

**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**

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

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

<p>Käesolev Eesti standard EVS-EN 1504-10:2004 sisaldab Euroopa standardi EN 1504-10:2003 + AC:2005 ingliskeelset teksti.</p> <p>Käesolev dokument on jõustatud 18.05.2004 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes.</p> <p>Standard on kättesaadav Eesti standardiorganisatsioonist.</p>	<p>This Estonian standard EVS-EN 1504-10:2004 consists of the English text of the European standard EN 1504-10:2003 + AC:2005.</p> <p>This document is endorsed on 18.05.2004 with the notification being published in the official publication of the Estonian national standardisation organisation.</p> <p>The standard is available from Estonian standardisation organisation.</p>
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<p>Käsitlusala:</p> <p>This European Standard gives requirements for substrate condition before and during application including structure stability, storage, the preparation and application of products and systems for the protection and repair of concrete structures including quality control, maintenance, health and safety, and the environment.</p>	<p>Scope:</p> <p>This European Standard gives requirements for substrate condition before and during application including structure stability, storage, the preparation and application of products and systems for the protection and repair of concrete structures including quality control, maintenance, health and safety, and the environment.</p>
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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 10: Site application of products and systems and quality control of the works

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 10: Application sur site des produits et systèmes et contrôle de la qualité des travaux

Produkte und Systeme für den Schutz und die Instandsetzung von Betontragwerken - Definitionen, Anforderungen, Qualitätsüberwachung und Beurteilung der Konformität - Teil 10: Anwendung von Produkten und Systemen auf der Baustelle, Qualitätsüberwachung der Ausführung

This European Standard was approved by CEN on 28 February 2003.

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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 Central Secretariat 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, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
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Contents

Page

1	Scope	6
2	Normative references	6
3	Terms and definitions	9
4	Structural stability during preparation, protection and repair	12
5	General requirements	12
6	Methods of protection and repair	12
7	Preparation of substrate	21
7.1	General	21
7.2	Preparation of concrete	23
7.2.1	General	23
7.2.2	Cleaning	23
7.2.3	Roughening	23
7.2.4	Concrete removal	23
7.3	Preparation of reinforcement	24
7.3.1	General	24
7.3.2	Cleaning	24
8	Application of products and systems	24
8.1	General	24
8.2	Defects in concrete and structural strengthening	28
8.2.1	Bonding	28
8.2.2	Hand applied mortar and concrete	28
8.2.3	Sprayed mortar or concrete	28
8.2.4	Cast mortar or concrete	28
8.2.5	Curing	29
8.2.6	Cracks and joints	29
8.2.7	Surface coatings and other treatments	29
8.2.8	Anchoring	30
8.2.9	Plate bonding	30
8.3	Defects caused by reinforcement corrosion	30
8.3.1	Coating reinforcement	30
8.3.2	Removal	30
8.3.3	Replacement	31
9	Quality control	31
9.1	General	31
9.2	Quality control tests and observations	31
10	Maintenance	42
11	Health, safety and the environment	42
Annex A (informative)		43
Foreword		43
A.2	Informative references	43
A.3	Definitions	43
A.4	Structural stability during preparation, protection and repair	44
A.5	General requirements	44
A.6	Methods of protection and repair	44
A.7	Preparation of substrate	46
A.7.2.1	General	46
A.7.2.2	Cleaning	47
A.7.2.3	Roughening	47
A.7.2.4	Concrete removal	47

A.7.3.1 General.....	49
A.7.3.2 Cleaning.....	49
A.8 Application of products and systems.....	49
A.8.1 General.....	49
A.8.2.1 Bonding	49
A.8.2.2 Hand applied mortar or concrete	50
A.8.2.3 Sprayed concrete and mortar.....	50
A.8.2.4 Cast mortar or concrete	50
A.8.2.5 Curing	50
A.8.2.6 Cracks and joints.....	51
A.8.2.7 Surface coatings and other treatments.....	51
A.8.2.9 Plate bonding	52
A.8.3.1 Coating reinforcement.....	52
A.8.3.2 and A.8.3.3 Removal and replacement	52
A.9 Quality control.....	52
A.9.1 General.....	52
A.9.2 Quality control tests and observations	53
A.11 Health, safety and the environment.....	61

Foreword

This document (EN 1504-10:2003) 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 June 2004, and conflicting national standards shall be withdrawn at the latest by June 2004.

This document is part of the series of European standards EN 1504 "Products and systems for the protection and repair of concrete structures". The other parts of the standard are given in clause 2 – Normative references.

This European Standard shall be given the status of National Standard, either by the publication of an identical text or by endorsement.

This European standard specifies requirements for the execution of protection and repair of concrete structures.

It has been prepared by CEN/TC 104, Subcommittee 8 "Products and systems for the protection and repair of concrete structures", the secretariat of which is held by AFNOR.

Annex A is informative.

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, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and the United Kingdom.

Introduction

This standard is part of the EN 1504 series of European standards which define and specify products and systems for the protection and repair of concrete structures. This Standard defines and specifies site application of these products and systems and quality control of the works.

The execution of this work is an important and integral part of the complex process of protection and repair, and this Standard specifies how it shall be carried out. The Specifications in this Standard are part of the definition of the intended use for the relevant products and systems. The execution shall be in accordance with this series of standards, ENV 13670-1, EN 1990, ENV 1992-2-4, EN 206-1 and any other relevant EN and European Technical Approval.

The specification for products and systems for protection and repair of concrete structures are given in Parts 2 - 7 of this standard. They can only be satisfied if the rules given in part 9 of this standard and this part of the standard are followed.

This standard contains an Annex A which provides guidance and background information to the normative text. The contents of the Annex A are numbered in the same way as the normative text to facilitate reference, but prefixed with "A".

1 Scope

This part of EN 1504 gives requirements for substrate condition before and during application including structural stability, storage, the preparation and application of products and systems for the protection and repair of concrete structures including quality control, maintenance, health and safety, and the environment.

2 Normative references

This part of 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.

EN 206-1, *Concrete – Part 1: Specification, performance, production and conformity*.

EN 1008, *Mixing water for concrete – Specification for sampling, testing and assessing the suitability of water, including water recovered from processes in the concrete industry, as mixing water for concrete*.

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 1504-2:2000-03, *Products and systems for the protection and repair of concrete structures - Definitions, requirements, quality control and evaluation of conformity - Part 2: Surface protection systems*.

prEN 1504-3:2001-03, *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 1504-4:2000-04, *Products and systems for the protection and repair of concrete structures - Definitions, requirements, quality control and evaluation of conformity - Part 4: Structural bonding*.

prEN 1504-5:2002-01, *Products and systems for the protection and repair of concrete structures - Definitions, requirements, quality control and evaluation of conformity - Part 5: Concrete injection*.

prEN 1504-6:2001-12, *Products and systems for the protection and repair of concrete structures - Part 6: Grouting to anchor reinforcement or to fill external voids*.

prEN 1504-7¹⁾, *Products and systems for the protection and repair of concrete structures - Definitions, requirements, quality control, evaluation of conformity - Part 7: Reinforcement corrosion prevention*.

prEN 1504-8:2000-10, *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 1542, *Products and systems for the protection and repair of concrete structures - Test methods - Measurement of bond strength by pull-off*.

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

prEN 1881:2003-06, *Products and systems for the protection and repair of concrete structures - Test methods - Pull-out test of rebar from concrete*.

1) currently under preparation

EN 1990:2002, *Eurocode - Basis of structural design.*

ENV 1992-2:1996, *Eurocode 2: Design of concrete structures – Part 2: Concrete bridge.*

ENV 1992-3:1998, *Eurocode 2: Design of concrete structures – Part 3: Concrete foundations.*

ENV 1992-4:2000, *Eurocode 2: Design of concrete structures – Part 4: Liquid retaining and containment structures.*

prEN 10080–1:1999-07, *Steel for reinforcement of concrete - Weldable reinforcing steel - Part 1: General requirements.*

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

EN 12350-1, *Testing fresh concrete - Part 1: Sampling.*

EN 12350-2, *Testing fresh concrete - Part 2: Slump test.*

EN 12350-3, *Testing fresh concrete - Part 3: Vebe test.*

EN 12350-4, *Testing fresh concrete - Part 4: Degree of compactability.*

EN 12350-5, *Testing fresh concrete - Part 5: Flow Table test.*

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

EN 12350-7, *Testing fresh concrete - Part 7: Air Content - Pressure methods.*

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

EN 12390-2, *Testing hardened concrete – Part 2: Making and curing specimens for strength tests.*

EN 12390-3, *Testing hardened concrete - Part 3: Compressive strength of test specimens.*

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

EN 12390-8, *Testing hardened concrete - Part 8: Depth of penetration of water under pressure.*

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

EN 12504-2, *Testing concrete in structures – Part 2: Non destructive testing - determination of rebound number.*

prEN 12504-4:1998-07, *Testing concrete in structures – Part 4: Determination of ultrasonic pulse velocity.*

EN 12696, *Cathodic protection of steel in concrete.*

EN 13395-1, *Products and systems for the protection and repair of concrete structures - Test methods - Determination of workability - Part 1: Test for flow thixotropic mortars.*

EN 13395-2, *Products and systems for the protection and repair of concrete structures - Test methods - Determination of workability - Part 2: Test for flow of grout or mortar.*

EN 13395-3, *Products and systems for the protection and repair of concrete structures - Test methods - Determination of workability - Part 3: Test for flow of repair concrete.*

EN 13395-4, *Products and systems for the protection and repair of concrete structures - Test methods - Determination of workability - Part 4: Application of repair mortar overhead.*

ENV 13670-1, *Execution of concrete structures - Part 1: Common.*

PrCEN/TS 14038-1:2000-09, *Electrochemical re-alkalisation of re-inforced concrete – Part 1: Re-alkalisation.*

prEN 14038-2¹⁾, *Electrochemical re-alkalisation and chloride extraction treatments for reinforced concrete – Part 2: Chloride extraction.*

prEN 14487-1:2002-06, *Sprayed concrete – Part 1: Definitions, specifications and conformity.*

prEN 14487-2:2003, *Sprayed concrete – Part 2: Execution of structures.*

prEN 14629:2003-03, *Products and systems for the protection and repair of concrete structures – Test methods - Determination of chloride content in hardened concrete.*

prEN 14630:2003-03, *Products and systems for the protection and repair of concrete structures – Test methods - Determination of carbonation depth in hardened concrete by the phenolphthalein method.*

EN 24624, *Paint and varnishes – Pull-off test (ISO 6424:1978).*

EN ISO 2409-6, *Method for tests for paints - Part 6: Cross Cut Test.*

EN ISO 2808, *Paint and varnishes – Determination of film thickness (ISO 2808:1997).*

EN ISO 3274, *Geometrical Product Specifications (GPS) - Surface texture: Profile method - Nominal characteristics of contact (stylus) instruments (ISO 3274:1996).*

EN ISO 4288:1997, *Geometrical Product Specifications (GPS) – Surface texture: Profile Method – Rules and procedures of the assessment of surface texture (ISO 4288:1996).*

EN ISO 4628-1:2003, *Paints and varnishes - Evaluation of degradation of coatings - Designation of quantity and size of defects, and of intensity of uniform changes in appearance - Part 1: General introduction and designation system (ISO 4628-1:2003)*

EN ISO 4628-2:2003, *Paints and varnishes - Evaluation of degradation of coatings - Designation of quantity and size of defects, and of intensity of uniform changes in appearance - Part 2: Assessment of degree of blistering (ISO 4628-2:2003).*

EN ISO 4628-3:2003, *Paints and varnishes - Evaluation of degradation of coatings - Designation of quantity and size of defects, and of intensity of uniform changes in appearance - Part 3: Assessment of degree of rusting (ISO 4628-3:2003).*

EN ISO 4628-4:2003, *Paints and varnishes - Evaluation of degradation of coatings - Designation of quantity and size of defects, and of intensity of uniform changes in appearance - Part 4: Assessment of degree of cracking (ISO 4628-4:2003).*

prEN ISO 4628-5:2003-04, *Paints and varnishes – methods of tests for paints, designation of intensity, quantity and size of common types of defects – Part 5: Designation of degree of flaking.*

EN ISO 4628-6, *Paints and varnishes - Evaluation of degradation of paint coatings - Designation of intensity, quantity and size of common types of defect - Part 6: Rating of degree of chalking by tape method (ISO 4628-6:1990).*

EN ISO 8501-1, *Preparation of steel substrates before application of paints or related products - Visual assessment of surface cleanliness - Part 1: Rust grades and preparation grades of uncoated steel substrate and of steel substrate after overall removal of previous coatings (ISO 8501-1:1988).*

EN ISO 8501-1, *Supplement to Part 1, Preparation of steel substrates before application of paints or related products - Visual assessment of surface cleanliness – Informative Supplement to Part 1: Representative photographic examples of the change of appearance imparted to steel when blast-cleaned with different abrasives (ISO 8501-1:1988/Suppl:1994).*

ENV ISO 8502-1, *Preparation of steel substrates before application of paints or related products – Tests for the assessment of surface cleanliness – Part 1: Field test for soluble iron corrosion products (ISO/TR 8502-1:1991).*

EN ISO 8502-2, *Preparation of steel substrates before application of paints or related products – Tests for the assessment of surface cleanliness – Part 2: Laboratory determination of chloride on cleaned surfaces* (ISO 8502-2:1992).

EN ISO 8502-3, *Preparation of steel substrates before application of paints or related products – Tests for the assessment of surface cleanliness – Part 3: Assessment of dust on steel surfaces prepared for painting (pressure-sensitive tape method)* (ISO 8502-3:1992).

EN ISO 8502-4, *Preparation of steel substrates before application of paints or related products – Tests for the assessment of surface cleanliness – Part 4: Guidance on the estimation of the probability of condensation prior to paint application* (ISO 8502-4:1993).

ISO 4677-1, *Atmospheres for conditioning and testing - Determination of relative humidity - Part 1: Aspirated psychrometer method.*

ISO 4677-2, *Atmospheres for conditioning and testing - Determination of relative humidity - Part 2: Whirled psychrometer method.*

ISO 7031, *Concrete hardened - Determination of permeability.*

ISO 8047, *Concrete hardened - Determination of ultrasonic pulse velocity testing.*

3 Terms and definitions

For the purposes of this European Standard, the following terms and definitions apply in addition to those given in parts 1 and 9 of this standard some of which are included to assist users of this standard.

3.1

appropriate person

the freeholder and if different the person in legal occupation

3.2

bond

the adhesion of the applied product or system to the substrate

3.3

cement grout

mixture of cement, water and in some cases admixtures

3.4

cementitious repair products and systems

hydraulic or polymer hydraulic mortars, concretes and grouts

3.5

coating

treatment to produce a continuous layer on the surface of concrete. The thickness is typically 0.1 mm to 5.0 mm. Particular applications may require a thickness greater than 5.0 mm

3.6

dew point

temperature at which water vapour condenses

3.7

hydrophobic impregnation

treatment of concrete to produce a water repellent surface. The pores and capillaries are not filled, but only lined. The visual appearance remains nearly unaffected