



**SLOVENSKI STANDARD**  
**kSIST FprEN 14216:2013**

**01-oktober-2013**

---

**Cement - Sestava, zahteve in merila skladnosti za posebne cemente z zelo nizko toploto hidratacije**

Cement - Composition, specifications and conformity criteria for very low heat special cements

Zement - Zusammensetzung, Anforderungen und Konformitätskriterien von Sonderzement mit sehr niedriger Hydratationswärme

Ciments - Composition, spécifications et critères de conformité de ciments spéciaux à très faible chaleur d'hydratation

**Ta slovenski standard je istoveten z: FprEN 14216**

---

**ICS:**

91.100.10 Cement. Mavec. Apno. Malta Cement. Gypsum. Lime.  
Mortar

**kSIST FprEN 14216:2013**

**en,fr,de**



EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**FINAL DRAFT**  
**FprEN 14216**

August 2013

ICS 91.100.10

Will supersede EN 14216:2004

English Version

## Cement - Composition, specifications and conformity criteria for very low heat special cements

Ciments - Composition, spécifications et critères de  
conformité de ciments spéciaux à très faible chaleur  
d'hydratation

Zement - Zusammensetzung, Anforderungen und  
Konformitätskriterien von Sonderzement mit sehr niedriger  
Hydratationswärme

This draft European Standard is submitted to CEN members for unique acceptance procedure. It has been drawn up by the Technical Committee CEN/TC 51.

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.

This draft European Standard was established by CEN 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-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.

Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

**Warning** : This document is not a European Standard. It is distributed for review and comments. It is subject to change without notice and shall not be referred to as a European Standard.



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

**Management Centre: Avenue Marnix 17, B-1000 Brussels**

## Contents

Foreword.....	3
Introduction .....	4
1 Scope .....	5
2 Normative references .....	5
3 Terms and definitions .....	5
4 Very low heat special cement.....	5
5 Constituents .....	6
6 Composition and notation .....	6
7 Mechanical, physical, heat of hydration, chemical and durability requirements .....	8
8 Standard designation .....	10
9 Conformity criteria.....	10
<b>Annex ZA (informative) Clauses of this European Standard addressing the provisions of EU Construction Products Regulation .....</b>	<b>16</b>
<b>Bibliography .....</b>	<b>24</b>

## Foreword

This document (FprEN 14216:2013) has been prepared by Technical Committee CEN/TC 51 "Cement and building limes", the secretariat of which is held by NBN.

This document is currently submitted to the Unique Acceptance Procedure.

This document will supersede EN 14216:2004.

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 EU Directive(s).

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

This document includes a Bibliography.

The various stages in the development of a European Standard for common cement, in response to the preliminary Mandate given to CEN by the EC and the EFTA, are described in EN 197-1. It is indicated that, in view of the large numbers of different cements involved, it was considered necessary to separate the "common cements", which are now covered by EN 197-1, from special cements i.e. those with special properties or those having hardening processes not mainly dependent on the hydration of calcium silicates.

The low heat property for common cements is covered by EN 197-1.

A need for control of heat development during hydration of concrete is referred to in EN 206-1. Classification of cements with respect to heat of hydration is one method whereby heat development of concrete can be controlled. The purpose of this European Standard is therefore to specify the heat of hydration for very low heat special cements. Composition and other requirements are those specified in EN 197-1 for common cements. Conformity criteria are additionally specified.

The requirements in this European Standard are based on the results of tests on cement in accordance with EN 196, Part 1, Part 2, Part 3, Part 5, Part 7, Part 8 and Part 9. The scheme for the evaluation of conformity in EN 197-2 is applicable to very low heat special cements.

## Introduction

It is recognised that different cements have different properties and performance. Those performance tests now available (i.e. setting time, strength, soundness and heat of hydration) have been included in this European Standard. In addition, work is being carried out by CEN/TC 51 to identify any additional tests which are needed to specify further performance characteristics of cement. Until further performance tests are available it is highly recommended that the choice of cement, especially the type and/or strength class in relation to the requirements for durability depending on exposure class and type of construction in which it is incorporated, follows the appropriate standards and/or regulations for concrete valid in the place of use.

## 1 Scope

This European Standard defines and gives the specifications of six distinct very low heat special cement products and their constituents. The definition of each cement includes the proportions in which the constituents are to be combined to produce these distinct products in a single strength class having a limited heat of hydration value. The definition also includes requirements the constituents have to meet and the mechanical, physical, chemical and heat of hydration requirements for these products. This European Standard also states the conformity criteria and the related rules. Necessary durability requirements are also given.

In addition to the specified requirements, an exchange of additional information between the cement producer and user can be helpful. The procedures for such an exchange are not within the scope of this European Standard but should be dealt with in accordance with national standards or regulations or can be agreed between the parties concerned.

NOTE 1 The word "cement" in this European Standard is used to refer to very low heat special cement unless otherwise indicated.

NOTE 2 The risk of early-age thermal cracking in concrete depends upon the properties and execution and is, therefore, also dependent on factors other than the heat of hydration of the cement.

## 2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. 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 — Part 1: Determination of strength*

EN 196-2, *Methods of testing cement — Part 2: Chemical analysis of cement*

EN 196-3, *Methods of testing cement — Part 3: Determination of setting time and soundness*

EN 196-5, *Methods of testing cement — Part 5: Pozzolanicity test for pozzolanic cement*

EN 196-7, *Methods of testing cement — Part 7: Methods of taking and preparing samples of cement*

EN 196-8, *Methods of testing cement — Part 8: Heat of hydration — Solution method*

EN 196-9, *Methods of testing cement — Part 9: Heat of hydration — Semi-adiabatic method*

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

EN 197-2:2000, *Cement — Part 2: Conformity evaluation*

## 3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 197-1 apply.

## 4 Very low heat special cement

Very low heat special cement is a hydraulic binder, i.e. a finely ground inorganic material which, when mixed with water, forms a paste which sets and hardens by means of hydration reactions and processes and which,

## FprEN 14216:2013 (E)

after hardening, retains its strength and stability even under water. It has hydration reactions and processes identical to those of common cements (see EN 197-1) but through composition, fineness or reactivity of constituents the hydration process is slower.

Very low heat special cement is particularly suitable for dams and other similar massive construction, where the dimensions of the structure have a low surface/volume ratio. In this case, the dispersion of heat, developed during the hydration of the cement, is very slow and therefore it is possible to have large increases in temperature. Thermal gradients then develop between internal and external zones of the concrete setting up internal stress which can be greater than the tensile strength of the concrete and lead to cracking and breakdown. These same properties make very low heat special cement unsuitable for use in reinforced, elevated, concrete structures, e.g. bridges or buildings.

NOTE Low heat common cements or low early strength blastfurnace cements conforming to EN 197-1 are suitable for dams and other similar massive construction, depending on the design of the concrete and method of construction.

## 5 Constituents

The constituents of very low heat special cements shall conform to the requirements of the constituents of common cements specified in EN 197-1.

## 6 Composition and notation

The 6 products in the family of very low heat special cements, covered by this European Standard, and their notation are given in Table 1. They are grouped into three main cement types as follows:

- VLH III Blastfurnace cement;
- VLH IV Pozzolanic cement;
- VLH V Composite cement.

The composition of each of the 6 products in the family of very low heat special cements shall be in accordance with Table 1.

For clarity in definition, the requirements for the composition refer to the sum of all main and minor additional constituents. The final cement should be understood as the main and minor additional constituents plus the necessary calcium sulfate and any additives.