BS EN 12913:2012

BSI Standards Publication

Products used for treatment of water intended for human consumption — Powdered diatomaceous earth

raising standards worldwide™

National foreword

This British Standard is the UK implementation of EN 12913:2012. It supersedes BS EN 12913:2005 which is withdrawn.

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.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

ISBN 978 0 580 77574 1

ICS 13.060.20; 71.100.80

Compliance with a British Standard cannot confer immunity from legal obligations.

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 31 January 2013.

Amendments issued since publication

Date	Text affected

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 12913

November 2012

ICS 71.100.80

Supersedes EN 12913:2005

English Version

Products used for treatment of water intended for human consumption - Powdered diatomaceous earth

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

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

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

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.

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

Management Centre: Avenue Marnix 17, B-1000 Brussels

Ref. No. EN 12913:2012: E

Contents

Page

Foreword

This document (EN 12913:2012) 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 May 2013, and conflicting national standards shall be withdrawn at the latest by May 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 12913:2005.

The significant technical difference between this edition and EN 12913:2005 is as follows:

— Updating of 9.2 in line with current legislation.

According to the CEN/CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

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 diatomaceous earth used for treatment of water intended for human consumption. It describes the characteristics of powdered diatomaceous earth and specifies the requirements and the corresponding test methods for powdered diatomaceous earth and gives information on its use in water treatment. It also determines the rules relating to safe handling and use of powdered diatomaceous earth (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 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*

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

Diatomite, Kieselguhr, Diatomaceous earth, Calcined diatomite, Flux calcined diatomite.

4.1.3 Chemical formula

Not applicable.

4.1.4 CAS Registry numbers [1)]

— 61 790-53-2 Dry and ground;

— 91 053-39-3 Diatomaceous calcined;

— 68 855-54-9 Flux calcined.

1) Chemical Abstracts Service Registry Number.

4.1.5 EINECS reference [2)]

Calcined 293-303-4.

4.2 Commercial form

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

5 Physical properties

5.1 Appearance

The product is a white (flux calcined), pink (calcined), or white to green (natural), 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 — bulk density packed

The bulk density packed shall be in the range of 150 kg/m^3 to 550 kg/m^3.

6 Chemical properties

This European Standard specifies the minimum purity requirements for powdered diatomaceous earth 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 %
SiO_2	min	85
Mass loss at 150 °C	max	5

After filling, washing and commissioning of a filter system producing drinking water, powdered diatomaceous earth 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 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.

8.2.5 Permeability

The permeability shall be determined in accordance with EN 12902.

8.2.6 Cake density

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

9 Labelling, transportation and storage

9.1 Means of delivery

Diatomaceous earth 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)]

The following labelling requirements shall apply to powdered diatomaceous earth at the date of publication of this European Standard.

Hazard pictogram	
	— Signal word: **Warning** — Hazard statements: H332: Harmful if inhaled NOTE Precautionary statements ('P statements') should be provided by the company being responsible for the marketing of the substance. They should be indicated on the packaging label and in the extended safety data sheet (eSDS) of the substance.

Figure 1 — GHS07

The regulation [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.

9.3 Transportation regulations and labelling

Powdered diatomaceous earth is not classified as a dangerous product for road, rail, sea or air transportation.

3) See [2].

Powdered diatomaceous earth is not listed under a UN Number [4)].

9.4 Marking

The marking shall include the following:

— name "Powdered diatomaceous earth", trade name and grade;

— net mass;

— name and the address of supplier and/or manufacturer;

— statement "this product conforms to EN 12913".

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.

4) United Nations Number.

Annex A
(informative)

General information on powdered diatomaceous earth

A.1 Origin

A.1.1 Raw materials

Powdered diatomaceous earths are produced by mining natural diatomite, which is a deposit of monocellular algae.

A.1.2 Manufacturing process

Diatomite is dried and ground. Particles over 50 µm in size are removed by cyclones or selectors, and then products are calcined in a kiln between 950 °C and 1 200 °C, depending on the product being manufactured. The increased temperature agglomerates the diatomaceous earths; this is very useful to get a wide range of products. If more agglomeration is needed, diatomaceous earths are activated with sodium carbonate between 1 000 °C and 1 200 °C. This gives coarser and white diatomaceous earths.

As these treatments give a superficial fusion of diatomaceous particles, the specific surface area of the calcined or flux calcined product is lower than the specific surface area of the raw material.

A.2 Typical properties

A.2.1 Composition of commercial product

The content of silica (SiO_2), on a calcined basis, should be not less than a mass fraction of 85 %.

The main impurities are:

— Aluminium oxide Al_2O_3;

— Iron oxide Fe_2O_3;

— Titanium oxide TiO_2;

— Calcium oxide CaO;

— Magnesium oxide MgO;

— Potassium oxide K_2O;

— Sodium oxide Na_2O.

The total impurity content should be lower than a mass fraction of 15 %.

In the case of diatomaceous earths activated with Na_2CO_3, the mass fraction of sodium oxide is around 4 %.

A.2.2 Density

The absolute density of the product is 2,2 g/cm^3.

A.3 Use

Powdered diatomaceous earths are used to remove solid contaminants from water by retention.

A.4 Hydraulic characteristics

A.4.1 Permeability

The permeability of calcined products is from 0,030 Darcy to 0,500 Darcy (1 Darcy = 0,987 x 10^{-12} m^2).

The permeability of activated (or flux calcined) products is from 0,5 Darcy to 15 Darcy.

A.4.2 Cake density

The cake density is in the range 0,38 g/cm^3 to 0,41 g/cm^3 for all products.

Annex B
(normative)

General rules relating to safety

B.1 Rules for safe handling and use

The supplier shall provide current safety instructions.

Powdered diatomaceous earth can cause damage to health if the powder is inhaled and the following precautions shall be taken:

— avoid dust formation;

— when handling dry product use a dust mask.

B.2 Emergency procedures

B.2.1 First aid

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

In case of contact with eyes, flush with plenty of water.

In case of inhalation, move to fresh air.

B.2.2 Spillage

Sweep up and discard in a refuse container or repackage.

The product is slippery when wet.

B.2.3 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).

This page deliberately left blank

This page deliberately left blank

British Standards Institution (BSI)

BSI is the independent national body responsible for preparing British Standards and other standards-related publications, information and services. It presents the UK view on standards in Europe and at the international level.

BSI is incorporated by Royal Charter. British Standards and other standardisation products are published by BSI Standards Limited.

Revisions

British Standards and PASs are periodically updated by amendment or revision. Users of British Standards and PASs should make sure that they possess the latest amendments or editions.

It is the constant aim of BSI to improve the quality of our products and services. We would be grateful if anyone finding an inaccuracy or ambiguity while using British Standards would inform the Secretary of the technical committee responsible, the identity of which can be found on the inside front cover. Similary for PASs, please notify BSI Customer Services.

Tel: +44 (0)20 8996 9001 Fax: +44 (0)20 8996 7001

BSI offers BSI Subscribing Members an individual updating service called PLUS which ensures that subscribers automatically receive the latest editions of British Standards and PASs.

Tel: +44 (0)20 8996 7669 Fax: +44 (0)20 8996 7001
Email: plus@bsigroup.com

Buying standards

You may buy PDF and hard copy versions of standards directly using a credit card from the BSI Shop on the website **www.bsigroup.com/shop.** In addition all orders for BSI, international and foreign standards publications can be addressed to BSI Customer Services.

Tel: +44 (0)20 8996 9001 Fax: +44 (0)20 8996 7001
Email: orders@bsigroup.com

In response to orders for international standards, BSI will supply the British Standard implementation of the relevant international standard, unless otherwise requested.

Information on standards

BSI provides a wide range of information on national, European and international standards through its Knowledge Centre.

Tel: +44 (0)20 8996 7004 Fax: +44 (0)20 8996 7005
Email: knowledgecentre@bsigroup.com

BSI Subscribing Members are kept up to date with standards developments and receive substantial discounts on the purchase price of standards. For details of these and other benefits contact Membership Administration.

Tel: +44 (0)20 8996 7002 Fax: +44 (0)20 8996 7001
Email: membership@bsigroup.com

Information regarding online access to British Standards and PASs via British Standards Online can be found at **www.bsigroup.com/BSOL**

Further information about British Standards is available on the BSI website at **www.bsi-group.com/standards**

Copyright

BSI

389 Chiswick High Road London W4 4AL UK

Tel +44 (0)20 8996 9001
Fax +44 (0)20 8996 7001
www.bsigroup.com/standards

raising standards worldwide™