SLOVENSKI STANDARD

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Kemijski dodatki za beton, malto in injekcijsko maso - 4. del: Kemijski dodatki za injekcijsko maso za prednapete kable - Definicije, zahteve, skladnost, oznaļ evanje in obeleģevanje

Admixtures for concrete, mortar and grout - Part 4: Admixtures for grout for prestressing tendons - Definitions, requirements, conformity, marking and labelling

Zusatzmittel für Beton, Mörtel und Einpressmörtel - Teil 4: Zusatzmittel für Einpressmörtel für Spannglieder - Definitionen, Anforderungen, Konformität, Kennzeichnung und Beschriftung

Adjuvants pour béton, mortier et coulis - Partie 4: Adjuvants pour coulis pour câbles de précontrainte - Définitions, exigences, conformité, marquage et étiquetage

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This European Standard was approved by CEN on 2 May 2001.

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 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 Management Centre 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, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

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

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Contents

Foreword

This European Standard has been prepared by Technical Committee CEN/TC 104 "Concrete", 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of an identical text or by endorsement, at the latest by January 2002, and conflicting national standards shall be withdrawn at the latest by April 2003.

This European Standard supersedes EN 934-4:2000.

This European standard 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 Directive(s).

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

This standard is a part of the series EN 934 "Admixtures for concrete, mortar and grout" which additionally comprises the following parts

– Part 2: Concrete admixtures - Definitions, requirements, conformity, marking and labelling

– Part 3: Admixtures for masonry mortar - Definitions, requirements, conformity, marking and labelling

– Part 5: Admixtures for sprayed concrete - Definitions, requirements, conformity, marking and labelling

– Part 6: Sampling, conformity control and evaluation of conformity

This European Standard is used with the standards of the series EN 480 which comprises test methods for admixtures.

The annexes A and ZA are 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, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

1 Scope

This European Standard defines and specifies requirements and conformity criteria for admixtures for the use in grouts for prestressing tendons according to EN 447. It covers admixtures for use in site[1]) mixed grout only. Provisions for the use of grout admixtures are not part of this standard but are covered by EN 447.

2 Normative references

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 (including amendments).

EN 196-2, *Methods of testing cement – Part 2: Chemical analysis of cement.*

EN 196-6, *Methods of testing cement – Determination of fineness.*

EN 197-1, *Cement – Part 1: Composition, specifications and conformity criteria for common cements.*

EN 445, *Grout for prestressing tendons – Test methods.*

EN 446, *Grout for prestressing tendons – Grouting procedures.*

EN 447, *Grout for prestressing tendons – Specification for common grout.*

EN 480-6, *Admixtures for concrete, mortar and grout – Test methods – Part 6: Infrared analysis.*

EN 480-8, *Admixtures for concrete, mortar and grout – Test methods – Part 8: Determination of conventional dry material content.*

EN 480-10, *Admixtures for concrete, mortar and grout – Test methods – Part 10: Determination of water soluble*

[1]) For this standard site includes precast concrete factories.

chloride content.

EN 934-6:2001, *Admixtures for concrete, mortar and grout – Part 6: Sampling, conformity control and evaluation of conformity.*

prEN 1008:1996, *Mixing water for concrete – Specification for sampling, testing and assessing the suitability of water, including wash water from recycling installations in the concrete industry, as mixing water for concrete.*

ISO 758, *Liquid chemical products for industrial use – Determination of density at 20 °C.*

ISO 1158, *Plastics – Vinyl chloride homopolymers and copolymers – Determination of chlorine.*

ISO 4316, *Surface active agents – Determination of pH of aqueous solutions – Potentiometric method.*

3 Terms and definitions

For the purposes of this standard, the following terms and definitions apply:

3.1
admixture for grout
a material which improves the characteristics of grouts to be injected into ducts for prestressing tendons by influencing their properties such as fluidity, expansion, volume change and bleeding, individually or in combination

3.2
compliance dosage
the dosage of an admixture, quoted by the manufacturer in % by mass of cement, which will meet the requirements of this standard and which is within the recommended range of dosage

3.3
recommended range of dosage
dosages between limits, which the manufacturer recommends for the product and are expressed in % by mass of cement, based on experience on site

NOTE The use of the recommended dosage does not imply that compliance with this standard will be met over the whole range. Trial tests should be carried out with the materials to be used on site to find the dosage necessary to achieve the required result (see EN 446).

3.4
test mix
a prescribed mix of cement, water and admixture

4 Composition and preparation of test mix

4.1 Constituent materials

a) Cement type CEM I strength class 42,5 complying with EN 197-1, C_3A content 7 % to 11 % by mass calculated from chemical analysis in accordance with EN 196-2 and a specific surface of 320 m^2/kg to 400 m^2/kg determined in accordance with EN 196-6.

b) Water in accordance with prEN 1008.

c) Admixture for grout under test used at its compliance dosage.

4.2 Water/cement ratio

This shall be adjusted to provide the fluidity in 4.3 and shall not exceed 0,42.

4.3 Fluidity

The fluidity, measured in accordance with EN 445, at (20 ± 2) °C, immediately after mixing shall be as follows:

– Immersion method (40 ± 10) s
– or cone method (15 ± 3) s

4.4 Mixing

This shall be carried out mechanically, with a high shear mixer, to obtain a homogeneous grout. Any recommendations from the manufacturer of the admixture, regarding the mixing sequence, shall be followed.

5 Requirements

5.1 General

Admixtures for grout shall comply with Table 1 and the relevant requirements in EN 934-6:2001.

Test mixes shall comply with Table 2.

5.2 Release of dangerous substances

For content and release of substances from the hardened grout dangerous to health, hygiene and the environment see annex A (informative).

NOTE For requirements which lead to the CE-marking, see ZA.1

Table 1 – General requirements

No	Property	Test method	Requirements
1	Homogeneity[a]	Visual	Homogeneous when used. Segregation shall not exceed the limit stated by the manufacturer.[a]
2	Colour[a]	Visual	Uniform and similar to the description provided by the manufacturer.
3	Effective component[a]	EN 480-6[b]	IR spectra to show no significant change with respect to the effective component when compared to reference spectrum provided by the manufacturer.
4	Relative density (for liquids only)[a]	ISO 758	D ± 0,03 if D > 1,10 D ± 0,02 if $D \leq$ 1,10 where D is manufacturer's stated value
5	Conventional dry material content[a]	EN 480-8[c]	0,95 $T \leq X$ < 1,05 T for T < 20 % 0,90 $T \leq X$ < 1,10 T for $T \geq$ 20 % T is manufacturer's stated value % by mass; X is test result % by mass
6	pH value (for liquids only)[a]	ISO 4316	Manufacturer's stated value ±1 or within manufacturer's stated range.
7	Total chlorine[a] [d]	ISO 1158[e]	Either ≤ 0,10 % by mass or not above the manufacturer's stated value.
8	Water soluble chloride (Cl^-)[a]	EN 480-10	Either ≤ 0,10 % by mass[g] or not above the manufacturer's stated value.
9	Corrosion behaviour	[f]	Shall not contain any substance in quantities which could adversely affect the grout or cause corrosion of the prestressing tendons e. g. thiocyanates, sulfides.[f]

[a] Manufacturer's stated value shall be provided in writing to the user.
[b] If the method in EN 480-6 is not suitable the manufacturer shall recommend an alternative test method.
[c] If the method in EN 480-8 is not suitable the manufacturer shall recommend an alternative test method.
[d] If there is no significant difference between total chlorine content and water soluble chloride content it is permitted to determine only the water soluble chloride content in subsequent tests.
[e] The procedure in ISO 1158 shall be modified as follows:
- Increase of the sample size to 0,1 g of dry admixture;
- Use of silver nitrate and ammonium thiocyanate solutions 0,01 N.
[f] Until there is an accepted European Standard the national regulations in the place of use shall apply. when requried.
[g] Where the chloride content is ≤ 0,10 % by mass, the admixture my be described as "chloride free".

Table 2 – Requirements for test mix[a]

No	Property	Test method	Requirement
1	Fluidity 30 min after mixing	EN 445	Immersion method ≤ 80 s or cone method ≤ 25 s
2	Compressive strength	EN 445	≥ 30 MPa at 28 days
3	Bleeding	EN 445	≤ 2 % of initial volume at 3 h
4	Range of volume change at 24 h	EN 445 Cylinder method	-1 % ≤ S ≤ 5 % 0 ≤ S ≤ 5 %, when testing expanding admixtures, where S is the volume change
[a] These requirements correspond with EN 447.			

6 Sampling

Requirements for sampling are given in EN 934-6:2001.

7 Conformity control

Requirements for conformity control are given in EN 934-6:2001. The frequency of testing in connection with factory production control is given in Table 3.