



SLOVENSKI STANDARD
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Injekcijska masa za prednapete kable - Preskusne metode

Grout for prestressing tendons - Test methods

Einpressmörtel für Spannglieder - Prüfverfahren

Coulis pour câble de précontrainte - Méthode d'essais

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English Version

Grout for prestressing tendons - Test methods

Coulis pour câble de précontrainte - Méthode d'essais

Einpressmörtel für Spannglieder - Prüfverfahren

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

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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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Foreword

This European Standard (EN 445:2007) 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of an identical text or by endorsement, at the latest by April 2008, and conflicting national standards shall be withdrawn at the latest by April 2008.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 445:1996.

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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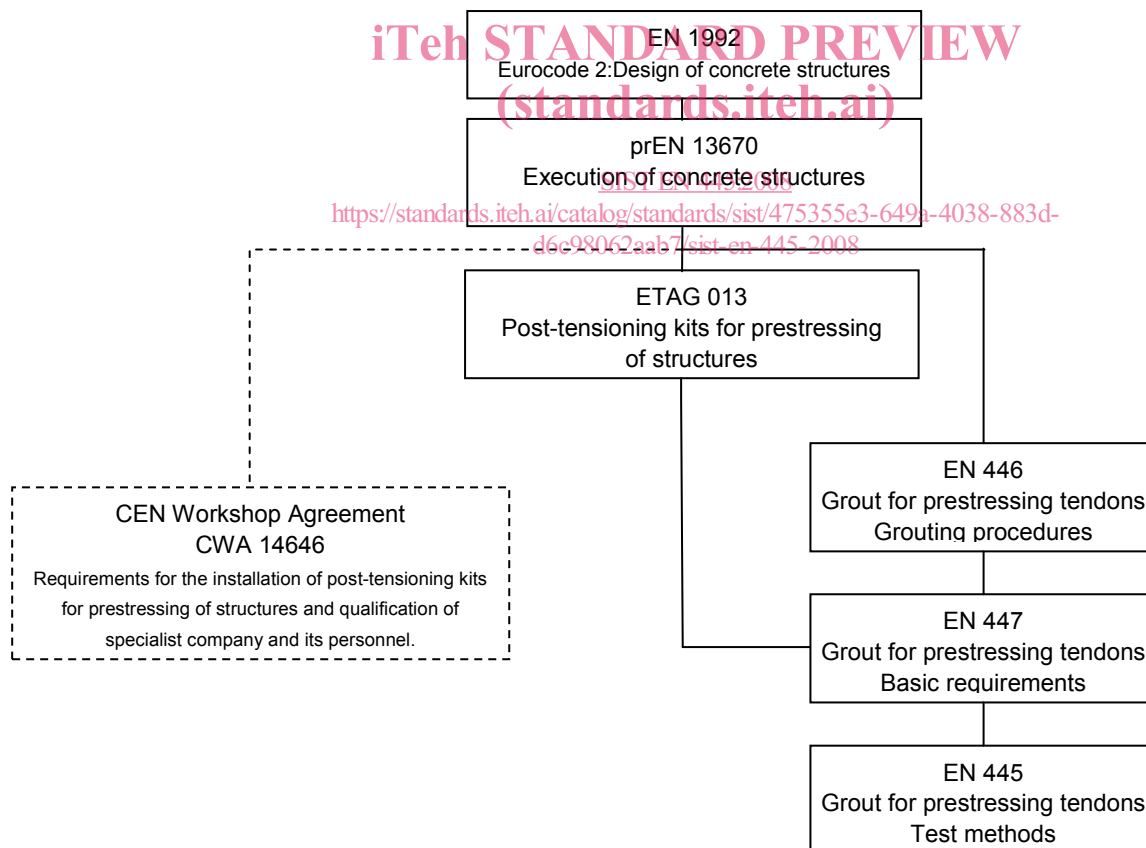
Introduction

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

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

- (1) Initial type and audit testing in accordance with EN 447;
- (2) Suitability testing for confirmation of the selected grout for a specific project in accordance with EN 446;
- (3) Inspection during the production of grout on a specific project in accordance with EN 446.

The test methods for each of the regimes are given in this standard. Some tests given herein are alternatives and it will be necessary to relate the chosen test method to the specified requirements. The tests are reference tests for checking suitability of grout for use with any type of tensile steel element.



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 describes the test methods for grout specified in EN 447. Testing shall be performed in accordance with the test methods given in this standard (reference test methods). The test methods are applicable to grout for 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 196-1, *Methods of testing cement – Determination of strength*

EN 447, *Grout for prestressing tendons – Basic Requirements*

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

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4 The testing of grout

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4.1 General

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4.1.1 Personnel

The grouts shall be tested by competent personnel experienced in the subject.

4.1.2 Test conditions

Testing shall be carried out at specified temperatures.

The grout for the tests shall be made from materials specified in EN 447 and mixed in accordance with EN 447.

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

4.1.3 Test reports

All test reports shall include the following information as a minimum:

- a) reference to this European Standard;
- b) name and address of the testing laboratory;
- c) identification number of the test report;
- d) name and address of the organisation or person who ordered the test;

- e) name and address of the manufacturer or supplier of the product(s);
- f) name or other identification mark of the product;
- g) date of fabrication, and if relevant, supply of the product;
- h) date of manufacture of test specimens;
- i) date of test;
- j) temperature of the fresh grout and ambient temperature;
- k) batching and mixing procedures used;
- l) specification of the grout mixer used;
- m) identification of test equipment used, including where appropriate, calibration details;
- n) individual results for the required test;
- o) any inaccuracies or uncertainty of test results;
- p) date and signature of the person responsible for the tests.

4.2 Sieve test

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4.2.1 Principle of test

The test consists of pouring a quantity of grout through a sieve to check for the absence of lumps on the sieve

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4.2.2 Apparatus

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A 150 mm diameter sieve with an aperture ≤ 2 mm.

4.2.3 Procedure

Pour a minimum of 1 l of freshly mixed grout through the sieve.

NOTE This may be carried out while filling the fluidity test cone.

4.2.4 Reporting

Report the absence of lumps on the sieve.

4.3 Fluidity test

NOTE Two test methods are described, only one is to be performed as appropriate for the type or characteristics of the grout.

4.3.1 Cone method

4.3.1.1 Principle of test

The fluidity of grout, expressed in seconds, is measured by the time necessary for a stated quantity of grout (1 l) to pass through the orifice of the cone, under stated conditions.

4.3.1.2 Apparatus

The following apparatus is required for the test:

- a) Cone of the dimensions given in Figure 1. The cone shall be of smooth non-absorbent material. The volume of the cone (excluding the cylindrical portions at top and bottom) shall be $(1,7 \pm 0,17)$ l.
- b) Stopwatch showing time to 0,1 s.
- c) Graduated cylinder of minimum 1 l capacity and with a diameter of approximately 60 mm.
- d) Thermometer.

NOTE The cone in Figure 1 is available in plastic.

4.3.1.3 Test procedure

4.3.1.3.1 Preparation

Mount the cone with its axis vertical and its largest diameter uppermost and support firmly in position. During the test prevent the cone from vibrating. Place the cylinder under the cone outlet. All surfaces of the cone shall be clean and shall be dampened so that the surfaces are moist but without free water. Close the lower cone orifice.

4.3.1.3.2 Procedure

Pour the grout to fill the conical section of the cone. The grout shall be poured sufficiently slowly to prevent a build-up of air. Open the lower cone orifice and at the same time start the stopwatch. Measure the time taken to the nearest 0,5 s, for 1 l of grout to run into the cylinder. The grout shall be kept agitated while waiting further testing if required.

4.3.1.4 Reporting of results

Report the time measured.