



SLOVENSKI STANDARD
SIST EN 13892-2:2003

01-september-2003

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Methods of test for screed materials - Part 2: Determination of flexural and compressive strength

Prüfverfahren für Estrichmörtel und Estrichmassen - Teil 2: Bestimmung der Biegezug- und Druckfestigkeit

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Méthodes d'essai des matériaux pour chapes - Partie 2: Détermination de la résistance a la flexion et a la compression

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Ta slovenski standard je istoveten z: EN 13892-2:2002

ICS:

91.100.10 Cement. Mavec. Apno. Malta Cement. Gypsum. Lime.
Mortar

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en

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ICS 91.100.10

English version

Methods of test for screed materials - Part 2: Determination of flexural and compressive strength

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compression

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Bestimmung der Biegezug- und Druckfestigkeit

This European Standard was approved by CEN on 9 October 2002.

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 Management Centre or to any CEN member.

This European Standard exists 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 Management Centre has the same status as the official versions.

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

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

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Foreword

This document (EN 13892-2:2002) has been prepared by Technical Committee CEN/TC 303, "Floor screeds and in-situ floorings in buildings", the secretariat of which is held by DIN.

It was prepared by Working Group 2 "Screed materials and floor screeds-Test-methods" taking into account the proposals submitted by Working Group 1 "Screed materials and floor screeds-Definitions, properties and requirements".

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 May 2003, and conflicting national standards shall be withdrawn at the latest by May 2003.

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

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1 Scope

This European Standard specifies a method for determining the flexural and compressive strength of moulded specimens made from cementitious screed-, calcium sulphate screed-, magnesite screed- and synthetic resin screed material.

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 (including amendments).

EN 196-1, *Methods of testing cement - Part 1: Determination of strength.*

EN 13813, *Screed material and floor screeds - Screed material - Properties and requirements.*

EN 13892-1, *Methods of test for screed materials – Part 1: Sampling, making and curing specimens for test.*

EN ISO 6507-1, *Metallic materials - Vickers hardness test - Part 1: Test method (ISO 6507-1:1997).*

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3 Principle

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The flexural and compressive strengths are measured on specimens made in accordance with EN 13892-1. The flexural test is carried out first. The flexural strength is determined from the load required to cause failure of the test specimen under midspan bending.

The two halves of the broken test specimen are then used in the compression test. Each is tested using a uniformly distributed compressive load applied over a portion of the broken prism. The compressive strength is determined from the load required to cause failure.

4 Symbols and abbreviations

F_f is the load in Newtons (N) required to cause failure in the flexural test.

F_c is the load in Newtons (N) required to cause failure in the compression test.

l is the distance in millimeters (mm) between the axes of the support rollers in the flexural test.

b is the width of the test specimen in millimeters (mm) under the central roller in the flexural test in the “as tested” mode; b is the depth in the “as cast” mode.

d is the depth of the test specimen in millimeters (mm) under the central roller in the flexural test in the “as tested” mode; d is the width in the “as cast” mode.

A is the area of the compressive strength specimen in contact with the bearing plates (nominally 1600 mm²)

R_f is the flexural strength in N/mm² as determined from the test parameters.

R_C is the compression strength in N/mm^2 as determined for the test parameters.

5 Apparatus

5.1 Testing machine

The testing machine described in EN 196-1 meets the requirements set out below.

The testing machine shall be of suitable capacity and sensitivity such that the specimen can be expected to fracture in that part of the range which is certified to be accurate to $\pm 2\%$ of the indicated load, that is normally in the upper four fifths of the range.

5.2 Apparatus specific to each test

5.2.1 Flexural test

A test bed consisting of two steel supporting rollers of lengths between 44 mm and 50 mm and $(10 \pm 0,5)$ mm diameter, spaced $(100,0 \pm 0,5)$ mm apart, and a third steel roller of the same length and diameter located centrally between the support rollers. The three vertical planes through the axes of the three rollers shall be parallel and remain parallel, equidistant and normal to the direction of the prism under test. One of the supporting and the loading roller shall be capable of tilting slightly to allow a uniform distribution of the load over the width of the prism without subjecting it to any torsional stresses.

5.2.2 Compression test

a) The upper machine platen shall be able to align freely as contact is made with the specimen, but the platens shall be restrained from tilting with respect to one another during loading.

b) Two bearing plates made of tungsten carbide or of steel of surface hardness at least 600 HV (VICKERS hardness value, see EN ISO 6507-1). The plates shall be 40,0 mm long, $(40,0 \pm 0,1)$ mm wide and 10 mm thick. The dimensional tolerance for the width shall be based on the average of four symmetrically placed measurements. The flatness tolerance for the contact faces shall be 0,01 mm.

c) Jig to ensure correct location of the specimen and bearing plates in relation to the platens on the test machine.

6 Procedure

6.1 Flexural test

Three specimens 40 mm x 40 mm x 160 mm prepared as specified in EN 13892-1 shall be tested.

Test each specimen 28 days after casting and immediately on being removed from the storage atmosphere.

Where the manufacture can demonstrate that the required classes of properties can be achieved at an earlier age, this age may be included in the designation provided all declared class values are achieved at this age.

The sides of each specimen shall be wiped with a clean cloth to remove any loose material. The specimen shall be weighed, the width and depth of the specimen shall be measured mid way along its length and the density shall be calculated.

NOTE: The depth is the dimension between the two cast sides.

The bearing of the rollers shall be wiped to remove any grit or other material, and the specimen shall be placed with one side as cast centrally in both directions on the supporting rollers.

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The load shall be applied without shock at a uniform rate of (50 ± 10) N/sec until failure.

The maximum load applied, F_f in N (Newtons), shall be recorded. The two half specimens shall be returned to the storage chamber and shall be kept there if required, for compressive strength measurements.

The flexural strength, R_f in N/mm^2 , shall be calculated, using the following equation:

$$R_f = \frac{1,5F_f \cdot l}{bd^2} \text{ N/mm}^2$$

The flexural strength shall be recorded to the nearest $0,05 \text{ N/mm}^2$ for individual specimens and to the nearest $0,1 \text{ N/mm}^2$ for the mean of the three tests.

6.2 Compression test

The six specimens resulting from the flexural test shall be tested on the same day as the flexural test.

Any loose grit or other material shall be removed from the sides of the specimen as cast. The bearing surface of the testing machine and the bearing plates shall be wiped with a clean cloth and the specimen shall be placed in the machine using the jig in such a manner that the load is applied to the side and not to the top as cast.

The prism shall be arranged so that the cast end protrudes 16 mm beyond the nearer edge of the bearing plates. Any specimens shall be discarded that do not provide a cube of solid material between the top and bottom bearing plates. The specimen shall be carefully aligned so that the load will be applied to the whole width of the faces in contact with the plates. Using the location jig, the assembly shall be centred carefully on the lower platen of the test machine.

The load shall be applied without shock and increased continuously at a rate of (2400 ± 200) N/sec until failure.

The maximum load applied, F_c in N (Newtons), shall be recorded during the test.

The compressive strength shall be calculated as the maximum load carried by the specimen divided by the cross-sectional area of the specimen in contact with the bearing plate.

$$R_c = \frac{F_c}{A}$$

where $A = 40 \text{ mm} \times 40 \text{ mm}$.

The compressive strength shall be recorded to the nearest $0,05 \text{ N/mm}^2$ for individual results and to the nearest $0,1 \text{ N/mm}^2$ the mean strength of six specimens.

7 Test report

The test report shall include the following information:

- a) number, title and date of issue of this European Standard;
- b) name and address of the laboratory carrying out the tests and name and address of the laboratory preparing the samples (if different);
- c) identification number of the test report;
- d) name and address of the manufacturer or supplier of the product;