



SLOVENSKI STANDARD
SIST EN 1346:1998

01-april-1998

Adhezivni sredstva za lepilo - Določitev odprtega časa

Adhesives for tiles - Determination of open time

Mörtel und Klebstoffe für Fliesen und Platten - Bestimmung der offenen Zeit

Colles a carrelage - Détermination du temps ouvert

Ta slovenski standard je istoveten z: **EN 1346:1996**

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ICS:

83.180	Lepila	Adhesives
91.100.10	Cement. Mavec. Apno. Malta	Cement. Gypsum. Lime. Mortar

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EUROPEAN STANDARD

EN 1346

NORME EUROPÉENNE

EUROPÄISCHE NORM

December 1996

ICS 83.180; 91.100.10; 91.100.20

Descriptors: tiles, floor coverings, wall coverings, glue, tests, testing conditions, preparation, time measurements, adhesion

English version

Adhesives for tiles - Determination of open time

Colles à carrelage - Détermination du temps ouvert

Mörtel und Klebstoffe für Fliesen und Platten - Bestimmung der offenen Zeit

This European Standard was approved by CEN on 1996-11-25. CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

The European Standards exist 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 Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

Central Secretariat: rue de Stassart, 36 B-1050 Brussels

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Foreword

This European Standard 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of an identical text or by endorsement, at the latest by June 1997, and conflicting national standards shall be withdrawn at the latest by October 1997.

According to the CEN/CENELEC Internal Regulations, the national organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

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1 Scope

This European Standard describes the test method to be used to determine the open time of ceramic tile adhesives.

This standard is applicable to all ceramic tile adhesives for internal or external tile installations on walls and floors.

This European Standard does not contain performance requirements 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.).

2 Normative References

This European Standard incorporates, by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references subsequent amendments to, or revisions of, any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

EN 1066	Adhesives - Sampling
EN 1067	Adhesives - Examination and preparation of samples for testing
EN 159	Dust-pressed ceramic tiles with water absorption $E > 10$ - Group BIII
EN 196-1	Methods of testing cement - Determination of strength
EN 1323	Adhesives for tiles- Concrete slab for test
EN 1322	Adhesives for tiles- Definitions and terminology
prEN 12004	Adhesives for tiles- Definitions and specifications

3 Sampling

Take a 2 kg sample of the adhesive in accordance with EN 1066 and EN 1067.

4 Test conditions

Standard conditions shall be $(23 \pm 2)^\circ \text{C}$ and $(50 \pm 5)\% \text{ R.H.}$ and the air circulation in the testing area less than 0.2 m/s.

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5 Test materials

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Condition all test materials (adhesive, etc.) to be tested for at least 24 hours under standard conditions. The adhesive to be tested shall be within its shelf life, where this is specified.

5.1 Ceramic tiles

The tiles shall be checked prior to conditioning to ensure that they are new, clean and dry.

The tiles used for this method shall be of the following type:

type P1: porous body tile complying with EN159, of water absorption $(15 \pm 3) \%$ by mass, with plane adhering surface, cut to facial dimensions of $(50 \pm 1) \text{mm} \times (50 \pm 1) \text{mm}$.

5.2 Concrete Slab

The concrete slab shall comply with EN 1323.

6 Apparatus

6.1 Weight

A weight of less than 50mm x 50mm cross sectional area, capable of exerting a force of $(20 \pm 0,05)N$.

6.2 Pull- head plates

Square metallic plates, with dimensions of (50 ± 1) mm x (50 ± 1) mm and a minimum thickness of 10 mm with a suitable fitting for connection to the test machine.

6.3 Test machine

A test machine for direct pull tensile force test and with suitable capacity and sensitivity for the test. The machine shall be capable of applying the load to the pull-head plate at the rate of (250 ± 50) N/s through a suitable fitting that does not exert any bending force.

7 Mixing of adhesive

The amount of water and/or liquid admix required for preparing the adhesive shall be as stated by the adhesive manufacturer in parts by weight, i.e. liquid to dry powder (if a range of values is given, the average shall be used).

Prepare a minimum quantity of 2 kg of the adhesive in a mixer of the type described in clause 4.4 of EN 196, using the speed settings, (140 ± 5) rotation per minute and (62 ± 5) rotation per minute planetary movement.

Carry out the following procedure :

- pour the liquid into the pan
- scatter the dry powder over the liquid
- mix for 30 s
- take out the mixing paddle
- scrape down the paddle and pan within 1 min
- replace the paddle and mix for 1 min

Let the adhesive mature in accordance with the adhesive manufacturer's instructions, and then mix for a further 15 s.

In the case of ready-to-use dispersion adhesives or reaction resin adhesives, the manufacturer's instructions shall be followed.

8 Procedure

Apply a thin layer of the adhesive, mixed in accordance with clause 7, to the concrete slab with a straight edge trowel. Then apply a thicker layer and comb with a notched trowel having 6 mm x 6 mm notches at 12 mm centres for cementitious adhesives and 4 mm x 4 mm notches at 8 mm centres for dispersion adhesives and reaction resins adhesives.

Hold the trowel at an angle of approximately 60° to the substrate at a right angle to one edge of the slab and drawn across the slab parallel to that edge (in a straight line).

After 5, 10, 20 and 30 minutes place at least ten test tiles of type P1, 50 mm apart, on the adhesive and load each tile with $(20 \pm 0,05)$ N for 30 s.

After 27 days storage under standard conditions, bond the pull-head plates (see 6.2) to the tiles with a suitable high strength adhesive (e.g. epoxide adhesive).

After a further 24 hours storage under standard conditions determine the tensile adhesion strength of the adhesive by applying a force increasing at a constant rate of (250 ± 50) N/s.

9 Evaluation and expression of results

The individual tensile adhesion strengths are quoted to $0,1 \text{ N/mm}^2$ using the following formula:

$$A_s = L / A$$

where

A_s	is the individual tensile adhesion strength in N/mm^2
L	is the total tensile load in N
A	is the bonding area in mm^2 (2500 mm^2)

The tensile adhesion strength for each time interval is determined as follows :

- determine the mean of the ten values,
- discard the values falling out of the range of $\pm 20\%$ of the mean value,
- if five or more values remain, determine the new mean,
- if less than five values remain repeat the test,
- determine the mode of failure of the test units (see EN 1322).

The open time in minutes, is the maximum time interval at which the adhesive meets the tensile adhesion strength requirement defined in prEN 12004.

10 Test report

The test report shall provide the following information:

- number, title and issue of this European Standard;
- the place and date of sampling;
- type of adhesive, commercial designation and manufacturer name;
- identification of test sample;
- handling and storage of samples before testing;
- test conditions;
- date of testing;
- amount of water or liquid used for preparing the adhesive;
- test results (individual and mean values and the mode of failure);
- open time in minutes;
- any other factor that could have influenced the result.

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