



SLOVENSKI STANDARD
SIST EN 14488-7:2006
01-oktober-2006

Preskušanje brizganega betona – 7. del: Vsebnost vlaken v vlaknatem armiranem betonu

Testing sprayed concrete - Part 7: Fibre content of fibre reinforced concrete

Prüfung von Spritzbeton - Teil 7: Fasergehalt von faserverstärktem Beton

Essais pour béton projeté - Partie 7: Teneur en fibres du béton renforcé par des fibres

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Ta slovenski standard je istoveten z: EN 14488-7:2006

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ICS:

91.100.30 Beton in betonski izdelki Concrete and concrete products

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en

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English Version

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This European Standard was approved by CEN on 27 February 2006.

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.

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 Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, 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.

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Foreword

This European Standard (EN 14488-7:2006) has been prepared by Technical Committee CEN/TC 104 "Concrete and related products", the secretariat of which is held by DIN.

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of an identical text or by endorsement, at the latest by October 2006, and conflicting national standards shall be withdrawn at the latest by December 2007.

This European Standard is part of a series concerned with testing sprayed concrete.

This series EN 14488 'Testing sprayed concrete' includes the following parts:

- Part 1: Sampling fresh and hardened concrete
- Part 2: Compressive strength of young sprayed concrete
- Part 3: Flexural strengths (first peak, ultimate and residual) of fibre reinforced beam specimens
- Part 4: Bond strength of cores by direct tension
- Part 5: Determination of energy absorption capacity of fibre reinforced slab specimens
- Part 6: Thickness of concrete on a substrate
- Part 7: Fibre content of fibre reinforced concrete

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, 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.

1 Scope

This part of European Standard specifies a method for the determination of the fibre content of sprayed concrete from either a fresh or hardened (i.e. before or after set) concrete sample. Only the method using a fresh sample is appropriate with polymer fibres, while both types are applicable with steel fibres.

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 12350-6, *Testing fresh concrete - Part 6: Density*

EN 12390-7, *Testing hardened concrete - Part 7: Density of hardened concrete*

EN 12504-1, *Testing concrete in structures - Part 1: Cored specimens - Testing, examining and testing in compression*

EN 14488-1, *Testing sprayed concrete - Part 1: Sampling fresh and hardened concrete*

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3 Principle

Fibres are extracted from a hardened (Method A) or fresh (Method B) concrete sample and the fibre content is determined from their mass and the volume of the concrete sample.

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4 Apparatus

4.1 Balance or scale capable of determining the mass of the concrete sample and extracted fibres to the required accuracy.

4.2 Container to support and suspend a sample in water in order to determine its mass.

4.3 Water tank suitable for the immersion of samples in water at (20 ± 2) °C.

4.4 Trowel, or similar cutting device, made from a non-absorbent material not readily attacked by cement paste, suitable for cutting a concrete sample from fresh, in situ sprayed concrete.

5 Test specimens

5.1 General

Fresh samples may be extracted from the basic mix, the in situ material or from a test panel. Hardened samples may be cut from the in situ material or from a test panel. It should be noted that the fibre content at each of these locations may be different, due to the spraying process. The most appropriate sample type and location should be used, which will depend on the purpose of the quality control and on the compliance requirements of the specification.

For hardened samples the test may be conducted in as received, saturated or oven-dried moisture states.

5.2 Hardened sample (Method A)

Three test cores shall be cut from the in situ material or a test panel in accordance with the requirements of EN 14488-1 and EN 12504-1. The core diameter shall be between 50 mm and 100 mm, and the core length shall be between 75 mm and 150 mm (unless the layer thickness is less than 75 mm, in which case the core length should equal the layer thickness).

5.3 Fresh sample (Method B)

Three test samples (coupons) shall be cut from the in situ material or a test panel with a trowel or similar tool. Fibres protruding from the remaining material shall not be extracted and added to the sample. Wherever possible, each coupon should consist of a single piece of sprayed concrete cut from the full depth of the sprayed concrete layer or panel. The latter is to ensure a representative sample is obtained, taking into account any differences in fibre content with depth. Each sample should weigh between 1 kg and 2 kg.

6 Procedures

6.1 General

The volume of the sample (before fibre extraction) is determined by calculation (using actual dimensions) or by water displacement (reference method).

The mass of the fibres is then determined by weighing, following extraction of the fibres from the fresh or hardened sample.

6.2 Volume of hardened specimen (Method A)

The volume (V_d) of each core shall be determined according to the calculation (using actual dimensions) or weighing in water methods given in EN 12390-7. The hardened density may also be determined in accordance with EN 12350-6.

6.3 Volume of fresh specimen (Method B)

The volume (V_d) of each coupon shall be determined by the weighing in water method given in EN 12350-6. Each coupon is weighed in air, then upon immersion in water. The wet density and volume of the sample are then calculated. These measurements shall be made before final set of the concrete if the fibres are to be extracted according to 6.5.

6.4 Mass of fibres from hardened sample (Method A)

The concrete core shall be crushed in a compression testing machine, or other suitable device, so that all the fibres can be separated from the concrete. Magnetic fibres can be easily removed by a magnet.

The fibres shall be cleaned mechanically to remove any cementitious residue that is clearly visible by naked eye, and then weighed (m_f) to 0,1g.

6.5 Mass of fibres from fresh sample (Method B)

Wash out the fibres from the sprayed concrete sample. The sprayed concrete shall be placed in a sieve or filter equipment where the cement and other fine materials can be washed out such that the fibres can be separated from the mass. With synthetic fibres the sample may be soaked with alcohol and stirred until the fibres float on the surface.

The fibres shall be cleaned, dried and then weighed (m_f) to 0,1 g for steel fibres or 0,01 g for polymer fibres.

7 Expression of results

The fibres content shall be calculated from the determined fibres mass and sample volume, using the formula:

$$C_f = \frac{m_f \times 1000}{V_d} \quad (1)$$

where

C_f is the fibres content in kg/m³

m_f is the mass of fibres extracted from the sample in g

V_d is the volume of the sample in m³

8 Test report

The report shall include:

- a) identification of the test specimen;
- b) description of the fibres type;
- c) description of the method (A or B);
- d) mass of each specimen to nearest 10 g;
- e) mass of the fibres in each specimen to nearest 0,1 or 0,01 g as appropriate;
- f) calculated fibres content of each specimen to nearest 1 kg/m³;
- g) the average value of fibres content and the standard deviation;
- h) any deviation from this standard;
- i) declaration from the person technically responsible for the test that the testing was carried out in accordance with this standard, except as detailed in item h).

The report may also include:

- j) density (fresh or hardened) of each specimen to nearest 10 kg/m³.

9 Accuracy

There are currently no accuracy data for this test.