



National Standards Authority of Ireland

STANDARD

I.S. EN 197-4:2004

ICS 91.100.10

**CEMENT - PART 4: COMPOSITION,
SPECIFICATIONS AND CONFORMITY
CRITERIA FOR LOW EARLY STRENGTH
BLASTFURNACE CEMENTS**

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EN 197-4

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English version

**Cement - Part 4: Composition, specifications and conformity
criteria for low early strength blastfurnace cements**

Ciment - Partie 4 : Composition, spécification et critères de
conformité des ciments de haut fourneau et à faible
résistance à court terme

Zement - Teil 4: Zusammensetzung, Anforderungen und
Konformitätskriterien von Hochofenzement mit niedriger
Anfangsfestigkeit

This European Standard was approved by CEN on 19 September 2003.

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 Central Secretariat 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 Central Secretariat has the same status as the official versions.

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



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Foreword

This document (EN 197-4:2004) has been prepared by Technical Committee CEN/TC 51 "Cement and building limes", the secretariat of which is held by IBN.

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of an identical text or by endorsement, at the latest by October 2004, and conflicting national standards shall be withdrawn at the latest by October 2004.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 Directive(s), see informative Annex ZA, which is an integral part of this document.

Annex A is informative.

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 additional or special properties or those having hardening processes not mainly dependent on the hydration of calcium silicates.

The strength attained at 28 days is the important criterion in classifying cement for most uses. In order to achieve a specific strength class at 28 days the early strength, at 2 days or at 7 days, can vary and some types of cement may not attain the minimum early strengths specified in EN 197-1 for common cements. The heat of hydration is linked to the early reactivity and lower early strengths indicate lower heat evolution and lower temperatures in concrete. For these cements additional precautions in use can be necessary to ensure adequate curing and safety in construction. The purpose of this EN 197-4 is to specify the composition requirements and conformity requirements for low early strength blastfurnace cements and low early strength blastfurnace cements with low heat of hydration.

The requirements in EN 197-4 are based on the results of tests on cement in accordance with EN 196 Parts 1, 2, 3, 7, 8, 9 and 21. The scheme for the evaluation of conformity of low early strength blastfurnace cements to EN 197-4 is included in EN 197-2.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

EN 197-4:2004 (E)**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 EN 197-4. 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 EN 197-4 defines and gives the specifications of 3 distinct low early strength blastfurnace 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 range of three strength classes. The definition also includes requirements the constituents have to meet and the mechanical, physical, chemical, including where appropriate, heat of hydration, requirements and strength classes. This EN 197-4 also states the conformity criteria and the related rules. Necessary durability requirements are also given.

NOTE 1 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 EN 197-4 but should be dealt with in accordance with national standards or regulations or can be agreed between the parties concerned.

NOTE 2 The word "cement" in this EN 197-4 is used to refer only to low early strength blastfurnace cements unless otherwise indicated.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text, and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

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

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

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

EN 196-21¹⁾, *Methods of testing cement — Part 21 : Determination of the chloride, carbon dioxide and alkali content of cement.*

¹⁾ EN 196-21 is currently being incorporated into EN 196-2.

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