



SLOVENSKI STANDARD

kSIST FprEN 12518:2014

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Kemikalije, ki se uporabljajo za pripravo pitne vode - Visoko kalcijevo apno

Chemicals used for treatment of water intended for human consumption - High-calcium lime

Produkte zur Aufbereitung von Wasser für den menschlichen Gebrauch - Weißkalk

Produits chimiques pour le traitement de l'eau destinée à la consommation humaine - Chaux

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Chemicals used for treatment of water intended for human consumption - High-calcium lime

Produits chimiques pour le traitement de l'eau destinée à la consommation humaine - Chaux

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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.

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

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Foreword

This document (FprEN 12518:2013) has been prepared by Technical Committee CEN/TC 164 "Water supply", the secretariat of which is held by AFNOR.

This document is currently submitted to the Unique Acceptance Procedure.

This document will supersede EN 12518:2008.

The significant technical difference between this edition and EN 12518:2008 is the deletion of the reference to EC Directive 80/778/EEC of July, 15 1980 in order to take into account of the last Directive in force (see [1]).

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FprEN 12518:2013 (E)**Introduction**

In respect of potential adverse effects on the quality of water intended for human consumption, caused by the product covered by this European Standard:

- a) this European Standard provides no information as to whether the product may be used without restriction in any of the Member States of the EU or EFTA;
- b) it should be noted that, while awaiting the adoption of verifiable European criteria, existing national regulations concerning the use and/or the characteristics of this product remain in force.

NOTE Conformity with this European Standard does not confer or imply acceptance or approval of the product in any of the Member States of the EU or EFTA. The use of the product covered by this European Standard is subject to regulation or control by National Authorities.

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1 Scope

This European Standard is applicable to high-calcium lime used for treatment of water intended for human consumption. It describes the characteristics of high-calcium lime and specifies the requirements and the corresponding test methods for high-calcium lime. It gives information on its use in water treatment. It also determines the rules relating to safe handling and use (see Annex B).

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 12485, *Chemicals used for treatment of water intended for human consumption - Calcium carbonate, high-calcium lime, half-burnt dolomite, magnesium oxide and calcium magnesium carbonate - Test methods*

3 Description

3.1 Identification

3.1.1 General

High-calcium limes are calcium oxide, calcium hydroxide and aqueous suspension of calcium hydroxide (milk of lime).

3.1.2 Chemical names

a) Calcium oxide.

b) Calcium hydroxide.

3.1.3 Synonym or common names

a) Calcium oxide: Pulverized high-calcium lime, quicklime, lump high-calcium lime.

b) Calcium hydroxide: Hydrated high-calcium lime, calcium hydroxide - aqueous suspension (milk of lime).

3.1.4 Relative molecular mass

a) Calcium oxide: 56,08.

b) Calcium hydroxide: 74,09.

3.1.5 Empirical formula

a) Calcium oxide: CaO.

b) Calcium hydroxide: Ca(OH)₂.

3.1.6 Chemical formula

a) Calcium oxide: CaO.

b) Calcium hydroxide: Ca(OH)₂.

FprEN 12518:2013 (E)**3.1.7 CAS Registry Number ¹⁾**

- a) Calcium oxide: 1305-78-8.
- b) Calcium hydroxide: 1305-62-0.

3.1.8 EINECS reference ²⁾

- a) Calcium oxide: 215-138-9.
- b) Calcium hydroxide: 215-137-3.

3.2 Commercial forms

High-calcium lime is available in the following commercial forms:

- pulverized high calcium lime (quicklime): white powder (CaO);
- lump high-calcium lime (quicklime): white lump (CaO);
- hydrated high-calcium lime: white powder, (Ca(OH)₂);
- milk of lime: aqueous suspension of calcium hydroxide (usual content of calcium hydroxide is a mass fraction between 10 % to 40 %).

3.3 Physical properties**3.3.1 Appearance**

- a) Calcium oxide: white, lumps or powder.
- b) Calcium hydroxide: white powder.
- c) Calcium hydroxide suspension: aqueous, milky suspension.

3.3.2 Density

- a) Calcium oxide: 3,35 kg/dm³ at 20 °C.
Bulk density: 800 kg/m³ to 1 200 kg/m³ ;
- b) Calcium hydroxide: 2,24 kg/dm³ at 20 °C.
Bulk density: 300 kg/m³ to 600 kg/m³.

3.3.3 Solubility (in water)

Calcium oxide: not applicable.

Calcium hydroxide: 1,85 g/l at 0 °C
1,65 g/l at 20 °C
1,53 g/l at 30 °C

1) Chemical Abstracts Service Registry Number.

2) European Inventory of Existing Commercial Chemical Substances.

1,40 g/l at 40 °C
1,28 g/l at 50 °C
1,16 g/l at 60 °C
1,04 g/l at 70 °C
0,92 g/l at 80 °C
0,81 g/l at 90 °C
0,71 g/l at 100 °C

3.3.4 Vapour pressure

Not applicable.

3.3.5 Boiling point at 100 kPa³⁾

- a) Calcium oxide: 2 850 °C.
- b) Calcium hydroxide: Decomposes at 580 °C and forms calcium oxide and water.

3.3.6 Melting point

- a) Calcium oxide: 2 570 °C.
- b) Calcium hydroxide: Decomposes at 580 °C and forms calcium oxide and water.
- c) Calcium hydroxide suspension: freezes at 0 °C.

3.3.7 Specific heat

Not applicable.

3.3.8 Viscosity (dynamic)

For calcium hydroxide suspension: depends on concentration and particle size.

3.3.9 Critical temperature

Not applicable.

3.3.10 Critical pressure

Not applicable.

3.3.11 Physical hardness

Not applicable.

3.4 Chemical properties

Aqueous suspensions are strongly alkaline. Calcium oxide (CaO) reacts with water to form calcium hydroxide Ca(OH)₂, and with acids to form calcium salts. These reactions are highly exothermic.

3) 100 kPa = 1 bar.

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4 Purity criteria

4.1 General

This European Standard specifies the minimum purity requirements for high-calcium lime used for the treatment of water intended for human consumption. Limits are given for impurities commonly present in the product. Depending on the raw material and the manufacturing process other impurities may be present and, if so, this shall be notified to the user and when necessary to relevant authorities.

Users of this product should check the national regulations in order to clarify whether it is of appropriate purity for treatment of water intended for human consumption, taking into account raw water quality, required dosage, contents of other impurities and additives used in the product not stated in this product standard.

Limits have been given for impurities and chemical parameters where these are likely to be present in significant quantities from the current production process and raw materials. If the production process or raw materials leads to significant quantities of impurities, by-products or additives being present, this shall be notified to the user.

4.2 Composition of commercial product

The products shall conform to the requirements specified in Table 1.

Table 1 — Major constituents and grading

Parameter	Pulverized high-calcium lime			Lump high-calcium lime			Hydrated high-calcium lime			Milk of lime ^b		
	Class 1	Class 2	Class 3	Class 1	Class 2	Class 3	Class 1	Class 2	Class 3	Class 1	Class 2	Class 3
Content of water soluble CaO expressed as CaO in mass fraction in %	≥ 87 ^a	≥ 84	≥ 80	≥ 87 ^a	≥ 84	≥ 80						
Content of water-soluble Ca(OH) ₂ in dry substance expressed as Ca(OH) ₂ in mass fraction in %							≥ 92 ^a	≥ 87	≥ 83	≥ 92 ^a	≥ 87	≥ 83
Retention on sieving in mass fraction in % dry substance												
0,60 mm	≤ 0,1	≤ 0,1	≤ 0,1	not applicable			≤ 0,1	≤ 0,1	≤ 0,1	≤ 0,1	≤ 0,1	≤ 0,1
0,09 mm	≤ 7,0	≤ 7,0	≤ 7,0	not applicable			≤ 5,5	≤ 5,5	≤ 5,5	≤ 5,5	≤ 5,5	≤ 5,5

^a The user may specify a higher content of lime.

^b See A.2.3 (for solubility index).

4.3 Impurities

The products shall conform to the requirements specified in Table 2.