



SLOVENSKI STANDARD

SIST ENV 459-1:1996

01-januar-1996

Gradbeno apno - 1. del: Definicije, specifikacije in merila skladnosti

Building lime - Part 1: Definitions, specifications and conformity criteria

Baukalk - Teil 1: Definitionen, Anforderungen und Konformitätskriterien

Chaux de construction - Partie 1: Définitions, spécifications et critères de conformité

Ta slovenski standard je istoveten z: **ENV 459-1:1994**

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ICS:

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

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en

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EUROPEAN PRESTANDARD

ENV 459-1

PRÉNORME EUROPÉENNE

EUROPÄISCHE VORNORM

November 1994

ICS 91.100.10

Descriptors: Construction materials, lime, binders, materials, designation, classifications, definitions, marking, specifications, mechanical strength, composition, property, physical properties, conformity tests, defects

English version

Building lime - Part 1: Definitions, specifications and conformity criteria

Chaux de construction - Partie 1: Définitions,
spécifications et critères de conformité

Baukalk - Teil 1: Definitionen, Anforderungen
und Konformitätskriterien

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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.

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CEN

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

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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.

The European Standard EN 459 for building lime consists of the following parts:

Part 1: Definitions, specifications and conformity criteria

Part 2: Test methods

The requirements in ENV 459-1 are based on the results of tests on building lime according to EN 459-2.

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.

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0 Introduction

The preparation of a European Standard for building lime was initiated by Resolution No. 107 taken by CEN/TC 51 "Cement and building limes" in 1988.

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 building lime in different regions of Europe.

An attempt has been made to include all the different types of building lime which exist in Europe in this European Prestandard. To this end, it was necessary to establish a number of classes.

By mixing with water, building limes form a paste that improves the workability (values of flow and penetration) and water retention of mortars. In lime mortars a recrystallisation of calcium carbonate occurs (this property is called "self healing"). The carbonation of hydrates in contact with atmospheric carbon dioxide increases the strength and durability of masonry mortars containing building lime.

The previous national standards for building limes generally also formed the basis for other areas of application. The classification chosen therefore also attempts to take into consideration these circumstances as far as possible.

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1 Scope

This European Prestandard applies to building limes used as binders predominantly in mortar for masonry as well as for rendering and plastering and to limes for soil stabilisation.

It gives a general definition of the different types of building limes and their classification. It also gives requirements for their chemical, mechanical and physical properties which depend on the type of building lime and specifies the manufacturer's autocontrol procedures to ensure conformity.

Terms of delivery or other contractual conditions, normally included in documents exchanged between the supplier and the purchaser of lime, are outside the scope of this European Prestandard.

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.

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EN 196-1	Methods of testing cement - Part 1: Determination of strength
EN 196-7	Method of testing cement - Part 7: Methods of taking and preparing samples of cement
ENV 413-1	Masonry cement - Part 1: Specification
EN 459-2: 1994	Building Lime - Part 2: Test methods
ISO 2859-1: 1989	Sampling procedures for inspection by attributes - Part 1: Sampling plans indexed by acceptable quality level (AQL) for lot-by-lot inspection
ISO 3534 : 1977	Statistics - Vocabulary and symbols
ISO 3951: 1989	Sampling procedures and charts for inspection by variables for percent nonconforming

3 Definitions

For the purposes of this European Prestandard the following definitions and terms used by the building industry apply.

3.1 lime: General term that includes physical and chemical forms of different varieties under which calcium and magnesium oxide and/or hydroxide can appear.

3.2 building limes: Binders, the main constituents of which, on chemical analysis, are the oxides and hydroxides of calcium (CaO , $\text{Ca}(\text{OH})_2$), with lesser amounts of magnesium (MgO , $\text{Mg}(\text{OH})_2$), silicon (SiO_2), aluminium (Al_2O_3) and iron (Fe_2O_3).

3.3 air limes¹⁾: Limes mainly consisting of calcium oxide or hydroxide which slowly harden in air by reacting with atmospheric carbon dioxide. Generally they do not harden under water as they have no hydraulic properties.

3.4 quicklimes: Air limes mainly consisting of calcium oxide and magnesium oxide produced by calcination of limestone and/or dolomite rock. Quicklimes have an exothermic reaction when in contact with water. Quicklimes are offered in varying sizes ranging from lumps to finely ground materials.

3.5 burnt limes: Quicklimes mainly consisting of calcium oxide.

3.6 dolomitic limes: Quicklimes mainly consisting of calcium oxide and magnesium oxide.

3.7 slaked limes: Air limes mainly consisting of calcium and possibly magnesium hydroxide resulting from the controlled slaking of quicklime. Slaked limes have no exothermic reaction when in contact with water. Slaked limes are produced in the form of a dry powder or as a slurry.

3.8 hydrated calcium limes: Slaked limes mainly consisting of calcium hydroxide.

3.9 hydrated dolomitic limes: Slaked limes mainly consisting of calcium hydroxide, magnesium hydroxide and magnesium oxide.

3.10 semi-hydrated dolomitic limes: Hydrated dolomitic limes mainly consisting of calcium hydroxide and magnesium oxide.

3.11 completely hydrated dolomitic limes: Hydrated dolomitic limes mainly consisting of calcium hydroxide and magnesium hydroxide.

¹⁾ Translation of a term used in most European countries.

3.12 shell limes: Slaked limes produced by calcination of shells followed by slaking.

3.13 carbide limes: Slaked limes which are a by-product of the manufacture of acetylene from calcium carbide.

3.14 lime putties: Slaked limes mixed with water to a desired consistency, mainly consisting of calcium hydroxide with or without magnesium hydroxide.

3.15 hydraulic limes and natural hydraulic limes: Limes mainly consisting of calcium silicates, calcium aluminates and calcium hydroxide produced either by burning of argillaceous limestones and subsequent slaking and grinding and/or by mixing of suitable materials with calcium hydroxide.

They have the property of setting and hardening under water. Atmospheric carbon dioxide contributes to the hardening process. They contain at least 3 % by mass of available lime (see table 1 and 4.7 of EN 459-2: 1994).

Hydraulic limes produced by burning (below 1250 °C) of more or less argillaceous limestones with reduction to powder by slaking with or without grinding are called "Natural Hydraulic Limes" (NHL).

Limes with added suitable pozzolanic or hydraulic materials, up to 20 % by mass, are designated NHL-P.

Organic additives may be added to all HL and NHL types (see 4.4).

NOTE: In some countries some masonry cements conforming to ENV 413-1 with less than 3 % available lime may be designated by the names "Chaux Hydrauliques Artificielles" or "Calce Eminentamente Idraulica Artificiale".

4 Types of building lime

4.1 Classification

The different types of building lime are classified according to their (CaO + MgO) content or, in the case of hydraulic limes, their compressive strength as follows:

- a) Calcium Lime 90 CL 90
- b) Calcium Lime 80 CL 80
- c) Calcium Lime 70 CL 70

- | | |
|-----------------------|--------|
| d) Dolomitic Lime 85 | DL 85 |
| e) Dolomitic Lime 80 | DL 80 |
| f) Hydraulic Lime 2 | HL 2 |
| f) Hydraulic Lime 3,5 | HL 3,5 |
| g) Hydraulic Lime 5 | HL 5 |

This classification refers to minimum requirements for each class (see tables 1 and 2). Compliance with these requirements is assessed by means of statistical quality control as described in clause 5 of this European Prestandard dealing with conformity criteria.

4.2 Designation

Building limes shall be identified by the type (see 4.1).

Example 1:

Calcium Lime 90 is identified by "CL 90, ENV 459-1".

Example 2:

Hydraulic Lime 5 is identified by "HL 5, ENV 459-1".

Example 3:

Natural hydraulic lime is identified by "NHL 3,5, ENV 459-1".

4.3 Marking

Building lime complying with ENV 459-1 shall be marked on the bag if so supplied, the delivery note²⁾, the invoice²⁾ or any other accompanying documentation with the following:

- a) type of building lime;
- b) commercial form of the type of building lime (e.g. quicklime, hydrated lime);
- c) place of production;

²⁾ Without working instructions "d)" and safety instructions "f)".

- d) working instructions if necessary;
- e) gross mass (if supplied in bags);
- f) safety information according to national regulations.

4.4 Chemical requirements

The composition of the building lime shall comply with the values in table 1 when tested in accordance with EN 459-2.

All types of lime listed in table 1 may contain admixtures in small quantities. When the content exceeds 0,1 %, the actual amount and types shall be declared. The admixtures shall have no detrimental influence on the properties of mortars.

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