



SLOVENSKI STANDARD SIST EN 480-10:2009

01-december-2009

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Admixtures for concrete, mortar and grout - Test methods - Part 10: Determination of water soluble chloride content

Zusatzmittel für Beton, Mörtel und Einpressmörtel - Prüfverfahren - Teil 10: Bestimmung des wasserlöslichen Chloridgehaltes

Adjuvants pour béton, mortier et coulis - Méthodes d'essai - Partie 10: Détermination de la teneur en chlorure soluble dans l'eau

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Ta slovenski standard je istoveten z: EN 480-10:2009

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 480-10:2009 en,fr,de

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 480-10

July 2009

ICS 91.100.30

Supersedes EN 480-10:1996

English Version

Admixtures for concrete, mortar and grout - Test methods - Part 10: Determination of water soluble chloride content

Adjuvants pour béton, mortier et coulis - Méthodes d'essai -
Partie 10: Détermination de la teneur en chlorure soluble
dans l'eau

Zusatzmittel für Beton, Mörtel und Einpressmörtel -
Prüfverfahren - Teil 10: Bestimmung des wasserlöslichen
Chloridgehaltes

This European Standard was approved by CEN on 23 June 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.

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

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Foreword

This document (EN 480-10:2009) 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 January 2010, and conflicting national standards shall be withdrawn at the latest by January 2010.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 480-10:1996.

It has been drafted by Subcommittee 3 (SC 3) of TC 104 "Admixtures for concrete, mortar and grout".

This draft European Standard is part of the series EN 480 "Admixtures for concrete, mortar and grout – Test methods" which comprises the following:

- Part 1 *Reference concrete and reference mortar for testing*
- Part 2 *Determination of setting time*
- Part 4 *Determination of bleeding of concrete*
- Part 5 *Determination of capillary absorption*
- Part 6 *Infrared analysis*
- Part 8 *Determination of the conventional dry material content*
- Part 10 *Determination of water soluble chloride content*
- Part 11 *Determination of air void characteristics in hardened concrete*
- Part 12 *Determination of the alkali content of admixtures*
- Part 13 *Reference masonry mortar for testing mortar admixtures*
- Part 14 *Determination of the effect on corrosion susceptibility of reinforcing steel by potentiostatic electro-chemical test.*

This standard is applicable together with the other standards of the EN 480 series for testing admixtures in accordance with the EN 934 series of standards.

The following amendments have been made to the 1996-09 edition of this standard:

- editorial revision;
- detailing of used reagents;
- detailing of the procedure applied for Method 1 to Method 3.

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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 the United Kingdom.

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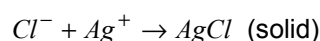
1 Scope

This draft European Standard specifies methods for determining water soluble halogens (except fluorides) in admixtures.

The total water soluble halogen content is expressed as the chloride content.

2 Principle

The object of the test is to determine the content of chloride ions (including other halogen ions except fluorides) in an admixture by precipitation of the chloride ions with a silver nitrate solution, according to the reaction:



The end point of this reaction is determined with the aid of a pH meter.

The volume of the sample required for this test has been calculated for an admixture of which the chloride content is lower than 0,1 % by mass. If the chloride content is known, or can be assumed to be higher, the admixture has to be diluted in a precise ratio before carrying out the test.

3 Apparatus

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3.1 pH meter

Either:

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- a) a pH millivoltmeter in which case the graph is plotted point by point, or
- b) a recording pH millivoltmeter connected to an automatic burette.

3.2 Electrodes

Either:

- a) a combination of two electrodes consisting of:
 - 1) an indicator: silver;
 - 2) a reference: mercuric sulphate (electrolyte KNO_3) or calomel with agar gel (electrolyte KNO_3); or
- b) a combined electrode (indicator and reference) $Ag - AgCl$ (electrolyte KNO_3).

NOTE Other electrodes such as ion selective electrodes may be used provided the results will be unaffected.

EN 480-10:2009 (E)**3.3 Additional apparatus**

3.3.1 Balance with an accuracy of 0,1 mg reading up to 200 g

3.3.2 20 ml burette graduated with accuracy of 0,05 ml

3.3.3 250 ml and 500 ml beakers

3.3.4 1 000 ml measuring flask

3.3.5 Heating device with a magnetic stirrer

3.3.6 10 ml, 20 ml and 50 ml graduated flasks

3.4 Reagents

All reagents shall be of analytical grade.

3.4.1 Concentrated nitric acid (HNO₃)

3.4.2 Hydrogen peroxide (H₂O₂), 30 % by mass (110 volumes)

3.4.3 Sodium hydroxide solution (NaOH), 33 % by mass

3.4.4 Distilled or demineralized water (standards.iteh.ai)

3.4.5 Ethanol (C₂H₅OH)

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3.4.6 Acetone (C₃H₇O)

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3.4.7 Silver nitrate solution (AgNO₃), pre-prepared 0,01 mol/l, normality N determined to ± 0,0001

4 Procedure**4.1 Preparation of sample****4.1.1 Liquid admixture**

From a liquid admixture a sample of (10 ± 1) g is weighed to 0,01 g and placed into a 250 ml or a 500 ml beaker.

4.1.2 Powder admixture

From a powder admixture a sample (5 ± 1) g is weighed to 0,01 g. The sample is placed into a 250 ml or a 500 ml beaker.

4.2 Determination**4.2.1 General**

Depending upon the composition of the admixture one of the following methods shall be used.

4.2.2 Method 1

If the admixture does not contain constituents that will interfere with the test, such as lignosulphonates, thiocyanates or reducing agents, dilute the sample or dissolve it and make the solution up to 100 ml with distilled or demineralized water. Then add 80 ml of acetone followed by dilute nitric acid until the pH is $(2,0 \pm 0,5)$ and carry out the titration of the chloride ions with the silver nitrate solution, recording the volume (V) used to 0,05 ml.

Carry out a blank titration under the same conditions and record the volume (V_0) to 0,05 ml.

4.2.3 Method 2

If the admixture does contain, or can be assumed to contain lignosulphonate or reducing agents, the sample shall be diluted or dissolved and made up to 100 ml with distilled or demineralized water. Then add 5 ml of sodium hydroxide solution followed by 10 ml of hydrogen peroxide. This can cause an exothermic reaction.

In order to avoid loss of chloride ions, make sure that the pH remains above 8,5 by adding, if necessary, more sodium hydroxide solution. Bring the solution very slowly to the boiling point by means of a heating device with a magnetic stirrer and boil for 30 minutes¹⁾.

Leave the solution to cool to (20 ± 2) °C. Then add 80 ml of acetone followed by dilute nitric acid until the pH is $(2,0 \pm 0,5)$ and carry out the titration of the chloride ions using the silver nitrate solution, recording the volume used (V) to 0,05 ml.

Carry out a blank titration under the same conditions and record the volume (V_0) to 0,05 ml.

4.2.4 Method 3

NOTE Carry out this test in an extraction cabinet to minimise the risk from the exothermic reaction and the escape of hydrogen cyanide. The operator should wear suitable protective clothing.

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If the admixture does contain, or can be assumed to contain thiocyanate, dissolve the sample if necessary and dilute to 100ml using distilled or demineralised water then place the sample in a 500 ml beaker in order to avoid losses by overflow.

Carefully add 5 ml of sodium hydroxide solution followed by 10 ml of hydrogen peroxide. This can cause an extremely exothermic reaction. After this reaction has subsided, add again 10 ml of hydrogen peroxide and repeat the addition three times. In order to avoid loss of chloride ions and minimise the escape of hydrogen cyanide, make sure that the pH remains above 8,5 at all times by adding, if necessary, more sodium hydroxide solution.

Heat the solution slowly to the boiling point and keep it boiling for 2 h. Leave the solution to cool slowly to (20 ± 2) °C. Then transfer the solution into a 250 ml beaker using distilled or demineralized water to wash out the 500 ml beaker.

Add 80 ml of acetone followed by dilute nitric acid until the pH is $(2,0 \pm 0,5)$ and carry out the titration of the chloride ions using the silver nitrate solution, recording the volume used (V) to 0,05 ml.

Carry out a blank titration under the same conditions and record the volume (V_0) to 0,05 ml

5 Results

The results shall be expressed in % by mass.

1) Some admixtures may foam while boiling. This may be reduced by the addition of ethanol.