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**Kemijski dodatki za beton, malto in injekcijsko maso - 7. del: Kemijski dodatki za zmanjšanje krčenja - Definicije, zahteve, skladnost, označevanje in etiketiranje**

Admixtures for concrete, mortar and grout - Part 7: Shrinkage reducing admixtures - Definitions, requirements, conformity, marking and labelling

Zusatzmittel für Beton, Mörtel und Einpressmörtel - Teil 7: Schwindreduzierer - Definitionen, Anforderungen, Konformität, Kennzeichnung und Beschriftung

Adjuvants pour bétons, mortier et coulis - Partie 7 : Agent réducteur de retrait - Définitions, exigences, conformité, marquage et étiquetage

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**ICS:**

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

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ICS 91.100.10; 91.100.30

English Version

## Admixtures for concrete, mortar and grout - Part 7: Shrinkage reducing admixtures - Definitions, requirements, conformity, marking and labelling

Adjuvants pour bétons, mortier et coulis - Partie 7 :  
Agent réducteur de retrait - Définitions, exigences,  
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Anforderungen, Konformität, Kennzeichnung und  
Beschriftung

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

**CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels**

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## European foreword

This document (prEN 934-7:2023) has been prepared by Technical Committee CEN/TC 104 “Concrete and related products”, the secretariat of which is held by SN.

This document is currently submitted to the CEN Enquiry.

The purpose of this document is to specify the requirements for shrinkage reducing admixtures, which are not covered by the European standard EN 934-2:2009+A1:2012.

EN 934, *Admixtures for concrete, mortar and grout*, is currently composed with the following parts:

- Part 1: *Common requirements*
- Part 2: *Admixtures for concrete, mortar and grout* — Part 2: *Concrete admixtures — Definitions, requirements, conformity, marking and labelling*
- Part 3: *Admixtures for masonry mortar — Definitions, requirements, conformity, marking and labelling*
- Part 4: *Admixtures for grout for prestressing tendons — Definitions, requirements, conformity, marking and labelling*
- Part 5: *Admixtures for sprayed concrete — Definitions, requirements, conformity, marking and labelling*
- Part 6: *Sampling, assessment and verification of the constancy of performance*
- Part 7: *Shrinkage reducing admixtures (under preparation)*

This European standard is used with the standards of the EN 480 series which comprises test methods for admixtures and standard EN 12390-16, *Testing hardened concrete — Part 16: Determination of the shrinkage of concrete*.

**prEN 934-7:2023 (E)****1 Scope**

This document specifies definitions, characteristics and requirements for shrinkage reducing admixtures for use in concrete.

It covers admixtures for plain, reinforced and prestressed concrete which are used in site mixed, ready mixed concrete and precast concrete.

The performance requirements in this document apply to admixtures used in concrete of normal consistence. They may not be applicable to admixtures intended for other types of concrete such as semi dry and earth moist mixes.

Provisions governing the practical application of admixtures in the production of concrete, i.e. requirements concerning composition, mixing, placing, curing etc. of concrete containing admixtures are not part of this document.

**2 Normative references**

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 480-1, *Admixtures for concrete, mortar and grout — Test methods — Part 1: Reference concrete and reference mortar for testing*

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

EN 934-2:2009+A1:2012, *Admixtures for concrete, mortar and grout — Part 2: Concrete admixtures — Definitions, requirements, conformity, marking and labelling*

EN 934-6:2019, *Admixtures for concrete, mortar and grout — Part 6: Sampling, assessment and verification of the constancy of performance*

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 12390-16, *Testing hardened concrete — Part 16: Determination of the shrinkage of concrete*

**3 Terms and definitions**

For the purposes of this document, the terms and definitions given in EN 934-1, EN 934-2 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <https://www.electropedia.org/>
- ISO Online browsing platform: available at <https://www.iso.org/obp>

**3.1****shrinkage reducing admixture**

admixture that, without water reduction, brings about a reduction in drying shrinkage of concrete

## 4 Requirements

### 4.1 General requirements

The requirements in this standard assume that admixtures are uniformly dispersed in concrete; special attention shall be given to the dispersion of powder admixtures with retarding effects.

The shrinkage reducing admixtures shall conform the general requirements in EN 934-1:2008, Table 1, Clause 5 and Clause 6.

### 4.2 Characteristics and requirements for shrinkage reducing admixtures

The shrinkage reducing admixtures defined in 3.1 shall comply with the characteristics and requirements listed in Table 1.

**Table 1 — Specific requirements for shrinkage reducing admixtures (at equal w/c ratio)**

No	Characteristic	Reference concrete	Assessment method	Requirements
1	Shrinkage reduction	EN 480-1 reference concrete 1	EN 12390-16	At 28 and 91 days from start of drying: Shrinkage of test mix $\leq$ shrinkage of the control mix
2	Compressive strength	EN 480-1 reference concrete 1	EN 12390-3	At 7- and 28-days test mix $\geq$ 80 % of control mix
3	Air content of fresh concrete	EN 480-1 reference concrete 1	EN 12390-7	Test mix $\leq$ 2 % above control mix

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## 5 Sampling

The sampling of admixtures shall be in accordance with EN 934-6:2019, Clause 4.

## 6 Conformity criteria

### 6.1 General

The compliance of admixtures for concrete, mortar and grout with the requirements of the relevant part of this standard shall be demonstrated by:

- determination of the product type;
- factory production control by the manufacturer, including product assessment.

The frequency of testing in connection with factory production control is given in Table 2.

**Table 2 — Minimum frequency of test for the factory production control of concrete admixtures according to prEN 934-7:2023**

No	Tests	Frequency
1	Homogeneity, colour	B
2	Relative density (for liquids only) <sup>a</sup>	B
3	Conventional dry material content <sup>a</sup>	B
4	pH value (for aqueous liquids only)	B
5	Chloride content (Cl <sup>-</sup> ) <sup>b</sup>	4
6	Alkali content	2
7	Shrinkage reduction	A
8	Compressive strength	1
9	Air content of fresh concrete	1
<p>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</p> <p>A: means test for every 1 000 t with a maximum of 3 times a year</p> <p>B: means test for each batch</p>		
<p>Effective component (infrared analysis) need not be included in the programme of factory production control. It has to be included in initial type testing.</p>		
<p><sup>a</sup> For factory production control of density and dry material content, different test methods from those specified in EN 934-1:2008, Table 1 may be used, provided a correlation between the method used and the specified method has been established.</p> <p><sup>b</sup> Total chlorine content also has to be tested at this frequency if it is significantly different from the chloride content.</p>		

The manufacturer shall always retain the overall control and shall have the necessary means to take responsibility for the conformity of the product with its declared performance(s).

Sampling, testing and compliance criteria for conformity are given in EN 934-6:2019, Clauses 4 and 5.

## 6.2 Type testing

Type testing shall be carried out to prove the conformity of the admixtures to the characteristic requirements of the relevant parts of this standard.

Type testing shall be carried out on a single sample in accordance with the characteristics, assessment method and compliance criteria (requirements) detailed in 4.1, 4.2 and Table 1 of this document.

For information on the criteria for undertaking type testing, use of historical data, and retention of test reports, see EN 934-6:2019, 5.3.



### 6.3 Factory production control

The manufacturer shall document, operate and maintain production control at each factory where admixtures are produced. Production control shall include control of raw materials, production processes and the finished product. The production control procedures shall be contained in a production control manual for each factory.

The responsibility, authority and the relationship between personnel that manages, performs or verifies work affecting product constancy, shall be defined. This applies in particular to personnel that need to initiate actions preventing product non-constancies from occurring, actions in case of non-constancies and to identify and register product constancy problems.

Personnel performing work affecting the constancy of performance of the product shall be competent on the basis of appropriate education, training, skills and experience for which records shall be maintained.

The frequency and requirements for demonstrating conformity are given in Table 2 of this document.

EN 934-6:2019 details the FPC requirements including for:

- production control manuals, 5.4.2;
- initial inspection of the factory and FPC, 5.4.4;
- continuous surveillance of FPC, 5.4.5;
- procedures for modifications, 5.4.6;
- calibration of measuring equipment, Annex A.

### 7 Attestation of conformity

The attestation of conformity of the shrinking reducing admixtures shall be according to the evaluation of conformity procedures indicated in Table 3 resulting from application of the clauses of this or other European standard indicated therein.

NOTE The terms “assessment and verification of constancy of performance (AVCP)” and “certificate of constancy of performance” are used in EN 934-6:2019 following the Commission Delegated Regulation (EU) No 568/2014. The use of these terms is not possible for admixtures covered by this document which is not a harmonized European standard.

Information concerning the procedure for certification of constancy of performance of admixtures is given in of EN 934-6:2019.

Table 3 — Assignment of evaluation of conformity tasks

Tasks		Content of the task	Clauses to apply
Tasks for the manufacturer	Factory production control (F.P.C)	Parameters related to all characteristics of Table 1 and Chloride ion content, Alkali content Corrosion behaviour (EN 934-1:2008, Tables 1, 8, 9, 10)	prEN 934-7:2023, Clause 6 (relevant tests of Table 2) EN 934-6:2019, 5.4
	Initial type testing	All characteristics of Table 1 and Chloride ion content, Alkali content, Corrosion behaviour (EN 934-1:2008, Tables 1, 8, 9, 10)	EN 934-6:2019, 5.3
	Testing of samples taken at the factory	All characteristics of Table 1 and Chloride ion content, Alkali content, Corrosion behaviour (EN 934-1:2008, Tables 1, 8, 9, 10)	EN 934-6:2019, Clause 4
Tasks for the FPC certification body	Certification of F.P.C on the basis of EN 934-6:2019	Initial inspection of factory and of F.P.C	Parameters related to all characteristics of Table 1 and Chloride ion content, Alkali content, Corrosion behaviour (EN 934-1:2008, Tables 1, 8, 9, 10)
		Continuous surveillance, assessment and approval of F.P.C.	Parameters related to all characteristics of Table 1 and Chloride ion content, Alkali content, Corrosion behaviour (EN 934-1:2008, Tables 1, 8, 9, 10)
			EN 934-6:2019, 5.5
			prEN 934-7:2023, Clause 6 (relevant tests of Table 2) EN 934-6:2019, 5.4 and 5.5

When compliance with the conditions of this clause is achieved, and once the FPC certification body has drawn up the certificate mentioned below, the manufacturer or his agent established in the EEA shall draw up and retain a declaration of conformity. This declaration shall include:

- name and address of the manufacturer, or his authorized representative established in the EEA;
- place of production;