



**SLOVENSKI STANDARD**  
**SIST EN 12004:2007+A1:2012**  
**01-september-2012**

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**Lepila in malte za ploščice - Zahteve, vrednotenje skladnosti, klasifikacija in označevanje**

Adhesives for tiles - Requirements, evaluation of conformity, classification and designation

Mörtel und Klebstoffe für Fliesen und Platten - Anforderungen, Konformitätsbewertung, Klassifizierung und Bezeichnung

Colles à carrelage - Exigences, évaluation de la conformité, classification et désignation

**Ta slovenski standard je istoveten z: EN 12004:2007+A1:2012**

**ICS:**

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91.100.10	Cement. Mavec. Apno. Malta	Cement. Gypsum. Lime. Mortar
91.100.23	Keramične ploščice	Ceramic tiles

**SIST EN 12004:2007+A1:2012**                      **en,fr,de**

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
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**EN 12004:2007+A1**

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## Adhesives for tiles - Requirements, evaluation of conformity, classification and designation

Colles à carrelage - Exigences, évaluation de la conformité,  
classification et désignation

Mörtel und Klebstoffe für Fliesen und Platten -  
Anforderungen, Konformitätsbewertung, Klassifizierung und  
Bezeichnung

This European Standard was approved by CEN on 4 February 2007 and includes Amendment 1 approved by CEN on 13 May 2012.

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## Contents

Page

Foreword.....	3
Introduction .....	4
1 Scope .....	5
2 Normative references .....	5
3 Terms and definitions .....	6
4 Requirements .....	9
4.1 Cementitious adhesives (C).....	9
4.2 Dispersion Adhesives (D) .....	9
4.3 Reaction resin adhesives (R).....	10
4.4 Reaction to fire.....	11
4.5 Release of dangerous substances.....	12
5 Evaluation of conformity.....	13
5.1 Principle.....	13
5.2 Conditioning of the test specimen.....	13
5.3 Initial type testing .....	13
5.4 Factory Production Control.....	14
5.5 Registration, traceability and non-conforming materials.....	17
5.6 <sup>A1</sup> Initial inspection of factory and of FPC.....	17
5.7 Continuous surveillance of FPC <sup>A1</sup> .....	18
6 Classification and designation.....	18
7 Marking and labelling .....	20
Annex A <sup>A1</sup> (normative) <sup>A1</sup> Failure patterns.....	21
Annex ZA (informative) Clauses of this European Standard addressing the provisions of the EU Construction Products Directive.....	22
Bibliography .....	31

## Foreword

This document (EN 12004:2007+A1:2012) has been prepared by 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 December 2012, and conflicting national standards shall be withdrawn at the latest by March 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.

This document includes Amendment 1, approved by CEN on 2012-05-13.

This document supersedes A1 EN 12004:2007 A1.

The start and finish of text introduced or altered by amendment is indicated in the text by tags A1 A1.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this document.

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, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

**EN 12004:2007+A1:2012 (E)****Introduction**

It is essential that the characteristics of the construction products defined in this standard consider that the normal stresses due to the works for which they are intended, assembled or installed, can be properly accommodated. Some special characteristics will take into account the type of substrate and that the adhesives should resist the degrading actions of climate, etc.

Many properties of adhesives for tiling are mainly determined by the type of binders used.

Different types of tile adhesives are defined according to the chemical nature of their binders.

The different types have specific characteristics in terms of their application properties and final performance.

The relationship between characteristics and the working conditions (dry or humid conditions, hot climate, fast setting, etc.) is not given in this standard.

The manufacturer should give information about the use of the product and the correct conditions of use.

The specifier should evaluate the state of the job site (mechanical and thermal influences) and choose the appropriate product considering all the possible risks.

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## 1 Scope

**A1** This European Standard is applicable to ceramic tile cementitious adhesives, dispersion adhesives and reaction resin adhesives for internal and external tile installations on walls and floors. **A1**

This standard gives the terminology concerning the products, working methods, application properties, etc, for ceramic tile adhesives.

This European Standard specifies the values of performance requirements for ceramic tile adhesives (cementitious, dispersion and reaction resin adhesives).

This European Standard does not provide criteria or recommendations for the design and installation of ceramic tiles.

NOTE Ceramic tile adhesives may also be used for other types of tiles (natural and agglomerated stones, etc.), if they do not adversely affect these 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.

EN 1308, *Adhesives for tiles — Determination of slip*

EN 1324:2007, *Adhesives for tiles — Determination of shear adhesion strength of dispersion adhesives*

EN 1346, *Adhesives for tiles — Determination of open time*

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EN 1347, *Adhesives for tiles — Determination of wetting capability*

EN 1348:2007, *Adhesives for tiles — Determination of tensile adhesion strength for cementitious adhesives*

EN 12002, *Adhesives for tiles — Determination of transverse deformation for cementitious adhesives and grouts*

**A1** EN 12003:2008 **A1**, *Adhesives for tiles — Determination of shear adhesion strength of reaction resin adhesives*

EN 12808-1, **A1** *Grouts for tiles — Part 1: Determination of chemical resistance of reaction resin mortars* **A1**

**A1** EN 13238, *Reaction to fire tests for building products — Conditioning procedures and general rules for selection of substrates* **A1**

EN 13501-1, *Fire classification of construction products and building elements — Part 1: Classification using data from reaction to fire tests*

**A1** EN 13823, *Reaction to fire tests for building products — Building products excluding floorings exposed to the thermal attack by a single burning item*

EN 14411, *Ceramic tiles — Definitions, classification, characteristics and marking*

EN ISO 11925-2, *Reaction to fire tests — Ignitability of products subjected to direct impingement of flame — Part 2: Single-flame source test (ISO 11925-2)* **A1**

**EN 12004:2007+A1:2012 (E)****3 Terms and definitions**

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

**3.1 General****3.1.1****thin bed method**

method used for installing tiles onto a plane surface with an adhesive

NOTE The adhesive is usually applied with a trowel to obtain a layer and then combed with a notched trowel to achieve the right thickness and planarity

**3.1.2****fixing surface**

plane rigid surface upon which the tile is fixed

**3.1.3****wall and floor tiles**

tiles made out of ceramic or natural and agglomerated stones

**3.2 Products****3.2.1****cementitious adhesive**

mixture of hydraulic binding agents, aggregates, and organic additives

NOTE 1 The adhesives are mixed with water or liquid admix just before use.

NOTE 2 Cementitious adhesives are designated as type C.

**3.2.2****dispersion adhesive**

mixture of organic binding agent(s) in the form of an aqueous polymer dispersion, organic additives and mineral fillers

NOTE 1 The mixture is ready for use

NOTE 2 Dispersion adhesives are designated as type D.

**3.2.3****reaction resin adhesive**

mixture of synthetic resin, mineral fillers and organic additives in which hardening occurs by chemical reaction

NOTE 1 They are available in one or more component forms

NOTE 2 reaction resin adhesive are designated as type R

**3.3 Tools and working methods****3.3.1****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



**3.3.2****application to one surface only, Notched trowel or Floating method**

adhesive applied only to the fixing surface, usually with a trowel to obtain a uniform layer and then combed with a notched trowel

NOTE The tiles are then fixed before a film forms on the surface of the adhesive

**3.3.3****application to both surfaces, Floating and buttering method**

adhesive applied to the fixing surface and to the reverse of the tiles

NOTE The combined layer of adhesive should not exceed the maximum recommended thickness. The tiles are then fixed before a film forms on the surface of the adhesive

**3.4 Application properties****3.4.1****shelf life**

time of storage under stated conditions during which an adhesive is expected to maintain its working properties

**3.4.2****maturing time**

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

**3.4.3****pot-life**

maximum time interval during which the adhesive can be used after mixing

**3.4.4****open time**

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

NOTE Open time is measured by the method described in EN 1346

**3.4.5****wetting capability**

ability of a combed adhesive layer to wet the tile

NOTE Wetting capability is measured by the method described in EN 1347

**3.4.6****slip**

downward movement of a tile applied to a combed adhesive layer on a vertical or inclined surface

NOTE Slip is measured by the method described in EN 1308

**3.4.7****adjustability**

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

**3.5 Final properties****3.5.1****adhesion strength**

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

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**EN 12004:2007+A1:2012 (E)**

NOTE Adhesion strength is measured by the methods described in EN 1348, EN 1324 or EN 12003 depending on the type of adhesive

**3.5.2****deformability**

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

**3.5.3****transverse deformation**

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

NOTE Transverse deformation is used to evaluate the deformability of the adhesive. It is measured by the method described in EN 12002.

**3.6 Failure pattern****3.6.1****adhesion failure (AF-S or AF-T)**

when failure occurs at the interface between adhesive and substrate the notation AF-S is used, when it occurs between tile and adhesive the notation AF-T is used and in both cases the test values equal the adhesion strength (see Figure A.1 and Figure A.2)

NOTE In some cases failure can occur in the adhesive layer between the tile and the pull-head plate. In this case the notation BT is used, see Figure A.3, and the adhesion strength is greater than the test value. The test should be preferably repeated

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**3.6.2****cohesive failure within the adhesive (CF-A)**

when failure occurs within the adhesive layer (see Figure A.4)

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**3.6.3****cohesive failure in the substrate or in the tile (CF-S or CF-T)**

when failure occurs within the substrate the notation CF-S is used, see Figure A.5; when it happens within the body of the tile the notation CF-T is used (see Figure A.6)

NOTE In this case the strength of the adhesive is greater than the test value

**3.7 Characteristics****3.7.1****fundamental characteristics**

characteristics that an adhesive absolutely has to have

**3.7.2 Optional characteristics****3.7.2.1****additional characteristics**

characteristics for specific service conditions where enhanced levels of performance are required

**3.7.2.2****special characteristics**

characteristics of the adhesive which provide further information about its general performance

## 4 Requirements

### 4.1 Cementitious adhesives (C)

Normal setting cementitious adhesives shall comply with the characteristics specified in Table 1a, while fast setting cementitious adhesives shall comply with Table 1b.

Tables 1c and 1d give the optional characteristics that can be required for special service conditions.

For the characteristic of wetting capability (measured in accordance with EN 1347) there are no limit values, but it is left to the producer to declare the value to provide further information.

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

**Table 1 — Requirements for cementitious adhesives (C)**

<b>FUNDAMENTAL CHARACTERISTICS</b>		
<b>1 a</b>	<b>NORMAL SETTING ADHESIVES</b>	
<b>Characteristic</b>	<b>Requirement</b>	<b>Test Method</b>
Initial tensile adhesion strength	$\geq 0,5 \text{ N/mm}^2$	8.2 of EN 1348:2007
Tensile adhesion strength after water immersion	$\geq 0,5 \text{ N/mm}^2$	8.3 of EN 1348:2007
Tensile adhesion strength after heat ageing	$\geq 0,5 \text{ N/mm}^2$	8.4 of EN 1348:2007
Tensile adhesion strength after freeze-thaw cycles	$\geq 0,5 \text{ N/mm}^2$	8.5 of EN 1348:2007
Open time: tensile adhesion strength	$\geq 0,5 \text{ N/mm}^2$ after not less than 20 min	EN 1346
<b>1 b</b>	<b>FAST SETTING ADHESIVES</b>	
<b>Characteristic</b>	<b>Requirement</b>	<b>Test Method</b>
Early tensile adhesion strength	$\geq 0,5 \text{ N/mm}^2$ after not more than 6 h	8.2 of EN 1348:2007
Open time: tensile adhesion strength	$\geq 0,5 \text{ N/mm}^2$ after not less than 10 min	EN 1346
All other requirements as in Table 1a		EN 1348
<b>OPTIONAL CHARACTERISTICS</b>		
<b>1 c</b>	<b>SPECIAL CHARACTERISTICS</b>	
<b>Characteristic</b>	<b>Requirement</b>	<b>Test Method</b>
Slip	$\leq 0,5 \text{ mm}$	EN 1308
Extended open time: tensile adhesion strength	$\geq 0,5 \text{ N/mm}^2$ after not less than 30 min	EN 1346
Deformable adhesive: transverse deformation	$\geq 2,5 \text{ mm}$ and $< 5 \text{ mm}$	EN 12002
Highly deformable adhesive: transverse deformation:	$\geq 5 \text{ mm}$	EN 12002
<b>1 d</b>	<b>ADDITIONAL CHARACTERISTICS</b>	
<b>Characteristic</b>	<b>Requirement</b>	<b>Test Method</b>
High initial tensile adhesion strength	$\geq 1 \text{ N/mm}^2$	8.2 of EN 1348:2007
High tensile adhesion strength after water immersion	$\geq 1 \text{ N/mm}^2$	8.3 of EN 1348:2007
High tensile adhesion strength after heat ageing	$\geq 1 \text{ N/mm}^2$	8.4 of EN 1348:2007
High tensile adhesion strength after freeze-thaw cycles	$\geq 1 \text{ N/mm}^2$	8.5 of EN 1348:2007

### 4.2 Dispersion Adhesives (D)

All the dispersion adhesives shall comply with the characteristics specified in Table 2a. Tables 2b and 2c give the optional characteristics that can be required for special service conditions.

## EN 12004:2007+A1:2012 (E)

Table 2 — Requirements for Dispersion Adhesives (D)

2 a	FUNDAMENTAL CHARACTERISTICS		
	Characteristic	Requirement	Test Method
	Initial shear adhesion strength	$\geq 1 \text{ N/mm}^2$	7.2 of EN 1324:2007
	Shear adhesion strength after heat ageing	$\geq 1 \text{ N/mm}^2$	7.4 of EN 1324:2007
	Open time: tensile adhesion strength	$\geq 0,5 \text{ N/mm}^2$ after not less than 20 min	EN 1346
OPTIONAL CHARACTERISTICS			
2 b	SPECIAL CHARACTERISTICS		
	Characteristic	Requirement	Test Method
	Slip	$\leq 0,5 \text{ mm}$	EN 1308
	Extended open time: tensile adhesion strength	$\geq 0,5 \text{ N/mm}^2$ after not less than 30 min	EN 1346
2 c	ADDITIONAL CHARACTERISTICS		
	Characteristic	Requirement	Test Method
	Adhesion strength after water immersion	$\geq 0,5 \text{ N/mm}^2$	7.3 of EN 1324:2007
	Adhesion at elevated temperature	$\geq 1 \text{ N/mm}^2$	7.5 of EN 1324:2007

## 4.3 Reaction resin adhesives (R)

All the reaction resin adhesives for tiles shall comply with the characteristics specified in Table 3a.

Tables 3b and 3c give the optional characteristics that can be required for special service conditions.

Regarding the characteristic of chemical resistance (see EN 12808-1) there is no indication of limit value or chemical agent. The test media shall consist of the media to which the chemical resistant materials are to be exposed in service and the test conditions (temperature, concentration, etc.) shall simulate the anticipated service and exposure conditions as closely as possible.

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Table 3 — Requirements for reaction resin adhesives (R)

3 a	FUNDAMENTAL CHARACTERISTICS		
	Characteristic	Requirement	Test Method
	Initial shear adhesion strength	$\geq 2 \text{ N/mm}^2$	7.3 of [A1] EN 12003:2008 [A1]
	Shear adhesion strength after water immersion	$\geq 2 \text{ N/mm}^2$	7.4 of [A1] EN 12003:2008 [A1]
	Open time: tensile adhesion strength	$\geq 0,5 \text{ N/mm}^2$ after not less than 20 min	EN 1346
OPTIONAL CHARACTERISTICS			
3 b	SPECIAL CHARACTERISTICS		
	Characteristic	Requirement	Test Method
	Slip	$\leq 0,5 \text{ mm}$	EN 1308
3 c	ADDITIONAL CHARACTERISTICS		
	Characteristic	Requirement	Test Method
	Shear adhesion strength after thermal shock	$\geq 2 \text{ N/mm}^2$	7.5 of [A1] EN 12003:2008 [A1]