SLOVENSKI STANDARD
oSIST prEN 197-5:2020

01-september-2020

Cement - 5. del: Portlandski kompozitni cement CEM II/C-M in kompozitni cement CEM VI

Cement - Part 5: Portland-composite cement CEM II/C-M and Composite cement CEM VI

Zement - Teil 5: Portlandkompositzement CEM II/C-M und Kompositzement CEM VI

Ciment - Partie 5 : Ciment Portland composé CEM II/C-M et ciment composé CEM VI

Ta slovenski standard je istoveten z: prEN 197-5

ICS:

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

oSIST prEN 197-5:2020 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

DRAFT
prEN 197-5

June 2020

ICS 91.100.10

English Version

Cement - Part 5: Portland-composite cement CEM II/C-M and Composite cement CEM VI

Ciment - Partie 5 : Ciment Portland composé CEM II/C-M et ciment composé CEM VI

Zement - Teil 5: Portlandkompositzement CEM II/C-M und Kompositzement CEM VI

This draft European Standard is submitted to CEN members for enquiry. 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, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, 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

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

Contents

Page

European foreword

This document (prEN 197-5:2020) has been prepared by Technical Committee CEN/TC 51 “Cement and building lime”, the secretariat of which is held by NBN.

This document is currently submitted to the CEN Enquiry.

The purpose of this document is to specify the requirements for the two more recently developed cement types Portland-composite cement CEM II/C-M and Composite cement CEM VI which are not covered by the European standard EN 197-1:2011. The fitness of these cement types for the intended use to produce structural concrete has been experimentally assessed by testing programs developed in the frame of CEN/TC 51/WG 6, whose results have been included in three dossiers [1, 2, 3] approved by CEN/TC 51.

Cement types and strength classes defined in this document allow the specifier and/or the user to fulfil objectives of sustainability for cement based constructions and to minimize the use of natural resources in accordance with local conditions of production.

Introduction

It is recognized 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 document. 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 necessary 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, mortar, grout etc. valid in the place of use.

The European Committee for Standardization (CEN) draws attention to the fact that it is claimed that compliance with this document may involve the use of a patent concerning Portland limestone calcined clay cement given in Clause 4 as a possible CEM II/C-M cement and which is claimed to be relevant for the following clauses of this document: Clause 1 and Clause 4.

CEN takes no position concerning the evidence, validity and scope of this patent right.

The holder of this patent right has ensured CEN that he/she is willing to negotiate licences under reasonable and non-discriminatory terms and conditions with applicants throughout the world. In this respect, the statement of the holder of this patent right is registered with CEN. Information may be obtained from:

Aalborg Portland A/S, 9220 Aalborg Ost, Denmark.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights other than those identified above. CEN shall not be held responsible for identifying any or all such patent rights.

1 Scope

This document deals with Portland-composite cement CEM II-C/M, not covered by EN 197-1, and a new type of Composite cement CEM VI, also not covered by EN 197-1, whose intended use is the preparation of concrete, mortar, grout etc.

This document does not cover:

— common cement covered by EN 197-1;

— very low heat special cement covered by EN 14216;

— supersulfated cement covered by EN 15743;

— calcium aluminate cement covered by EN 14647;

— masonry cement covered by EN 413-1.

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 197-1:2011, *Cement — Part 1: Composition, specifications and conformity criteria for common cements*

EN 197-2:2020, *Cement — Part 2: Assessment and verification of constancy*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 197-1:2011 apply.

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

— IEC Electropedia: available at http://www.electropedia.org/

— ISO Online browsing platform: available at http://www.iso.org/obp"

4 Constituents and composition

Constituents of cement covered by this document shall fulfil the requirements specified in EN 197-1:2011, Clause 5.

However, the following requirement for limestone (L, LL) replacing EN 197-1:2011, 5.2.6 a) shall apply:

The calcium and magnesium carbonate ($CaCO_3$ and $MgCO_3$) content calculated from the sum of the calcium oxide and magnesium oxide content shall be at least 75 % by mass.

The composition of Portland-composite cement CEM II/C-M and Composite cement CEM VI covered by this document is specified in Table 1.

5 Requirements

Cement covered by this document shall fulfil the requirements specified in EN 197-1:2011, Clause 7.

In addition, Composite cement CEM VI shall conform to the requirements listed in column 4 of Table 2 and to the limit values for single results listed in column 5 of this table when tested in accordance with the standard referred to in column 2.

Table 1 — Portland-composite cement CEM II/C-M and Composite cement CEM VI

Main types	Notation of the products (types of cement)		Composition (percentage by mass [a])										
			Main constituents										Minor additional constituents
			Clinker	Blast-furnace slag	Silica fume	Pozzolana		Fly ash		Burnt shale	Limestone		
						natural	natural calcined	siliceous	calca-reous				
	Type name	Type notation	K	S	D [b]	P	Q	V	W	T	L [c]	LL [c]	
CEM II	Portland-composit	CEM II/C-M	50-64	‹---------- 36-50 ----------›									0-5
CEM VI	Composite cement	CEM VI (S-P)	35-49	31-59	–	6-20	–	–	–	–	–	–	0-5
		CEM VI (S-V)	35-49	31-59	–	–	–	6-20	–	–	–	–	0-5
		CEM VI (S-L)	35-49	31-59	–	–	–	–	–	–	6-20	–	0-5
		CEM VI (S-	35-49	31-59	–	–	–	–	–	–	–	6-20	0-5

a The values in the table refer to the sum of the main and minor additional constituents.

b The proportion of silica fume is limited to 6-10 % by mass.

c The proportion of limestone (sum of L, LL) is limited to 6-20 % by mass.

d The main constituents other than clinker shall be declared by designation of the cement (for examples, see Clause 6).

Table 2 — Additional requirements and Limit values for single results for Composite cement CEM VI

1	2	3	4	5
Property	**Test reference**	**Strength class**	**Requirements given as characteristic values [a]**	**Limit values for single results [a]**
Sulfate content (as SO_3)	EN 196-2	all	≤ 4,0	≤ 4,5
Chloride content	EN 196-2	all	≤ 0,10 [b]	≤ 0,10 [b]

a Requirements are given as percentage by mass of the final cement.

b Composite cement CEM VI may contain more than 0,10 % chloride by mass. If so, the value of 0,10 % chloride by mass shall be replaced by the upper limit for the chloride content expressed as a percentage by mass with two decimal places and this upper limit shall be stated on the packaging and/or the delivery note.

6 Standard designation

Cement covered by this document shall be designated by at least the notation of the cement type as specified in Table 1 and the Figures 32,5, 42,5 or 52,5 indicating the strength class. In order to indicate the early strength class the letter N or R shall be added as appropriate.

When in the same factory a manufacturer produces different cements complying with the same standard designation, these cements receive an additional identification in the form of a number or of two lower case letters, between brackets, in order to distinguish these cements from each other. For the numbering system, this number should be 1 for the second certified cement, 2 for the next, and so on. For the lettering system, the letters shall be chosen in such a way as to avoid confusion.

Sulfate resisting cement shall be designated additionally by the notation SR. Low heat cement shall be additionally designated by the notation LH.

EXAMPLE 1 °

Portland-composite cement CEM II/C-M containing in total a quantity of silicious fly ash (V) of between 16 % and 44 % by mass and a quantity of limestone (LL) of between 6 % and 20 % by mass and of strength class 32,5 with high early strength and a low heat of hydration and sulfate resisting is designated by:

Portland-composite cement EN 197-5 – CEM II/C-M (V-LL) 32,5 R – LH/SR

EXAMPLE 2

Portland-composite cement CEM II/C-M containing in total a quantity of granulated blast furnace slag (S) of between 6 % and 38 % by mass and a quantity of silicious fly ash (V) of between 6 % and 38 % by mass and a quantity of limestone (L) of between 6 % and 20 % by mass and of strength class 42,5 with ordinary early strength and a low heat of hydration is designated by:

Portland-composite cement EN 197-5 – CEM II/C-M (S-V-L) 42,5 N – LH

EXAMPLE 3

Composite cement CEM VI containing in total a quantity of granulated blast furnace slag (S) of between 31 % and 59 % by mass and limestone (L) of between 6 % and 20 % by mass and of strength class 32,5 with high early strength and sulfate resisting is designated by:

Composite cement EN 197-5 – CEM VI (S-L) 32,5 R – SR

EXAMPLE 4

Composite cement CEM VI containing in total a quantity of granulated blast furnace slag (S) of between 31 % and 59 % by mass and natural pozzolana (P) of between 6 % and 20 % by mass and of strength class 42,5 with ordinary early strength is designated by:

Composite cement EN 197-5 – CEM VI (S-P) 42,5 N

7 Conformity criteria

For cement covered by this document the conformity criteria specified in EN 197-1:2011, Table 2 and in Clause 9 shall apply. In particular, conformity criteria specified for “all cements” in EN 197-1:2011 shall also apply for cement covered by this document.

The conformity of cement covered by this document should be demonstrated by:

— factory production control, including product assessment, in accordance with EN 197-2:2020, Clause 4;

— assessment of the performance of the cement in accordance with EN 197-2:2020, 5.1;

— initial inspection of the manufacturing plant and of factory production control in accordance with EN 197-2:2020, 5.2;