Tooted ja süsteemid betoonkonstruktsioonide kaitseks ja parandamiseks. Määratlused, nõuded, kvaliteedikontroll ja vastavuse hindamine. Osa 4: Konstruktsioonide ühendamine

Products and systems for the protection and repair of concrete structures - Definitions, requirements, quality control and evaluation of conformity - Part 4: Structural bonding

EESTI STANDARDI EESSÕNA **NATIONAL FOREWORD**

Käesolev Eesti standard EVS-EN 1504-4:2005 sisaldab Euroopa standardi EN 1504-4:2004 ingliskeelset teksti. Käesolev dokument on jõustatud 25.01.2005 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes. Standard on kättesaadav Eesti standardiorganisatsioonist.	This Estonian standard EVS-EN 1504-4:2005 consists of the English text of the European standard EN 1504-4:2004. This document is endorsed on 25.01.2005 with the notification being published in the official publication of the Estonian national standardisation organisation. The standard is available from Estonian standardisation organisation.

Käsitlusala: This Part 4 of EN 1504 specifies requirements for the identification, performance (including durability) and safety of structural bonding products and systems to be used for the structural bonding of strengthening materials to an existing concrete structure, including: 1) The bonding of external plates of steel or other suitable materials (e.g. fibre reinforced composites) to the surface of a concrete structure for strengthening purposes, including the laminating of plates in such applications. 2) The bonding of hardened concrete to hardened concrete, typically associated with the use of precast units in repair and strengthening. 3) The casting of fresh concrete to hardened concrete using an adhesive bonded joint where it forms a part of the structure and is required to act compositely.	**Scope:** This Part 4 of EN 1504 specifies requirements for the identification, performance (including durability) and safety of structural bonding products and systems to be used for the structural bonding of strengthening materials to an existing concrete structure, including: 1) The bonding of external plates of steel or other suitable materials (e.g. fibre reinforced composites) to the surface of a concrete structure for strengthening purposes, including the laminating of plates in such applications. 2) The bonding of hardened concrete to hardened concrete, typically associated with the use of precast units in repair and strengthening. 3) The casting of fresh concrete to hardened concrete using an adhesive bonded joint where it forms a part of the structure and is required to act compositely.

ICS 01.040.91, 91.080.40

Võtmesõnad:

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 1504-4

November 2004

ICS 91.080.40

English version

Products and systems for the protection and repair of concrete structures - Definitions, requirements, quality control and evaluation of conformity - Part 4: Structural bonding

Produits et systèmes pour la protection et la réparation de structures en béton - Définitions, prescriptions, maîtrise de la qualité et évaluation de la conformité - Partie 4: Collage structural

Produkte und Systeme für den Schutz und die Instandsetzung von Betontragwerken - Definitionen, Anforderungen, Qualitätsüberwachung und Beurteilung der Konformität - Teil 4: Kleber für Bauzwecke

This European Standard was approved by CEN on 23 April 2004.

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, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

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

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

Ref. No. EN 1504-4:2004: E

Contents

Page

Foreword

This document (EN 1504-4:2004) has been prepared by Technical Committee CEN/TC 104 “Concrete and related products”, the secretariat of which is held by DIN.

It has been developed by sub-committee 8 “Products and systems for the protection and repair of concrete structures” (Secretariat AFNOR).

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 February 2005, and conflicting national standards shall be withdrawn at the latest by August 2006.

This Part 4 of EN 1504 does not supersede any other document.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Construction Products Directive (89/106/EC).

For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this document.

This Part 4 of EN 1504 includes an Informative Annex A dealing with special applications and an Informative Annex B dealing with release of dangerous substances.

This Part of this European Standard is one of the Parts of this Standard on products and systems for the repair and protection of concrete structures, the other Parts are listed below:

EN 1504-1, *Products and systems for the protection and repair of concrete structures - Definitions, requirements, quality control and evaluation of conformity - Part 1: Definitions*

prEN 1504-2, *Products and systems for the protection and repair of concrete structures - Definitions, requirements, quality control and evaluation of conformity - Part 2: Surface protection systems for concrete*

prEN 1504-3, *Products and systems for the protection and repair of concrete structures - Definitions, requirements, quality control and evaluation of conformity - Part 3: Structural and non-structural repair*

prEN 1504-5, *Products and systems for the protection and repair of concrete structures - Definitions, requirements, quality control and evaluation of conformity - Part 5: Concrete injection*

prEN 1504-6, Products and systems for the protection and repair of concrete structures - Definitions, requirements, quality control and evaluation of conformity - Part 6: Anchoring of reinforcing steel bar

prEN 1504-7, *Products and systems for the protection and repair of concrete structures - Definitions, requirements, quality control and evaluation of conformity - Part 7: Reinforcement corrosion protection*

EN 1504-8 *Products and systems for the protection and repair of concrete structures - Definitions, requirements, quality control and evaluation of conformity - Part 8: Quality control and evaluation of conformity*

ENV 1504-9:, *Products and systems for the protection and repair of concrete structures - Definitions, Requirements, Quality control and evaluation of conformity - Part 9: General principles for the use of products and systems*

EN 1504-10, *Products and systems for the protection and repair of concrete structures - Definitions, Requirements, Quality control and evaluation of conformity - Part 10: Site application of products and systems and quality control of the works*

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, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

1 Scope

This Part 4 of EN 1504 specifies requirements for the identification, performance (including durability) and safety of structural bonding products and systems to be used for the structural bonding of strengthening materials to an existing concrete structure, including:

1) The bonding of external plates of steel or other suitable materials (e.g. fibre reinforced composites) to the surface of a concrete structure for strengthening purposes, including the laminating of plates in such applications.

2) The bonding of hardened concrete to hardened concrete, typically associated with the use of precast units in repair and strengthening.

3) The casting of fresh concrete to hardened concrete using an adhesive bonded joint where it forms a part of the structure and is required to act compositely.

The performance requirements in this Part of this Standard may not be applicable to highly specialised applications in extreme environmental conditions, e.g. cryogenic use, nor do they cover specialised circumstances such as accidental impact, e.g. due to traffic or ice, or earthquake loading where specific performance requirements will apply.

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 1504-1, *Products and systems for the protection and repair of concrete structures - Definitions, requirements, quality control and evaluation of conformity - Part 1: Definitions*

EN 1504-8, *Products and systems for the protection and repair of concrete structures - Definitions, requirements, quality control and evaluation of conformity - Part 8: Quality control and evaluation of conformity*

ENV 1504-9, *Products and systems for the protection and repair of concrete structures - Definitions, Requirements, Quality control and evaluation of conformity - Part 9: General principles for the use of products and systems*

EN 1766, *Products and systems for the protection and repair of concrete structures - Test methods - Reference concretes for testing*

EN 1767, *Products and systems for the protection and repair of concrete structures - Test methods - Infrared analysis*

EN 1770, *Products and systems for the protection and repair of concrete structures - Test methods - Determination of the coefficient of thermal expansion*

EN 1799, *Products and systems for the protection and repair of concrete structures - Test methods - Tests to measure the suitability of structural bonding agents for application to concrete surface*

EN 12188, *Products and systems for the protection and repair of concrete structures - Test methods - Determination of adhesion steel-to-steel for characterisation of structural bonding agents*

EN 12189, *Products and systems for the protection and repair of concrete structures - Test methods - Determination of open time*

EN 12190, *Products and systems for the protection and repair of concrete structures - Test methods - Determination of compressive strength of repair mortar*

EN 12192-2, *Products and systems for the protection and repair of concrete structures - Granulometry analysis - Part 2: Test method for fillers for polymer bonding agents*

EN 12614, *Products and systems for the protection and repair of concrete structures - Test methods - Determination of glass transition temperatures of polymers*

EN 12615, *Products and systems for the protection and repair of concrete structures - Test methods - Determination of slant shear strength*

EN 12617-1, *Products and systems for the protection and repair of concrete structures - Test methods - Part 1: Determination of linear shrinkage for polymers and surface protection systems (SPS)*

EN 12617-3, *Products and systems for the protection and repair of concrete structures - Test methods - Part 3: Determination of early age linear shrinkage for structural bonding agents*

EN 12618-2, *Products and systems for the protection and repair of concrete structures - Test methods - Part 2: Determination of the adhesion of injection products, with our without thermal cycling - Adhesion by tensile bond strength*

EN 12636, *Products and systems for the protection and repair of concrete structures - Test methods - Determination of adhesion concrete to concrete*

EN 13412, *Products and systems for the protection and repair of concrete structures - Test methods - Determination of modulus of elasticity in compression*

EN 13501-1, *Fire classification of construction products and building elements - Part 1: Classification using test data from reaction to fire tests*

EN 13733, *Products and systems for the protection and repair of concrete structures - Tests methods - Determination of the durability of structural bonding agents*

EN ISO 178, *Plastics - Determination of flexural properties (ISO 178:2001)*

EN ISO 3451-1, *Plastics - Determination of ash - Part 1: General methods (ISO 3451-1:1997)*

EN ISO 9514, *Paints and varnishes - Determination of the pot-life of liquid systems - Preparation and conditioning of samples and guidelines for testing (ISO 9514:1992)*

EN ISO 11358, *Plastics - Thermogravimetry (TG) of polymers - General principles (ISO 11358:1997)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 1504-1, EN 1504-8and ENV 1504-9 and the following apply.

3.1
structural bonding products and systems
products and systems applied to concrete to provide a durable structural bond to additional applied material

3.2
polymer mortars and polymer concretes (PC)
blended mixtures of polymer binder and graded aggregates which set by polymer reaction