BS EN 16003:2011

BSI Standards Publication

Chemicals used for treatment of water intended for human consumption — Calcium magnesium carbonate

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National foreword

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The UK participation in its preparation was entrusted to Technical Committee CII/59, Chemicals for drinking water treatment.

A list of organizations represented on this committee can be obtained on request to its secretary.

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ISBN 978 0 580 68717 4

ICS 13.060.20; 71.100.80

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This British Standard was published under the authority of the Standards Policy and Strategy Committee on 31 December 2011.

Amendments issued since publication

Date	Text affected

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 16003

November 2011

ICS 71.100.80

English Version

Chemicals used for treatment of water intended for human consumption - Calcium magnesium carbonate

Produits chimiques utilisés pour le traitement de l'eau destinée à la consommation humaine - Carbonate de calcium et de magnésium

Produkte zur Aufbereitung von Wasser für den menschlichen Gebrauch - Calciummagnesiumcarbonat

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Foreword

This document (EN 16003:2011) has been prepared by Technical Committee CEN/TC 164 “Water supply”, the secretariat of which is held by AFNOR.

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of an identical text or by endorsement, at the latest by May 2012, and conflicting national standards shall be withdrawn at the latest by May 2012.

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Introduction

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

— this 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;

— 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 the 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.

1 Scope

This European Standard is applicable to calcium magnesium carbonate used for treatment of water intended for human consumption. It describes the characteristics of calcium magnesium carbonate and specifies the requirements and the corresponding test methods for calcium magnesium carbonate. It gives information on its use in water treatment.

2 Normative references

The following referenced documents are indispensable for the application 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 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*

ISO 3165, *Sampling of chemical products for industrial use — Safety in sampling*

ISO 6206, *Chemical products for industrial use — Sampling — Vocabulary*

3 Description

3.1 Identification

3.1.1 Chemical name

Calcium magnesium carbonate.

3.1.2 Synonym or common name

Dolomite.

3.1.3 Relative molecular mass

184,39.

3.1.4 Empirical formula

$CaCO_3$ $MgCO_3$.

3.1.5 Chemical formula

$CaCO_3$ $MgCO_3$.

3.1.6 CAS Registry Number [1)]

16389-88-1.

1) Chemical Abstracts Service Registry Number.

3.1.7 EINECS reference [2)]

240-440-2.

3.2 Commercial forms

Calcium magnesium carbonate is available in crushed and granular form of various particle size ranges.

3.3 Physical properties

3.3.1 Appearance

The product is a white or grey to brownish material in crushed and granular form.

3.3.2 Density

The density is from 2,2 g/cm^3 to 2,9 g/cm^3 at 20 °C.

The bulk density is from 1,2 g/cm^3 to 1,6 g/cm^3.

3.3.3 Solubility in water

The solubility of product is equal to 0,032 g/l at 10 °C.

3.3.4 Vapour pressure

Not applicable.

3.3.5 Boiling point at 100 kPa [3)]

Not applicable.

3.3.6 Melting point

Not applicable.

3.3.7 Specific heat

Not applicable.

3.3.8 Viscosity (dynamic)

Not applicable.

3.3.9 Critical temperature

Not applicable.

3.3.10 Critical pressure

Not applicable.

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2) European Inventory of Existing Commercial Chemical Substances.

3) 100 kPa = 1 bar.

3.3.11 Physical hardness

Not relevant.

3.3.12 Particle size

It varies depending on the application (see A.2.3).

3.4 Chemical properties

Calcium magnesium carbonate product reacts as an alkali when dissolved in water. With carbon dioxide and water it reacts to form calcium hydrogen carbonate and magnesium hydrogen carbonate.

4 Purity criteria

4.1 General

This European Standard specifies the minimum purity requirements for calcium magnesium carbonate 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 the relevant authorities.

NOTE 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 toxic substances where these are likely to be present in significant quantities from the current production process and raw materials. If a change in the production process or raw materials leads to significant quantities of other impurities or by-products being present, this shall be notified to the user.

4.2 Composition of commercial product

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

Table 1 — Composition of commercial product

Parameter	Content in mass fraction in %
Content of Calcium magnesium carbonate, in dry substance	≥ 95
Total content of magnesium carbonate ($MgCO_3$), in dry substance	≥ 39

4.3 Impurities and main by-product

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

Table 2 — Impurities

Impurity	Content in mass fraction in %
Content of residue not soluble in hydrochloric acid., in dry substance	≤ 3

4.4 Chemical parameters

The content of chemical parameters shall conform to the requirements specified in Table 3.

Table 3 — Chemical parameters

Parameter		Limit of product mg/kg, in dry substance
Antimony (Sb)	max.	3
Arsenic (As)	max.	3
Cadmium (Cd)	max.	2
Chromium (Cr)	max.	10
Lead (Pb)	max.	10
Mercury (Hg)	max.	0,5
Nickel (Ni)	max.	10
Selenium (Se)	max.	3
NOTE Other chemical parameters and indicator parameters are not relevant in calcium magnesium carbonate because the raw materials used in the manufacturing process are free of them. For parametric values of calcium magnesium carbonate on trace metal content in drinking water, see [3].		

5 Test methods

5.1 Sampling

Observe the general recommendations of ISO 3165 and take account of ISO 6206.

Prepare the laboratory sample(s) required by the relevant procedure described in EN 12485.

5.2 Analyses

Use the relevant methods for analysis described in EN 12485.

6 Labelling - Transportation - Storage

6.1 Means of delivery

Calcium magnesium carbonate can be delivered in bags, containers and as a bulk material.

In order that the purity of the products is not affected, the means of delivery shall not have been used previously for any different product or it shall have been specially cleaned and prepared before use.

6.2 Risk and safety labelling according to the EU Directives [4)]

At the date of the publication of this European Standard no labelling requirements apply to calcium magnesium carbonate.

4) See [4] and [6].

NOTE Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC contains a list of substances classified by the EU. Substances not listed in this regulation should be classified on the basis of their intrinsic properties according to the criteria in the Regulation by the person responsible for placing the product on the market.

6.3 Transportation regulations and labelling

At the date of the publication of this European standard, calcium magnesium carbonate products are not classified as dangerous goods.

6.4 Marking

The marking shall include the following:

— "calcium magnesium carbonate", trade name;

— net mass;

— name and address of supplier and/or manufacturer;

— the statement "this product conforms to EN 16003".

6.5 Storage

6.5.1 Long term stability

Product can be stored for unlimited period of time if kept dry.

6.5.2 Storage incompatibilities

Product shall be kept away from acids.

Annex A
(informative)

General information on calcium carbonate

A.1 Origin

A.1.1 Raw materials

Natural dolomite.

A.1.2 Manufacturing process

Calcium magnesium carbonate is manufactured by quarrying, crushing, cleaning and subsequent screening of natural dolomite.

A.2 Use

A.2.1 Function

Calcium magnesium carbonate is used for partly removal of carbon dioxide and to increase pH value and hardness in water.

A.2.2 Other properties

The sum of ($CaCO_3$ + $MgCO_3$) may also be expressed as neutralizing value according to EN 12945.

A.2.3 Form in which it is used

Calcium magnesium carbonate is used in the form of granular or crushed materials.

Table A.1 — Usual particle size range

Dimensions in millimetres

Calcium magnesium carbonate
0,5 to 1,2
0,5 to 2,5
2,0 to 4,5

If the particle size range is quoted, the content of oversize and undersize should not exceed 10 %. For the determination of the particle size range, see EN 12902.

A.2.4 Treatment dose

The quantities of Calcium magnesium carbonate to be used depend on the application.

A.2.5 Means of application

Calcium magnesium carbonate is used in filters.

A.2.6 Secondary effects

Filtration of suspended solids and removal of metals.

A.2.7 Removal of excess product

Not applicable.

A.3 Rules for safe handling and use

Not relevant.

A.4 Emergency procedures

A.4.1 First aid

Not relevant.

A.4.2 Spillage

The spillage of product should be removed mechanically.

A.4.3 Fire

The product is not combustible.

Bibliography

[1] EN 12902, *Products used for treatment of water intended for human consumption — Inorganic supporting and filtering materials — Methods of test*

[2] EN 12945, *Liming materials — Determination of neutralizing value — Titrimetric methods*

[3] 98/83/EC: Council Directive of 3 November 1998 on the quality of water intended for human consumption

[4] Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006

[5] Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC

[6] Directive 1999/45/EC of the European Parliament and of the Council of 31 May 1999 concerning the approximation of the laws, regulations and administrative provisions of the Member States relating to the classification, packaging and labelling of dangerous preparations

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