



SLOVENSKI STANDARD
SIST ENV 413-1:1996

01-januar-1996

Zidarski cement - 1. del: Zahteve

Masonry cement - Part 1: Specification

Putz- und Mauerbinder - Teil 1: Anforderungen

Ciment a maçonner - Partie 1: Spécification

Ta slovenski standard je istoveten z: ENV 413-1:1994

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ICS:

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

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EUROPEAN PRESTANDARD

ENV 413-1

PRÉNORME EUROPÉENNE

EUROPÄISCHE VORNORM

November 1994

ICS 91.100.10

Descriptors: Cements, masonry cements, definitions, compositions, properties, specifications, classifications, physical properties, chemical properties, conformity tests, marking

English version

Masonry cement - Part 1: Specification

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Ciment à maçonner - Partie 1: Spécification

Putz- und Mauerbinder - Teil 1: Anforderungen

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This European Prestandard (ENV) was approved by CEN on 1993-11-10 as a prospective standard for provisional application. The period of validity of this ENV is limited initially to three years. After two years the members of CEN will be requested to submit their comments, particularly on the question whether the ENV can be converted into an European Standard (EN).

CEN members are required to announce the existence of this ENV in the same way as for an EN and to make the ENV available promptly at national level in an appropriate form. It is permissible to keep conflicting national standards in force (in parallel to the ENV) until the final decision about the possible conversion of the ENV into an EN is reached.

CEN members are the national standards bodies of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

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Contents	Page
Foreword	3
0 Introduction	5
1 Scope	5
2 Normative references	5
3 Masonry cement	6
4 Composition and manufacture	7
5 Requirements	7
5.1 General	7
5.2 Notation	8
5.3 Physical requirements	8
5.4 Chemical requirements	10
5.5 Marking	11
6 Conformity criteria	12
6.1 Definitions	12
6.2 Introduction	13
6.3 Application of conformity procedures	14
6.4 General procedure for assessing conformity with the characteristic values	14
6.5 Conformity criteria and procedures	15
6.6 Limits for major defects	18
 Annex	
A (informative) Cohesivity at standard consistence	20

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SIST ENV 413-1:1996

[https://standards.iteh.ai/standards/sist/65c37083-e980-4e4e-98c4-](https://standards.iteh.ai/standards/sist/65c37083-e980-4e4e-98c4-1086d31e73e/sist-env-413-1-1996)

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Foreword

This European Prestandard has been prepared by the Technical Committee CEN/TC 51 "Cement and building limes", the secretariat of which is held by IBN.

Different sources of raw materials and different climatic conditions have led to different developments in building practices and materials and therefore to different kinds of masonry cement in different regions of Europe. The results obtained from a test programme have indicated the extent to which these differences exist. This European Prestandard has been prepared to provide a range of materials from which users of EN 998-1¹⁾, EN 998-2¹⁾ and ENV 1996-1-1 (Eurocode 6)¹⁾ can select with confidence to achieve the level of strength and durability required of masonry and rendering.

The requirements in this Part of EN 413 are, where appropriate, based on the results from tests on masonry cement in accordance with the European Standards EN 196 'Methods of testing cement'.

Thus, setting times and soundness are measured on a paste of standard consistence as defined in EN 196-3 and strength is measured on a standard mortar prepared in accordance with EN 196-1 with a fixed water/cement ratio. However, some additional tests have been found necessary and these tests are described in EN 413-2.

This European Prestandard recognises the importance of workability of mortars prepared from masonry cements and recommends a suitable level in an informative annex.

The properties of bond and durability (resistance to frost and/or chemical attack) of mortars are very important and appropriate mortar tests are being developed by CEN/TC 125 - Masonry.

According to the CEN/CENELEC Internal Regulations, the following countries are bound to announce this European Prestandard: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom.

¹⁾ At present at the draft stage.

0 Introduction

The basis for this European Prestandard has been the national standards already existing in Europe which, in accordance with the International Regulations of CEN, will eventually be replaced by a European standard. The national standards differ from each other; some of the differences relate to important principles of definition and specification of properties and composition.

CEN/TC 51 has not found it appropriate to prepare a European masonry cement standard which is a common denominator of all existing national standards. Masonry cement has to be defined and specified precisely with sufficiently stringent requirements to satisfy those who are responsible for the design and construction of buildings and other structures for maximum safety and durability.

CEN/TC 51 has, on the other hand, been aware that a precise and detailed formulation of a European standard may render it more difficult to adopt the standard in the countries where the national standards differ from it. CEN/TC 51 has made every effort to obtain a balance between an adequate and clear wording of this standard and the anticipated national difficulties of adoption.

This document is a carefully balanced compromise which has been thoroughly discussed, taking into account the need to arrive at a usable standard within a relatively short period of time.

SIST ENV 413-1:1996

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1 Scope

This European Prestandard gives the definition and composition of masonry cements as commonly used in Europe for bricklaying and blocklaying and for rendering and plastering. It specifies requirements for physical and chemical properties and also the manufacturer's autocontrol procedures to ensure conformity.

For normal applications the information given in this European Prestandard EN 998-1²⁾ and EN 998-2²⁾ is as a rule sufficient. However, in special cases, an exchange of additional information between the masonry cement producer and user may be helpful. The details of such an exchange are not within the scope of this European Prestandard but shall be dealt with in accordance with national standards or other regulations or may be agreed between the parties concerned.

NOTE: In selecting a masonry cement conforming to this European Prestandard it is necessary to comply with any relevant legal requirements in force in the country in which it is to be used.

2 Normative references

This European Prestandard 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 Prestandard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

- EN 196-1 Methods of testing cement - Part 1: Determination of strength
<https://standards.iteh.ai/catalog/standards/sist/65c37083-e980-4e4e-98c4-b0ff6d31e73e/sist-env-413-1-1996>
- 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 196-6 Methods of testing cement - Part 6: Determination of fineness
- EN 196-7 Methods of testing cement - Part 7: Methods of taking and preparing samples of cement
- EN 196-21 Methods of testing cement - Part 21: Determination of the chloride, carbon dioxide and alkali content of cement
- ENV 197-1 Cement - Composition, specification and conformity criteria - Part 1: Common cements
- EN 413-2 Masonry cement - Part 2: Test methods

²⁾ See page 3.

- EN 998-1³⁾ Specification for mortar for masonry - Part 1: Rendering and plastering mortar with inorganic binding agents
- EN 998-2³⁾ Specification of mortar for masonry - Part 2: Masonry mortar

3 Masonry cement

Masonry cement is a factory made finely powdered hydraulic binder which relies essentially upon the presence of Portland cement clinker to develop strength. When mixed with sand and water only and without the addition of further materials it produces a workable mortar suitable for use in rendering, plastering and masonry work.

NOTE: In some countries masonry cement described in this European Prestandard may be designated by the names 'Chaux Hydrauliques Artificielles' or 'Calce Eminentemente Idraulica Artificiale'. These materials, however, have to be manufactured to meet all the requirements of this European Prestandard and this has to be confirmed by marking on the packaging and in the documents associated with this product (see 5.5).

The manufacturing process and its control shall ensure that the composition of masonry cement is kept within the limits fixed in this European Prestandard. Masonry cement consists ultimately of individual small grains of different materials but they shall be statistically homogeneous in composition.

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A high degree of uniformity in all masonry cement properties shall be obtained through mass production processes, in particular, adequate grinding and homogenization. Qualified and skilled personnel and the facilities to test, evaluate and adjust product quality are indispensable for producing masonry cement in accordance with this European Prestandard.

³⁾ See page 3.

4 Composition and manufacture

Masonry cement shall consist of Portland cement clinker, inorganic material and, where appropriate, organic material, as given in table 1.

Table 1: Composition of masonry cements

Type	Content %	
	Portland cement clinker	Organic material
MC 5	≥ 25	≤ 1
MC 12,5 MC 12,5X MC 22,5X	≥ 40	

Constituents shall not promote corrosion of embedded metal such as reinforcement and wall ties or impair the properties, including behaviour in fire, of the mortar made from masonry cement.

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5 Requirements

SIST ENV 413-1:1996

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5.1 General

The physical and chemical properties of masonry cements shall be measured by the test methods described in the relevant part of EN 196 and in EN 413-2. These European Standards give alternative test methods for some properties but in the event of a dispute only the reference methods shall be used.

All requirements are specified as characteristic values. They serve to define the performance level and classification of the masonry cements, which are entitled to the designated 'MC' (masonry cement).

5.2 Notation

Classes defined on the basis of the 28 day compressive strength determined in accordance with EN 196-1 shall be those given in table 2.

Table 2: Classes of masonry cements

Type	Strength class	Air-entraining agent
MC 5	5	required
MC 12,5	12,5	required
MC 12,5X	12,5	not permitted
MC 22,5X	22,5	not permitted

5.3 Physical requirements

5.3.1 Sieve residue

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The residue on a 90 µm sieve shall be not more than 15 % when determined in accordance with EN 196-6.

SIST ENV 413-1:1996

5.3.2 Initial setting time

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The initial setting time shall be not less than 60 min when determined in accordance with EN 196-3

5.3.3 Final setting time

The final setting time shall be more than 15 h when determined in accordance with EN 196-3.

5.3.4 Soundness

The expansion shall be not more than 10 mm when determined in accordance with EN 196-3.

5.3.5 Fresh mortar requirements

Properties of fresh mortar shall be measured on a mortar of standard consistence which shall have a value of penetration of (35 ± 3) mm using the plunger apparatus (see 4.2 of EN 413-2) as the reference method. The flow table test (see 4.3 of EN 413-2) is the alternative method.

The air content when determined in accordance with 6.2 or 6.3 of EN 413-2 and the water retention in accordance with clause 5 of EN 413-2, shall have the values given in table 3.

Table 3: Fresh mortar requirements

Type	Air content % by volume	Water retention % by mass
MC 5 MC 12,5	$\geq 8 \leq 20$	$\geq 80 \leq 95$
MC 12,5X MC 22,5X	$\leq 6^1)$	
¹⁾ The control of the masonry cement manufacturing process ensures that this upper limit is not exceeded.		

NOTE 1: An air entraining agent is incorporated into the masonry cements of lower strength classes to improve their workability and durability. An upper limit is set for air content to maintain good bond strength to masonry units. Water retention limits are specified for all classes of masonry cement to provide a performance suitable for use with both high and low suction masonry units.

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NOTE 2: The measurement of the cohesivity, determined in accordance with clause 7 of EN 413-2, of a fresh mortar of standard consistence provides a useful indication of the workability (see annex A).