



SLOVENSKI STANDARD

kSIST prEN 12808-3:2008

01-maj-2008

Grouts for tiles - Part 3: Determination of flexural and compressive strength

Grouts for tiles - Part 3: Determination of flexural and compressive strength

Mörtel und Klebstoffe für Fliesen und Platten — Teil 3: Bestimmung der Biege- und Druckfestigkeit

Mortiers de joints pour carrelage - Partie 3: Détermination de la résistance à la flexion et à la compression

Ta slovenski standard je istoveten z: prEN 12808-3

ICS:

83.180

91.100.10

kSIST prEN 12808-3:2008

en,fr,de

February 2008

ICS 83.180; 91.100.10

Will supersede EN 12808-3:2001

English Version

Grouts for tiles - Part 3: Determination of flexural and compressive strength

Mortiers de joints pour carrelage - Partie 3: Détermination de la résistance à la flexion et à la compression

This draft European Standard is submitted to CEN members for unique acceptance procedure. It has been drawn up by the Technical Committee CEN/TC 67.

If this draft becomes a European Standard, 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.

This draft European Standard was established by CEN 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 CEN Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, 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 and United Kingdom.

Warning : This document is not a European Standard. It is distributed for review and comments. It is subject to change without notice and shall not be referred to as a European Standard.



EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: rue de Stassart, 36 B-1050 Brussels

Contents

Page

Foreword.....	3
1 Scope	4
2 Normative references	4
3 Sampling.....	4
4 Test conditions	4
5 Test materials.....	4
6 Apparatus	4
7 Procedure	5
7.1 Mixing of grouts.....	5
7.2 Preparation of test specimens	5
7.3 Flexural strength under standard conditions.....	6
7.4 Compressive strength under standard conditions	6
7.5 Flexural and compressive strength after freeze-thaw cycles	6
8 Evaluation of results	6
8.1 Flexural strength.....	6
8.2 Compressive strength.....	7
9 Test report	7
Bibliography.....	9

Foreword

This document (prEN 12808-3:2008) has been prepared by Technical Committee CEN/TC 67 “Ceramic tiles”, the secretariat of which is held by UNI.

This document is currently submitted to the Unique Acceptance Procedure.

This document will supersede EN 12808-3:2001.

This document is one of a series of European Standards for ceramic tile adhesives including:

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

EN 12808-2, *Grouts for tiles – Part 2: Determination of resistance to abrasion*

EN 12808-3, *Grouts for tiles – Part 3: Determination of flexural and compressive strength*

EN 12808-5, *Grouts for tiles – Part 5: Water absorption*

1 Scope

This European Standard applies to all ceramic tile grouts for internal and external tile installations on walls and floors.

This European Standard describes the test method to be used to determine the compressive and flexural strength of ceramic tile grouts.

This European Standard does not contain performance requirements or recommendations for the design and installation of ceramic tiles.

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

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 196-1:2005, *Method of testing cement – Part 1: Determination of strength*

EN 1067, *Adhesives - Examination and preparation of samples for testing*

EN ISO 15605, *Adhesives – Sampling (ISO 15605:2000)*

3 Sampling

Take a sample of at least 2 kg of the product to be tested in accordance with EN ISO 15605 and EN 1067.

4 Test conditions

Standard conditions shall be $(23 \pm 2)^{\circ}\text{C}$ and $(50 \pm 5)\%$ R.H. and a speed of air in the working area less than 0,2 m/s.

5 Test materials

Condition all test materials for at least 24 hours under standard conditions.

6 Apparatus

6.1 Three gang mould shall consist of three horizontal compartments so that three prismatic specimens 40 mm x 40 mm x 160 mm can be prepared simultaneously. (See EN 196-1:2005, clause 4.5).

6.2 Jolting apparatus or jolting table used for the compaction of 40 mm x 40 mm x 160 mm grout specimen; shall comply with clause 4.6 of EN 196-1:2005.

6.3 Flexural strength testing machine shall be capable of applying the load with suitable capacity and sensitivity for the test. The machine shall be provided with a flexure device in accordance with Clause 4.7 of EN 196 part 1. (See Figure 1).

6.4 Compressive strength testing machine shall comply with Clause 4.8 of EN 196-1:2005. The test requires the use of a jig (in accordance with clause 4.9 of EN 196-1:2005) to be incorporated in the lower platen; the upper platen receives the load from the machine through an intermediate spherical seating. (See Figure 2).

7 Procedure

7.1 Mixing of grouts

The amount of water and/or liquid admix required for preparing the cementitious grout shall be as stated by the manufacturer in parts by weight, i.e. liquid to dry powder.

Prepare at least 2 kg of the grout in a mixer of the type described in Clause 4.4 of EN 196-1:2005, using the slow speed settings, (140 ± 5) rpm rotation and (62 ± 5) rpm 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 grout mature if and as specified in the manufacturer's instructions, and then mix for a further 15 s.

In the case of reaction resin grouts follow the manufacturer's instructions.

7.2 Preparation of test specimens

Mould the specimens immediately after the preparation of the grout, with the mould firmly clamped to the jolting table.

Introduce, using a suitable scoop, the first of two layers of grout into each of the compartments, directly from the mixing bowl. Spread the layer uniformly, then compact using 60 jolts.

Introduce the second layer of grout, level and compact with a further 60 jolts.

Lift the mould gently from the jolting table, strike off excess of material and smooth the surface with a flat trowel. Wipe off the grout left on the perimeter of the mould.

Cover the mould with a plate glass sheet according to EN 196-1.

Place the mould, suitably identified, on a horizontal base in standard conditions, $(23 \pm 2)^{\circ}\text{C}$ and $(50 \pm 5)\%$ R.H.

After 24 hours carefully remove the specimen from the mould.

Keep the demoulded prism in standard conditions for 27 days, leaving a clearance of at least 25 mm on all sides.

Prepare three specimen for each grout.

7.3 Flexural strength under standard conditions

After conditioning has been completed place the prism in the testing machine (6.3) with one side face on the supporting rollers and with the longitudinal axis normal to the support.

Apply the load vertically in accordance with the procedure described in clause 9.2 of EN 196-1:2005.

Keep the prism halves in standard conditions until tested in compression.

7.4 Compressive strength under standard conditions

Test the prism halves broken in flexion, by means of the equipment specified in 6.4 and following the procedure described in clause 9.3 of EN 196-1:2005.

7.5 Flexural and compressive strength after freeze-thaw cycles

Prepare the test units in accordance with 7.2.

Condition the test units for 6 days in standard conditions and then immerse in water for 21 days before carrying out 25 freeze-thaw cycles, in accordance with the following procedure.

For each freeze-thaw cycle:

- remove the test units from the water and lower the temperature to $(-15 \pm 3)^\circ\text{C}$ within 2 hours \pm 20 min;
- maintain the test units at $(-15 \pm 3)^\circ\text{C}$ for 2 hours \pm 20 min;
- immerse the test units in water at $(20 \pm 3)^\circ\text{C}$ and raise the temperature to $(15 \pm 3)^\circ\text{C}$ for at least 2 hours \pm 20 minutes.

Repeat the cycle 25 times.

Condition the test units for 3 days in standard conditions after the last cycle and prior to test examine them and record a brief description of surface appearance of the specimen. Determine the flexural strength in accordance with 7.3 and the compressive strength in accordance with 7.4.

8 Evaluation of results

8.1 Flexural strength

The flexural strength (R_f) is calculated from:

$$R_f = \frac{1,5 F_f L}{b^3} \text{ N/mm}^2 \quad (1)$$

where:

b is the length of the side of the square section of the prism (mm)

F_f is the load applied to the middle of the prism at fracture (N)