

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

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN 1504-9:2008 sisaldab Euroopa standardi EN 1504-9:2008 ingliskeelset teksti.

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English Version

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

Produits et systèmes pour la protection et la réparation de structures en béton - Définitions, exigences et maîtrise de la qualité et évaluation de la conformité - Partie 9: Principes généraux d'utilisation des produits et systèmes

Produkte und Systeme für den Schutz und die Instandsetzung von Betontragwerken - Definitionen, Anforderungen, Qualitätsüberwachung und Beurteilung der Konformität - Teil 9: Allgemeine Grundsätze für die Anwendung von Produkten und Systemen

This European Standard was approved by CEN on 27 July 2008.

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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 1504-9:2008) 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of an identical text or by endorsement, at the latest by March 2009, and conflicting national standards shall be withdrawn at the latest by March 2009.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

It has been prepared by Sub-committee 8 "Products and systems for the protection and repair of concrete structures" (Secretariat AFNOR).

This document supersedes ENV 1504-9:1997.

Modifications to ENV 1504-9:1997 are:

- a) Status of document changed from pre-standard to standard;
- b) Editorial and technical modifications in those cases where necessary.

This document is one part of the European Standard on "Products and systems for the protection and repair of concrete structures — Definitions, requirements, quality control and evaluation of conformity". The other parts are listed below:

- *Part 1: Definitions*
- *Part 2: Surface protection systems for concrete*
- *Part 3: Structural and non-structural repair*
- *Part 4: Structural bonding*
- *Part 5: Concrete injection*
- *Part 6: Anchoring of reinforcing steel bar*
- *Part 7: Reinforcement corrosion protection*
- *Part 8: 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, 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 the United Kingdom.

Introduction

Protection and repair of concrete structures require complex design work. This European Standard defines the principles for protection and repair of concrete structures which have suffered or may suffer damage or deterioration and gives guidance on the selection of products and systems which are appropriate for the intended use.

This European Standard identifies key stages in the repair process:

- assessment of the condition of the structure;
- identification of the causes of deterioration;
- deciding the options for protection and repair;
- selection of the appropriate principle(s) of protection and repair;
- selection of methods;
- definition of properties of products and systems;
- specification of maintenance requirements following protection and repair.

This European Standard contains an Annex A (Informative) which provides guidance and background information on the Normative text.

1 Scope

This Part of EN 1504 sets out basic considerations for specification of protection and repair of reinforced and unreinforced concrete structures (including, for example, pavements, runways, floor slabs and pre-stressed structures) using products and systems specified in other Parts of the EN 1504 series or any other relevant European Standard or European Technical Approval. This European Standard covers atmospherically exposed, buried and submerged structures.

This European Standard includes:

- a) the need for inspection, testing and assessment before and after repair;
- b) protection from causes of defects and their repair in concrete structures. Causes of such defects may include:
 - 1) mechanical actions, e.g. impact, overloading, movement caused by settlement, blast, vibration and seismic actions;
 - 2) chemical and biological actions from environments, e.g. sulphate attack, alkali aggregate reaction;
 - 3) physical actions, e.g. freeze-thaw, thermal cracking, moisture movement, salt crystallisation and erosion;
 - 4) fire damage;
 - 5) reinforcement corrosion resulting from:
 - i) physical loss of the protective concrete cover;
 - ii) chemical loss of alkalinity in the protective concrete cover as a result of reaction with atmospheric carbon dioxide (carbonation);
 - iii) chloride (or other chemical) contamination of the concrete;
 - iv) stray electrical currents conducted or induced in the reinforcement from neighbouring electrical installations.
- c) repair of defects caused by inadequate design, specification or construction or use of unsuitable construction materials;
- d) providing the required structural capacity by:
 - 1) replacement or addition of embedded or external reinforcement;
 - 2) filling of cracks and voids within or between elements to ensure structural continuity;
 - 3) replacement or addition of concrete or whole elements;
- e) waterproofing as an integral part of protection and repair;
- f) principles and methods of protection and repair, for example those listed in Table 1.

Site application is covered in Part 10 of this European Standard.

Further background information on the scope of this European Standard is given in Annex A (Informative).

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 206-1, *Concrete — Part 1: Specification, performance, production and conformity*

EN 1504-1:2005, *Products and systems for the protection and repair of concrete structures — Definitions, requirements, quality control and evaluation of conformity — Part 1: Definitions.*

EN 1504-2:2004, *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*

EN 1504-3:2005, *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*

EN 1504-4:2004, *Products and systems for the protection and repair of concrete structures — Definitions, requirements, quality control and evaluation of conformity — Part 4: Structural bonding*

EN 1504-5:2004, *Products and systems for the protection and repair of concrete structures — Definitions, requirements, quality control and evaluation of conformity — Part 5: Concrete injection*

EN 1504-6:2006, *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*

EN 1504-7:2006, *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 1504-8:2004, *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*

EN 1504-10:2003, *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*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 1504-1, EN 1504-2, EN 1504-3, EN 1504-4, EN 1504-5, EN 1504-6, EN 1504-7, EN 1504-8, EN 1504-10 and the following apply.

3.1

defect

unacceptable condition that may be in-built or the result of deterioration or damage

3.2

design life

intended useful period of service under expected conditions of use of the concrete structure

3.3

maintenance

recurrent or continuous measures that provide repair and/or protection

3.4

passivity

state in which steel in concrete does not spontaneously corrode due to a protective oxide film