

SLOVENSKI STANDARD

SIST EN 934-4:2009

01-september-2009

BUXca Yý U

SIST EN 934-4:2002

SIST EN 934-4:2002/A1:2004

? Ya]'g_]XcXUh_]nUVYhcbža Uhc]b]b^Y_W]g_c'a Ugc'!("XY. ? Ya]'g_]XcXUh_]nU
]b^Y_W]g_c'a Ugc'nUdfYXbUdYhY_UV^Y! 8 YZ]b]W]YžnU hYj Yžg_`UXbcglžcnbU Yj Ub^Y
]b^cVY^YjYj Ub^Y

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 de câble de précontrainte - Définitions, exigences, conformité, marquage et étiquetage

Ta slovenski standard je istoveten z: EN 934-4:2009

ICS:

91.100.10	Cement. Mavec. Apno. Malta	Cement. Gypsum. Lime. Mortar
91.100.30	Beton in betonski izdelki	Concrete and concrete products

SIST EN 934-4:2009

en,fr

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 934-4:2009

<https://standards.iteh.ai/catalog/standards/sist/6b96a4ca-56a1-40e9-807d-c6f675088461/sist-en-934-4-2009>

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 934-4

May 2009

ICS 91.100.30

Supersedes EN 934-4:2001

English Version

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

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

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

This European Standard was approved by CEN on 24 April 2009.

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 CEN 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 CEN Management Centre has the same status as the official versions.

CEN members are the national standards bodies of 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 United Kingdom.



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

Management Centre: Avenue Marnix 17, B-1000 Brussels

Contents

Page

Foreword.....	3
1 Scope	4
2 Normative references	4
3 Terms and definitions	4
4 Composition and preparation of test mix	5
4.1 Constituent materials	5
4.2 Water/cement ratio.....	5
4.3 Fluidity	5
4.4 Mixing.....	5
5 Requirements	5
5.1 General.....	5
5.2 Specific	5
5.3 Release of dangerous substances.....	6
6 Sampling.....	6
7 Conformity control.....	6
8 Evaluation of conformity.....	7
9 Marking and labelling	7
9.1 General.....	7
9.2 Designation of admixtures.....	7
9.3 Additional Information	8
Annex A (informative) Content and release of dangerous substances.....	9
Annex B (normative) Bleed and Volume Change test.....	10
B.1 Principle	10
B.2 Apparatus	10
B.3 Procedure	10
B.4 Reporting results	10
B.4.1 Bleeding.....	10
B.4.2 Volume change	11
Annex ZA (informative) Provisions for the CE marking of admixtures for concrete under the EU Construction Products Directive.....	12
ZA.1 Clauses of this European Standard addressing the provisions of the EU Construction Products Directive	12
ZA.2 Procedure for attestation of conformity of admixtures for grout for prestressing tendons	14
ZA.2.1 System of attestation of conformity	14
ZA.2.2 EC certification and declaration of conformity.....	15
ZA.3 CE marking and labelling.....	16
Bibliography	19

Foreword

This document (EN 934-4:2009) 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 November 2009, and conflicting national standards shall be withdrawn at the latest by November 2009.

This document supersedes EN 934-4:2001.

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 EC Directive(s).

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

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

Part 1: Common requirements

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 EN 480 series 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, 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 United Kingdom.

EN 934-4:2009 (E)

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 site¹⁾ 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

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 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 934-1:2008, *Admixtures for concrete, mortar and grout — Part 1: Common requirements*

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

3 Terms and definitions

For the purposes of this document, the terms and definitions in EN 934-1:2008 and the following apply.

3.1

admixture for grout

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

expanding grout admixture

admixture for use in grout which is intended to ensure that the initial volume of the liquid grout has not reduced after hardening

3.3

compliance dosage

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

1) For this standard site includes precast concrete factories.

3.4**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).

3.5**test mix**

prescribed mix of cement, water and admixture

4 Composition and preparation of test mix**4.1 Constituent materials**

- a) Cement type CEM I strength classes 42,5 and 52,5 complying with EN 197-1, C₃A content 7 % to 11 % by mass calculated from chemical analysis in accordance with EN 196-2 and a specific surface of 320 m²/kg to 400 m²/kg determined in accordance with EN 196-6.
- b) Water in accordance with EN 1008.
- c) Admixture for grout under test used at its compliance dosage.

4.2 Water/cement ratio

(standards.iteh.ai)

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

4.3 Fluidity

<https://standards.iteh.ai/catalog/standards/sist/6b96a4ca-56a1-40e9-807d-c6f675088461/sist-en-934-4-2009>

The fluidity, measured by cone method in accordance with EN 445, at (20 ± 2) °C, immediately after mixing shall be (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 EN 934-1:2008, Table 1, Line 1 to 8 and 10.

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

5.2 Specific

Test mixes shall comply with Table 1.

EN 934-4:2009 (E)

Table 1 — Requirements for grout admixtures

No	Property	Test method	Requirements
1	Fluidity 30 min after mixing ^a	EN 445	Cone method ≤ 25 s
2	Compressive strength ^a	EN 445	≥ 30 MPa at 28 days
3	Bleeding	Annex B	≤ 2 % of initial volume at 3 h
4	Range of volume change at 24 h	Annex B	$-1 \% \leq S \leq 5 \%$ $0 \leq S \leq 5 \%$, when testing expanding admixtures, where S is the volume change
^a These requirements correspond with EN 447.			

5.3 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).

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 2.

Table 2 — Minimum frequency of test for factory production control of admixtures for grout for prestressing tendons

Tests	Frequency
Homogeneity, colour	B
Relative density (for liquids only)	B
Conventional dry material content	B
pH value (for liquids only)	B
Chloride content (Cl) ^a	4
Compressive strength	1
Fluidity	A
Bleeding	A
Volume change	A

Numbers in this table denote minimum frequency of test per year, spread according to production; if the production is less frequent every batch has to be tested.

A: means test for every 500 t with a minimum of 2 times a year

B: means test for each batch

^a Total chlorine content also has to be tested at this frequency if it is significantly different from the water soluble chloride content.

NOTE Effective component (infra red analysis) need not be included in the programme of factory production control. They shall be included in initial type testing.

(standards.iteh.ai)

8 Evaluation of conformity

SIST EN 934-4:2009

[https://standards.iteh.ai/catalog/standards/sist/6b96a4ca-56a1-40e9-807d-](https://standards.iteh.ai/catalog/standards/sist/6b96a4ca-56a1-40e9-807d-c6f675088461/sist-en-934-4-2009)

c6f675088461/sist-en-934-4-2009

Requirements for evaluation of conformity are given in EN 934-6:2001.

9 Marking and labelling

9.1 General

When admixtures for grout are supplied in containers they shall be clearly marked with the relevant information. When the material is supplied into a bulk container at the point of delivery, the same information shall be provided in writing at the time of delivery.

NOTE For CE-marking and labelling see ZA.3.

9.2 Designation of admixtures

Admixtures for concrete shall be designated by:

- Name of type of admixture in the language of one member country,
- Number of standard: EN 934-4:2009,
- Type of admixture (i.e. admixture for grout or expanding admixture for grout; EN 934-4

EXAMPLE Admixture for grout or expanding admixture for grout; EN 934-4:

EN 934-4:2009 (E)**9.3 Additional Information**

- a) batch number and production plant;
- b) summary of storage requirements including any special requirements on storage life which shall be clearly marked, e. g.: This admixture shall not be taken to comply with EN 934-4:2009 after "date";
- c) instructions for homogenisation, before use, when necessary;
- d) instructions for use and any necessary safety precautions, e. g. if caustic, toxic or corrosive;
- e) manufacturer's recommended range of dosage.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 934-4:2009

<https://standards.iteh.ai/catalog/standards/sist/6b96a4ca-56a1-40e9-807d-c6f675088461/sist-en-934-4-2009>

Annex A (informative)

Content and release of dangerous substances

In the absence of specific requirements for substances dangerous to health, hygiene and environment in this standard, the requirements of ZA.1 (paragraph "Warning") and ZA.3 apply.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 934-4:2009

<https://standards.iteh.ai/catalog/standards/sist/6b96a4ca-56a1-40e9-807d-c6f675088461/sist-en-934-4-2009>