BS EN 16004:2011

BSI Standards Publication

Chemicals used for treatment of water intended for human consumption — Magnesium oxide

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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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English Version

Chemicals used for treatment of water intended for human consumption - Magnesium oxide

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

Produkte zur Aufbereitung von Wasser für den menschlichen Gebrauch - Magnesiumoxid

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Foreword

This document (EN 16004:2011) 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of an identical text or by endorsement, at the latest by May 2012, and conflicting national standards shall be withdrawn at the latest by May 2012.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 magnesium oxide used for treatment of water intended for human consumption. It describes the characteristics of magnesium oxide and specifies the requirements and the corresponding test methods for magnesium oxide. 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

Magnesium oxide.

3.1.2 Synonym or common name

Periklas/magnesia.

3.1.3 Relative molecular mass

40,31.

3.1.4 Empirical formula

MgO.

3.1.5 Chemical formula

MgO.

3.1.6 CAS Registry Number [1)]

MgO: 1309-48-4.

1) Chemical Abstracts Service Registry Number.

3.1.7 EINECS reference [2].

MgO: 215-171-9.

3.2 Commercial forms

Magnesium oxide is available in granular form of various particle size ranges.

3.3 Physical properties

3.3.1 Appearance

The product is a grey material in round granular form.

3.3.2 Density

The density is 3,6 g/cm^3 at 20 °C.

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

3.3.3 Solubility in water

The solubility of product is equal to 0,0062 g/l at 20 °C.

3.3.4 Particle size

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

3.4 Chemical properties

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

4 Purity criteria

4.1 General

This European Standard specifies the minimum purity requirements for calcium magnesium oxide 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.

2) European Inventory of Existing Commercial Chemical Substances.

4.2 Composition of commercial product

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

Table 1 — Composition of commercial product

Parameter	in mass fraction in %
Content of magnesium oxide (MgO), in dry substance	> 70
Loss of ignition (CO_2 and H_2O)	< 25

4.3 Impurities and main by-product

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

Table 2 — Impurities

Impurity		Limit in commercial product, in mass fraction in %
Content of free calcium oxide and calcium hydroxide, expressed as CaO	max.	5
Content of silicon dioxide, expressed as SiO_2	max.	2
Content of aluminium oxide, expressed as Al_2O_3	max.	1
Content of iron oxide expressed as Fe_2O_3	max.	2

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 magnesium oxide because the raw materials used in the manufacturing process are free of them. For parametric values of magnesium oxide on trace metal content in drinking water, see [1].		

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

Magnesium oxide 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 [3)]

At the date of publication of this standard, no labelling is required.

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

3) See [2] and [4].

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 publication of this standard, Magnesium oxide products are not classified as dangerous goods.

6.4 Marking

The marking shall include the following:

— "magnesium oxide", trade name and grade;

— net mass;

— name and address of supplier and/or manufacturer;

— the statement "this product conforms to EN 16004."

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 magnesium oxide

A.1 Origin

A.1.1 Raw materials

Natural periklas or industrially produced magnesium oxide.

A.1.2 Manufacturing process

Magnesium oxide is manufactured by crushing and granulating.

A.2 Use

A.2.1 Function

Magnesium oxide is used to adjust pH value and hardness in water.

A.2.2 Other properties

Magnesium oxide can also be used for neutralizing mineral acids.

A.2.3 Form in which it is used

Magnesium oxide is used in the form of granular material.

Table A.1 — Usual particle size range

Dimensions in millimetres
0,5 – 2,5
2,0 – 5,0

If the particle size range is quoted, the content of oversize and undersize should not exceed 10 %.

A.2.4 Treatment dose

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

A.2.5 Means of application

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

[2] 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

[3] 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

[4] 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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