

BS EN 12914:2012



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Products used for treatment of water intended for human consumption — Powdered perlite

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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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Supersedes EN 12914:2005

English Version

Products used for treatment of water intended for human consumption - Powdered perlite

Produits utilisés pour le traitement de l'eau destinée à la consommation humaine - Perlite en poudre

Produkte zur Aufbereitung von Wasser für den menschlichen Gebrauch - Perlit, pulverförmig

This European Standard was approved by CEN on 9 September 2012.

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Foreword

This document (EN 12914:2012) 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of an identical text or by endorsement, at the latest by April 2013, and conflicting national standards shall be withdrawn at the latest by April 2013.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 12914:2005.

The significant technical difference between this edition and EN 12914:2005 is as follows:

— Updating of 9.2 in line with current legislation.

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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 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.

1 Scope

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

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 12901:1999, *Products used for treatment of water intended for human consumption — Inorganic supporting and filtering materials — Definitions*

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

EN ISO 10058 (all parts), *Chemical analysis of magnesite and dolomite refractory products (alternative to the X-ray fluorescence method) (ISO 10058)*

3 Terms, definitions and symbols

For the purposes of this document, the terms, definitions and symbols given in EN 12901:1999 apply.

4 Description

4.1 Identification

4.1.1 Chemical name

Not applicable.

4.1.2 Synonym or common names

Perlite, expanded perlite.

4.1.3 Chemical formula

Not applicable.

4.1.4 CAS Registry number ¹⁾

Not available.

1) Chemical Abstracts Service Registry Number.

4.1.5 EINECS Reference ²⁾

Not available.

4.2 Commercial form

The product is available in white powder forms in grades differing in permeability.

5 Physical properties

5.1 Appearance

White powder.

5.2 Particle size distribution

5.2.1 Particle size

A mass fraction of at least 95 % shall have a particle size less than 1 000 µm.

NOTE Other values can be necessary for certain applications. The particle size distribution is commonly specified as a mass fraction of 95 % less than a given particle size.

The particle size distribution shall be within the manufacturer's declared values.

5.2.2 Uniformity coefficient

Not relevant.

5.2.3 Oversize and undersize particles

The proportion of oversize and undersize particles shall be within the manufacturer's declared values.

5.3 Density

The bulk density packed shall be in the range of 200 kg/m³ to 700 kg/m³.

6 Chemical properties

This European Standard specifies the minimum purity requirements for powdered perlite 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, contents of other impurities and additives used in the products 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

2) European Inventory of Existing Commercial Chemical Substances.

materials lead to significant quantities of impurities, by-products or additives being present, this shall be notified to the user.

The composition of the commercial product shall conform to Table 1.

Table 1 — Composition of commercial product

Parameter		Limit in mass fraction in% of the product
SiO ₂	min	70
Al ₂ O ₃	min	10
Na ₂ O + K ₂ O	min	5
Mass loss at 150 °C	max	5

After filling, washing and commissioning of a filter system producing drinking water, powdered perlite should not increase the concentrations of chemical parameters (see [1]).

NOTE Water extractable substances, determined in accordance with the method for powdered materials given in EN 12902, can be used to estimate the leaching of the chemicals specified in EN 12902.

7 Specific properties

The permeability shall be within 15 % of the manufacturer's declared value and the cake density shall be within 5 % of the manufacturer's declared value.

8 Test methods

8.1 Sampling

Prepare the laboratory sample(s) required by the relevant procedures described in EN 12902.

8.2 Analysis

8.2.1 Particle size distribution

The particle size distribution shall be determined in accordance with EN 12902.

8.2.2 Bulk density packed

The bulk density packed shall be determined in accordance with EN 12902.

8.2.3 Content of silica

The content of silica shall be determined in accordance with EN 12902.

8.2.4 Content of aluminium oxide

The content of Al₂O₃ shall be determined in accordance with EN ISO 10058.

8.2.5 Content of sodium and potassium oxides

The contents of Na₂O and K₂O shall be determined in accordance with EN ISO 10058.

8.2.6 Mass loss at 150 °C

The mass loss at 150 °C shall be determined using the method for water content described in EN 12902 using a temperature of (150 ± 5) °C.

8.2.7 Permeability

The permeability shall be determined in accordance with EN 12902.

8.2.8 Cake density

The cake density shall be determined in accordance with EN 12902.

9 Labelling, transportation and storage

9.1 Means of delivery

Perlite shall be delivered in bags, big bags or in bulk.

In order that the purity of the product 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.

9.2 Labelling according to the EU legislation ³⁾

Powdered perlite is not listed within Annex VI of Regulation (EC) No 1272/2008 at the date of publication of this European Standard.

The legislation [2], and its amendments for the purposes of its adaptation to technical and scientific progress 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 the marketing of the substance.

NOTE Additional national regulations could apply to the labelling of this product.

9.3 Transportation regulations and labelling

Powdered perlite is not listed under a UN Number ⁴⁾.

Powdered perlite is not classified as a dangerous product for road, rail, sea and air transportation.

9.4 Marking

The marking shall include the following:

— name "Powdered perlite", trade name and grade;

— _____

3) See [2].

4) United Nations Number.

- net mass;
- name and the address of supplier and/or manufacturer;
- statement "this product conforms to EN 12914".

9.5 Storage

9.5.1 Long term stability

The product is stable but hygroscopic. The product can be stored for one or two years if kept dry and away from volatile materials which are adsorbed on the product.

9.5.2 Storage incompatibilities

The product shall be kept away from volatile solvents, odorous products and moisture.

Annex A (informative)

General information on powdered perlite

A.1 Origin

A.1.1 Raw material

Industrial manufactured perlite is produced by mining and grinding (to particle size less than 1 mm) natural rhyolite. This product contains a mass fraction of 2 % to 5 % of water as water of crystallisation.

A.1.2 Manufacturing process

Ground rhyolite is spread into the flame of a burner. At the same time, rhyolite loses its water and fuses; the water is instantly volatilised and the expansion of this steam blows the fused rhyolite into cenospheres which are rapidly cooled out of the flame.

The next step is a careful grinding of cooled cenospheres and a selection by air stream to split the product into different grades according to permeability.

As the cooling of cenospheres is very fast, there are no crystalline products such as quartz or cristobalite, and expanded perlite remains vitreous.

A.2 Typical properties

A.2.1 Composition of commercial products

The contents on a calcined basis are generally:

- SiO₂: mass fraction of 75 %;
- Al₂O₃: mass fraction of 15 %;
- Na₂O + K₂O: mass fraction of 5 %.

A.2.2 Density

The absolute density of the product is 2,2 g/cm³.

A.3 Use

Powdered perlite is used to remove solid contaminants from water.

A.4 Hydraulic characteristics

A.4.1 Permeability

The permeability is from 1 Darcy to 5 Darcy (1 Darcy = $0,987 \times 10^{-12} \text{ m}^2$).

A.4.2 Cake density

The cake density is below $0,250 \text{ g/cm}^3$ for all products.

A.5 Rules for safe handling and use

It is advised to avoid exposure to the dust which irritates the nose and throat when inhaled.

A.6 Emergency procedures

A.6.1 First aid

In case of contact with skin there is no danger, it is recommended to wash with water.

In case of contact with eyes, it is recommended to flush with plenty of water.

In case of inhalation, it is recommended to move to fresh air.

A.6.2 Spillage

It is recommended to sweep up and to discard in a refuse container or to repackage.

A.6.3 Fire

No special precautions are necessary.

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 (REACH).

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