



SLOVENSKI STANDARD
SIST EN 447:2008
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SIST EN 447:1998

Injekcijska masa za prednapete kable - Osnovne zahteve

Grout for prestressing tendons - Basic requirements

Einpressmörtel für Spannglieder - Allgemeine Anforderungen

Coulis pour câble de précontrainte - Prescriptions pour les coulis courants

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English Version

Grout for prestressing tendons - Basic requirements

Coulis pour câble de précontrainte - Prescriptions pour les
coulis courants

Einpressmörtel für Spannglieder - Allgemeine
Anforderungen

This European Standard was approved by CEN on 21 June 2007.

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.

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Contents

Page

Foreword.....	3
Introduction	4
1 Scope	6
2 Normative references	6
3 Terms and definitions	6
4 Materials	6
4.1 Cement.....	6
4.2 Water	7
4.3 Admixtures	7
4.4 Additions	7
5 Batching and mixing of grout.....	7
6 Properties of grout.....	8
6.1 General.....	8
6.2 Sieve test	8
6.3 Fluidity	8
6.4 Bleeding.....	9
6.5 Volume change	9
6.6 Strength	9
6.7 Setting time	9
6.8 Density	9
7 Evaluation of conformity.....	10
7.1 Production control.....	10
7.2 Initial type testing	10
7.3 Audit testing.....	11
Bibliography	13

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SIST EN 447:2008
<https://standards.itech.ai/catalog/standards/sist/de457e09-77d3-4d2c-89eb-10e801941183/sist-en-447-2008>

Foreword

This document (EN 447:2007) 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 April 2008, and conflicting national standards shall be withdrawn at the latest by April 2008.

This document supersedes EN 447:1996.

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.

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Introduction

In post-tensioned prestressed concrete construction, the grouting of tendons is an important operation. The intention of this European Standard is to provide basic requirements for the approval of cement grouts, compliance with which will satisfy the requirements in prEN 13670.

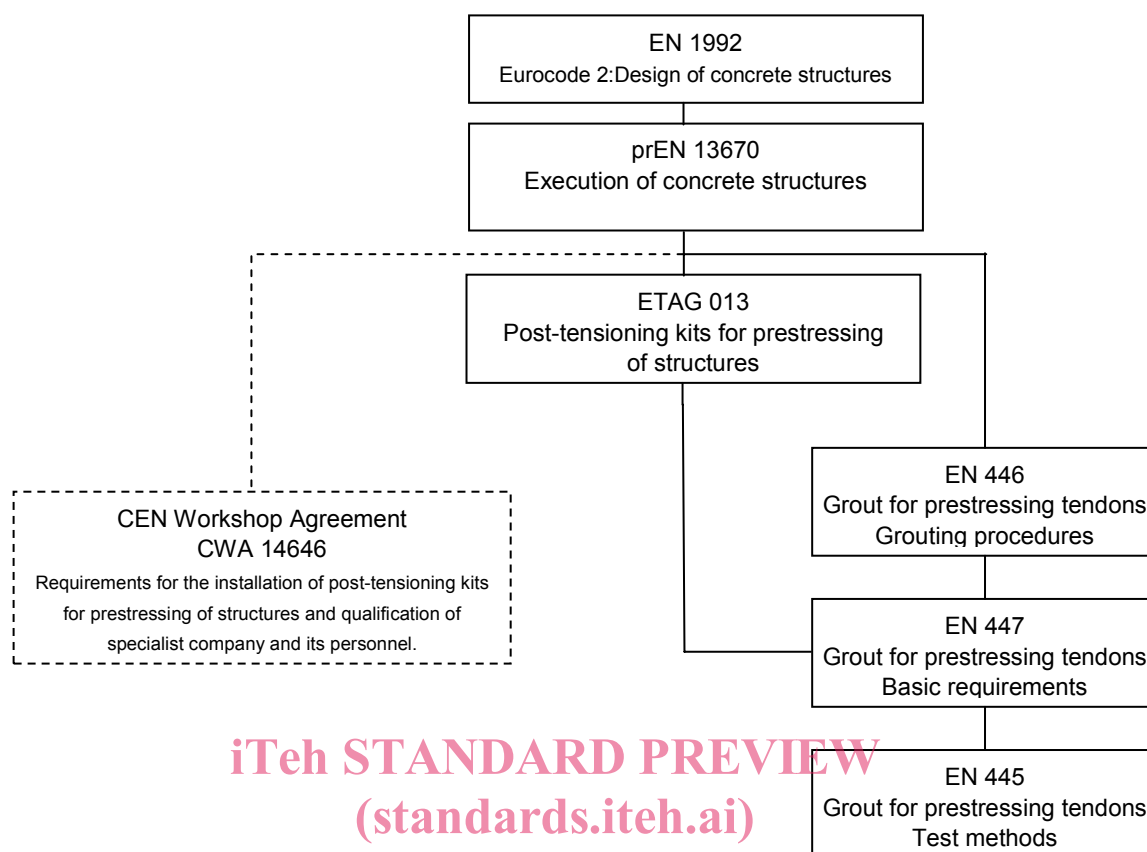
The main function of grouting is to:

- Provide protection to the prestressing steel against corrosion;
- Provide a bond between the prestressing steel and the ducts where required for the design of the structure;
- Allow transfer of compressive stresses in the structure in a direction transverse to internal tendons;
- Fill all voids where water may accumulate and cause frost damage.

The testing regimes anticipated by this European Standard include three levels:

- (1) Initial type and audit testing in accordance with this European standard;
- (2) Suitability testing for confirmation of the selected grout for a specific project in accordance with EN 446;
- (3) Inspection during grouting works on a specific project in accordance with EN 446.

The test methods for each of the regimes are given in EN 445.



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System of CEN and EOTA documents as basis for design, execution and materials selection for protective measures of prestressing systems (only main modules).

1 Scope

This European Standard covers the materials that may be used in the manufacture of cement grouts and the required properties and composition of the grout. It is applicable to grouting of tendons in all types of structures including bridges and buildings.

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 196-3, *Methods of testing cement – Part 3: Determination of setting times and soundness*

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

EN 206-1:2000, *Concrete – Part 1: Specification, performance, production and conformity*

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

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

EN 934-2, *Admixtures for concrete, mortar and grout – Part 2: Concrete admixtures - Definitions, requirements, conformity, marking and labelling*

EN 934-4, *Admixtures for concrete, mortar and grout – Part 4: Admixtures for grout for prestressing tendons – Definitions, requirements, conformity, marking and labelling*

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 13263 (all parts), *Silica fume for concrete*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1

grout

homogeneous mixture of cement and water, it may contain admixtures and additions

3.2

tendon

assembly of prestressing steel and sheath with anchorages and all necessary auxiliary components to permit grouting, either placed internally or externally to the concrete structure

4 Materials

4.1 Cement

Cement shall comply with EN 197-1 type CEM I (portland cement) or any other type of cement permitted for grouting of tendons in the place of use of the grout. The cement type shall be declared.

4.2 Water

Water shall comply with EN 1008.

4.3 Admixtures

Admixtures shall comply with EN 934-4 or EN 934-2. It shall be permissible to use admixtures singly or in combination. Admixtures shall only be used according to the admixture manufacturer's instructions.

4.4 Additions

Grout complying with this standard may contain silica fume. The silica fume shall comply with EN 13263.

If permitted in the place of use grout may contain other additions intended for the use in concrete in accordance with section 5 of EN 206-1:2000. The type and amount of additions shall be declared.

5 Batching and mixing of grout

Materials may be batched and mixed on site to fabricate grout. Alternatively, the dry materials may be batched in a factory for ready-mixed grout and mixed with the liquid materials on site to fabricate grout.

All materials shall be batched by mass except the mixing water and liquid admixtures which may be batched by mass or volume. The accuracy of batching shall be

— $\pm 2\%$ for cement, dry admixtures and additions,

— $\pm 1\%$ for water and liquid admixtures,

of the quantities specified.

Water contained in liquid admixtures shall be included in the calculation of w/c ratio.

All pozzolanic materials used as separate ingredients shall be included in the calculation of w/c ratio in accordance with the procedures in EN 206-1.

Mixing shall be carried out mechanically with suitable equipment to obtain a homogeneous and stable grout with the plastic properties given in Clause 6.

For any grout fabricated in accordance with this European standard the following information shall be declared by the grout manufacturer:

- mix proportions of materials;
- w/c ratio and its acceptable tolerance;
- sequence of introducing the materials, type of mixer and mixing time;
- range of temperature for which the grout complies with this European standard.

NOTE 1 Grouts complying with this standard will normally have a w/c ratio below 0,4.

NOTE 2 EN 446 requires suitability testing to be carried out using the same type of mixing equipment as to be used for the actual project operations. Hence, it is preferable to also use the same type of equipment for all testing as far as possible.