
special characteristic
characteristic of the adhesive which provides further information about its general performance

4 Classification and designation

Tile adhesives are classified as follows:

a) into three **types** with the following **letter designation**:

   1) cementitious adhesive (3.3) **C**

   2) dispersion adhesive (3.4) **D**

   3) reaction resin adhesive (3.5) **R**

b) each type can be divided into

   1) two **classes** with the following **number designation**:

      i) normal adhesive **1**

      ii) improved adhesive **2**

   2) with the following different **optional characteristics** with the following **letter designation**:

      i) fast-setting/drying adhesive **F**

      ii) slip-resistant adhesive **T**

      iii) adhesive with extended open time **E**

      iv) special deformable characteristic for cementitious adhesives only **S**

For each type of adhesive, it is possible to have different classes, related to the different optional characteristics. The designation of the adhesive consists of the letter of the type (C,D or R), followed by the

number of the class (1 or 2) and/or the letter(s) corresponding to the characteristics (F, T, E, and/or S) to which it belongs. Table 1 gives the designation of current tile adhesives.

Table 1 — Designation and classification

Type	Class	Characteristic	Description
C	1		Normal cementitious adhesive
C	1	F	Fast-setting cementitious adhesive
C	1	T	Normal cementitious adhesive with slip resistance
C	1	FT	Fast-setting cementitious adhesive with slip resistance
C	2		Cementitious adhesive with improved characteristics
C	2	E	Cementitious adhesive with improved characteristics and extended open time
C	2	F	Fast-setting cementitious adhesive with improved characteristics
C	2	T	Cementitious adhesive with improved characteristics and slip resistance
C	2	TE	Cementitious adhesive with improved characteristics, slip resistance and extended open time
C	2	FT	Fast-setting cementitious adhesive with improved characteristics and slip resistance
D	1		Normal dispersion adhesive
D	1	T	Normal dispersion adhesive with slip resistance
D	2		Dispersion adhesive with improved characteristics
D	2	F	Fast-drying dispersion adhesive with improved characteristics
D	2	T	Dispersion adhesive with improved characteristics with slip resistance
D	2	TE	Dispersion adhesive with improved characteristics, slip resistance and extended open time
R	1		Normal reaction resin adhesive
R	1	T	Normal reaction resin adhesive with slip resistance
R	2		Reaction resin adhesive with improved characteristics
R	2	T	Reaction resin adhesive with improved characteristics and slip resistance
Note Additional designations can be inserted according to the combination of the different symbols of the characteristics. For example, C2ES1 deformable improved cementitious adhesive with improved and extended open time.			

5 Requirements

5.1 Substrates

The standard concrete substrate is mandatory. Other substrates may be used upon agreement if the substrate is recommended for the ceramic tile application by the adhesive manufacturer. To demonstrate compatibility with other optional substrates, the adhesive shall be applied to the selected substrate in accordance with the open-time test method (ISO 13007-2:—, 4.1). When the result of $\geqslant$ 0,5 N/mm^2 is achieved or cohesive failure occurs in the substrate, the requirement is considered satisfied.

5.2 Specifications for cementitious adhesives (C)

The normal-setting cementitious adhesives and fast-setting cementitious adhesives shall comply with the fundamental characteristics specified in Table 2.

Table 3 specifies the optional characteristics that can be required for special service conditions.

The transverse deformation is determined to 0,1 mm, by calculating the average value of the deformation obtained in the test.

The cementitious adhesives are categorized into two classes according to the measured transverse deformation value and are designated as follows:

a) **S1** deformable adhesives, with a transverse deformation $\geqslant$ 2,5 mm but $<$ 5 mm

b) **S2** highly deformable adhesives, with a transverse deformation $\geqslant$ 5 mm

The amount of water and/or liquid admix required for preparing the cementitious adhesive shall be the same for all tests.

Table 2 — Specifications for cementitious adhesives (C) — Fundamental characteristics

Cementitious adhesive	Characteristic	Requirement	Test method
Normal-setting adhesives C1	Tensile adhesion strength	$\geqslant$ 0,5 N/mm^2	ISO 13007-2:—, 4.4.4.2
	Tensile adhesion strength after water immersion	$\geqslant$ 0,5 N/mm^2	ISO 13007-2:—, 4.4.4.3
	Tensile adhesion strength after heat aging	$\geqslant$ 0,5 N/mm^2	ISO 13007-2:—, 4.4.4.4
	Tensile adhesion strength after freeze-thaw cycle	$\geqslant$ 0,5 N/mm^2	ISO 13007-2:—, 4.4.4.5
	Open time: tensile adhesion strength	$\geqslant$ 0,5 N/mm^2 after no less than 20 min	ISO 13007-2:—, 4.1
Fast-setting adhesives F	Tensile adhesion strength	$\geqslant$ 0,5 N/mm^2 after no more than 24 h	ISO 13007-2:—, 4.4.4.2
	Open time: tensile adhesion strength	$\geqslant$ 0,5 N/mm^2 after no less than 10 min	ISO 13007-2:—, 4.1
	Tensile adhesion strength after water immersion	$\geqslant$ 0,5 N/mm^2	ISO 13007-2:—, 4.4.4.3
	Tensile adhesion strength after heat aging	$\geqslant$ 0,5 N/mm^2	ISO 13007-2:—, 4.4.4.4
	Tensile adhesion strength after freeze-thaw cycle	$\geqslant$ 0,5 N/mm^2	ISO 13007-2:—, 4.4.4.5