Testing sprayed concrete - Part 4: Bond strength of cores by direct tension

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EESTI STANDARDIKESKUS
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EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN 14488-4:2005+A1:2008 sisaldab Euroopa standardi EN 14488-4:2005+A1:2008 ingliskeelset teksti.	This Estonian standard EVS-EN 14488-4:2005+A1:2008 consists of the English text of the European standard EN 14488-4:2005+A1:2008.
Standard on kinnitatud Eesti Standardikeskuse 19.05.2008 käskkirjaga ja jõustub sellekohase teate avaldamisel EVS Teatajas.	This standard is ratified with the order of Estonian Centre for Standardisation dated 19.05.2008 and is endorsed with the notification published in the official bulletin of the Estonian national standardisation organisation.
Euroopa standardimisorganisatsioonide poolt rahvuslikele liikmetele Euroopa standardi teksti kättesaadavaks tegemise kuupäev on 12.03.2008.	Date of Availability of the European standard text 12.03.2008.
Standard on kättesaadav Eesti standardiorganisatsioonist.	The standard is available from Estonian standardisation organisation.

ICS 91.100.30

Võtmesõnad: bond strength, concretes, construction, construction materials, laboratory testing, methods, sprayed concrete, strength of materials, tensile force, test equipment, test reports, testing, testing conditions

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 14488-4:2005+A1

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Supersedes EN 14488-4:2005

English Version

Testing sprayed concrete - Part 4: Bond strength of cores by direct tension

Essais pour béton projeté - Partie 4: Adhérence en traction directe sur carottes

Prüfung von Spritzbeton - Teil 4: Haftfestigkeit an Bohrkernen bei zentrischem Zug

This European Standard was approved by CEN on 17 April 2005 and includes Amendment 1 approved by CEN on 21 January 2008.

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 CEN 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 CEN Management Centre has the same status as the official versions.

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Foreword

This document (EN 14488-4:2005+A1:2008) 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 September 2008 and conflicting national standards shall be withdrawn at the latest by September 2008.

This document includes Amendment 1, approved by CEN on 2008-01-21.

This document supersedes EN 14488-4:2005.

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

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

⟨A1⟩ *deleted text* ⟨A1⟩

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, 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 European Standard describes a means of determining the tensile bond between sprayed concrete and substrate of concrete or rock tested in a laboratory as a direct tension test. Bond strength is defined as the capacity to transfer tension between two layers. Bond strength is calculated as the ultimate tensile force divided by the stressed cross-sectional area of a core, drilled out of a sprayed concrete layer together with a portion of the substrate concrete or rock.

〈A1〉 Alternative in situ test methods for determining bond strength are allowed provided they meet all the requirements of this European Standard. In case of dispute, the method described in this European Standard is the reference test method. 〈A1〉

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 10002-1, *Metallic materials — Tensile testing — Part 1: Method of test at ambient temperature*

EN 12390-1, *Testing hardened concrete — Part 1: Shape, dimensions and other requirements for specimens and moulds*

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

3 Principle

A core with a diameter (d) of 50 mm–100 mm and a length of more than 2 d is drilled through the sprayed concrete layer and the concrete or rock substrate. The core is cross-cut so that the bonding zone is near to the middle of the test specimen and the length is 2 d, after which steel dollies are glued onto the ground end surfaces of the core and the test specimen is subjected to increasing stress until it fractures. The values obtained are assessed with regard to the nature of the fracture, and classified as belonging to one of two types:

a) Fracture in the bonding zone which gives the actual bond strength. This also includes the special case in which no bonding between the layers is obtained.

b) Fracture where the fracture surface is not entirely in the bonding zone, which means that the bond strength is greater than the value of ultimate stress obtained in this case.

4 Apparatus

4.1 Tensile testing machine of class 2 or better, in accordance with EN 10002-1 which makes it possible to measure the stress within ± 2 % accuracy, and to regulate the increase in stress within the range of (0,05 ± 0,01) MPa/s.

4.2 Stone saw and surface grinder

4.3 Steel dollies (two for each test specimen), with diameters equal to the core diameter (± 1 mm) and a thickness of at least 0,4 times the dolly diameter. The surface to be glued shall be flat to within ± 0,05 mm.