SLOVENSKI STANDARD
oSIST prEN 1504-7:2015

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Proizvodi in sistemi za zaščito in popravilo betonskih konstrukcij - Definicije, zahteve, kontrola kakovosti in preverjanje nespremenljivosti lastnosti (AVCP) - 7. del: Zaščita armature proti koroziji

Products and systems for the protection and repair of concrete structures - Definitions, requirements, quality control and AVCP - Part 7: Reinforcement corrosion protection

Produkte und Systeme für den Schutz und die Instandsetzung von Betontragwerken - Definitionen, Anforderungen, Qualitätskontrolle und AVCP - Teil 7: Korrosionsschutz der Bewehrung

Produits et systèmes pour la protection et la réparation des structures en béton - Définitions, exigences, maîtrise de la qualité et EVCP - Partie 7 : Protection contre la corrosion des armatures

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Products and systems for the protection and repair of concrete structures - Definitions, requirements, quality control and AVCP - Part 7: Reinforcement corrosion protection

Produits et systèmes pour la protection et la réparation de structures en béton - Définitions prescriptions, maîtrise de la qualité et EVCP - Partie 7 : Protection contre la corrosion des armatures

Produkte und Systeme für den Schutz und die Instandsetzung von Betontragwerken - Definitionen, Anforderungen, Qualitätsueberwachung und AVCP - Teil 7: Korrosionsschutz der Bewehrung

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 104.

If this draft becomes a European Standard, 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.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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

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European foreword

This document (prEN 1504-7:2015) has been prepared by Technical Committee CEN/TC 104 “Concrete and related products”, the secretariat of which is held by DIN.

This document is currently submitted to the CEN Enquiry.

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 Regulation (EU) No. 305/2011.

For relationship with Regulation (EU) No. 305/2011, see informative Annex ZA which is an integral part of this document.

EN 1504-7 includes an informative Annex A, dealing with minimum frequency of testing for factory production control.

This document will supersede EN 1504-7:2006.

The main changes compared to the previous edition are:

a) clarification of the scope;

b) in Table 3, addressing of testing the system of corrosion protection coating and repair mortar according to prEN 1504-3:2015, if necessary;

c) revision of Annex ZA according to the CPR.

EN 1504, *Products and systems for the protection and repair of concrete structures — Definitions, requirements, quality control and AVCP,* consists of the following parts:

— *Part 1: Definitions*

— *Part 2: Surface protection products and systems for concrete*

— *Part 3: Repair concrete and mortars*

— *Part 4: Structural bonding*

— *Part 5: Concrete injection*

— *Part 6: Anchoring of reinforcing steel bar*

— *Part 7: Reinforcement corrosion protection* (the present document)

— *Part 8: Quality control and assessment and verification of the constancy of performance (AVCP)*

— *Part 9: General principles for the use of products and systems*

— *Part 10: Site application of products and systems and quality control of the works*

1 Scope

This part of EN 1504 specifies requirements for the identification and the performance (including durability aspects) of products and systems for active and barrier coatings for protection of exposed steel which is to be embedded in repair materials according to EN 1504-3.

This part of EN 1504 does not cover products for corrosion protection of pre-stressing steels and stainless steels.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 1015-4, *Methods of test for mortar for masonry - Part 4: Determination of consistence of fresh mortar (by plunger penetration)*

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 1504-8:2004, *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 1504-9:2008, *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 1767, *Products and systems for the protection and repair of concrete structures - Test methods - Infrared analysis*

EN 1877-1, *Products and systems for the protection and repair of concrete structures - Test methods - Reactive functions related to epoxy resins - Part 1: Determination of epoxy equivalent*

EN 1877-2, *Products and systems for the protection and repair of concrete structures - Test methods - Reactive functions related to epoxy resins - Part 2: Determination of amine functions using the total basicity number*

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

EN 13062, *Products and systems for the protection and repair of concrete structure - Test method - Determination of thixotropy of products for protection of reinforcement*

EN 15183, *Products and systems for the protection and repair of concrete structures - Test methods - Corrosion protection test*

EN 15184, *Products and systems for the protection and repair of concrete structures - Test methods - Shear adhesion of coated steel to concrete (pull-out test)*

EN ISO 868, *Plastics and ebonite - Determination of indentation hardness by means of a durometer (Shore hardness) (ISO 868)*

EN ISO 2811-1, *Paints and varnishes - Determination of density - Part 1: Pyknometer method (ISO 2811-1)*

EN ISO 2811-2, *Paints and varnishes - Determination of density - Part 2: Immersed body (plummet) method (ISO 2811-2)*

EN ISO 3219, *Plastics - Polymers/resins in the liquid state or as emulsions or dispersions - Determination of viscosity using a rotational viscometer with defined shear rate (ISO 3219)*

EN ISO 3251, *Paints, varnishes and plastics - Determination of non-volatile-matter content (ISO 3251)*

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

EN ISO 11358-1, *Plastics - Thermogravimetry (TG) of polymers – Part 1: General principles (ISO 11358)*

3 Terms and definitions

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

3.1
coating
thin layer not exceeding 5 mm applied by brush or by mechanical means on the exposed surface of the reinforcement bars

3.2
active coating

coating, which contains electrochemically active pigments, which may function as inhibitors or which may provide localised cathodic protection

Note 1 to entry: Cement is considered to be an active pigment due to its alkalinity.

3.3
barrier coating
coating which isolates the reinforcement from pore water in the surrounding cementitious matrix

4 Performance characteristics for intended uses

Table 1 lists the performance characteristics of reinforcement corrosion protection products and systems, which are required for “all intended" uses or “for certain intended" uses according to the principles and methods defined in EN 1504-9.

Performance characteristics which are required for “all intended" uses are marked with ■. All other performance characteristics which are marked with 1 may be required for “certain intended" uses.

Performance requirements are given in 5.2.

Table 1 — Performance characteristics for "all intended" and "certain intended" uses

Test methods according to	Performance characteristics	Intended uses	
		Active coating 11.1[a]	Barrier coating 11.2[a]
EN 15183	Corrosion protection	■	■
EN 12614	Glass transition temperature	1	1
EN 15184	Shear adhesion (coated steel to concrete)	1	■
[a] Method according to EN 1504-9.			

5 Requirements

5.1 Identification requirements

The manufacturer shall undertake selected representative initial identification tests for the product or system as specified in Table 2. These tests may be used to confirm the composition of the product at any time. Acceptable tolerances are also given in Table 2. The manufacturer shall hold the test records.

Table 2 — Identification requirements and test methods

Property	Requirement / Tolerance	Test method
Components (liquid)		
Colour / General appearance	Uniform and similar to the description provided by the manufacturer	Visual
Density — Pyknometer method — Immersed body method	± 3 % ± 3 %	EN ISO 2811-1 EN ISO 2811-2
Infrared spectrum	Confirmed by visual comparison	EN 1767
Epoxy equivalent[a]	± 5 %	EN 1877-1
Amine functions[a]	± 6 %	EN 1877-2
Volatile and non-volatile matter	± 5 %	EN ISO 3251
Thermogravimetric analysis	Confirmed by comparison and ± 5 % with respect to loss of mass at 600 °C	EN ISO 11358-1
Viscosity	± 20 %	EN ISO 3219
Mixture		
Pot-life[a]	± 15 %	EN ISO 9514
Consistency	± 15 %	EN 1015-4
Thixotropy	± 15 %	EN 13062
Hardness (shore D after 7 days)	± 3 units	EN ISO 868
[a] Only for epoxy (EP).		

5.2 Performance requirements

The manufacturer shall undertake initial performance tests on corrosion protection products in accordance with Table 3 and the product shall comply with the requirements.

Table 3 — Performance requirements

Performance characteristic	Requirement	Test method
Corrosion protection	The test is considered to have been passed if the coated zones of the steels are free of corrosion and if rust creep at the ground plate edge < 1 mm.	EN 15183
Glass transition temperature	At least 10 K above maximum service temperature.	EN 12614
Shear adhesion (coated steel to concrete)	Assessment criterion is the bond stress at a displacement of Δ = 0,1 mm. The test is considered to have been passed if the bond stress determined with the coated bars is in each case at least 80 % of the reference bond stress determined for the uncoated bars.	EN 15184

Compatibility between sprayed repair system and applied reinforcement corrosion protections shall be verified especially in the case of using dry sprayed application.

The manufacturer shall clearly indicate in the product documentation (e.g. product data sheet) the minimum thickness to which the performance characteristics defined in the Table 1 were tested according to EN 15183 and EN 15184.

5.3 Dangerous substances

National regulations on dangerous substances may require verification and declaration on release, and sometimes content, when construction products covered by this standard are placed on those markets.

In the absence of European harmonized test methods, verification and declaration on release/content should be done taking into account national provisions in the place of use.

NOTE An informative database covering European and national provisions on dangerous substances is available at the Construction web site on EUROPA accessed through: http://ec.europa.eu/enterprise/construction/cpd-ds/.

6 Sampling

General requirements for sampling are set out in EN 1504-8.

7 Assessment and verification of constancy of performance - AVCP

7.1 General

General requirements for procedures for AVCP are set out in EN 1504-8.

7.2 Initial type testing

General requirements for initial type testing are set out in EN 1504-8.

7.3 Factory production control

The manufacturer shall operate a factory production control (FPC) system to ensure that production continues to meet the identification and performance requirements set out in 5.1 and 5.2.

For FPC, the manufacturer can select representative identification or performance tests or may select other test methods. Such other FPC test methods shall be correlated to the initial identification and

performance test methods to ensure conformity of the product to the requirements of this standard. Such correlation shall be clearly documented in the FPC system.

The FPC shall be undertaken in accordance with EN 1504-8.

Guidance on the frequency of identification and performance tests for FPC is given in Annex A. Frequencies may need to be increased during initial production or following an incident of non-conformity.

Any deviation from this guidance shall be justified by documented evidence which demonstrates equivalence.

7.4 Assessment, surveillance and certification of factory production control

Provisions for the assessment, surveillance and certification of FPC are given in EN 1504-8.

8 Marking and labelling

Requirements for marking and labelling are set out in EN 1504-8.

NOTE For CE marking and labelling ZA.3 applies.