

**Produkter för beredning av dricksvatten –
Oorganiska filterhjälpmedel och filtermaterial –
Provningsmetoder**

**Products used for treatment of water intended
for human consumption – Inorganic supporting
and filtering materials – Methods of test**

Europastandarden EN 12902:2004 gäller som svensk standard. Detta dokument innehåller den officiella engelska versionen av EN 12902:2004.

Denna standard ersätter SS-EN 12902, utgåva 1.

The European Standard EN 12902:2004 has the status of a Swedish Standard. This document contains the official English version of EN 12902:2004.

This standard supersedes the Swedish Standard SS-EN 12902, edition 1.

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Telefon: 08 - 555 523 10. *Telefax:* 08 - 555 523 11
E-post: sis.sales@sis.se. *Internet:* www.sis.se

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English version

Products used for treatment of water intended for human consumption - Inorganic supporting and filtering materials - Methods of test

Produits chimiques utilisés pour le traitement de l'eau destinée à la consommation humaine - Matériaux inorganiques de filtration et de support - Méthodes d'essai

Produkte zur Aufbereitung von Wasser für den menschlichen Gebrauch - Anorganische Filterhilfs- und Filtermaterialien - Prüfverfahren

This European Standard was approved by CEN on 30 September 2004.

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 Central Secretariat 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 Central Secretariat has the same status as the official versions.

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



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

Management Centre: rue de Stassart, 36 B-1050 Brussels

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Foreword

This document (EN 12902:2004) 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 2005, and conflicting national standards shall be withdrawn at the latest by May 2005.

This document supersedes EN 12902:1999.

Significant technical differences between this edition and EN 12902:1999 are as follows:

- a) Addition in 5.2.6 of a requirement to round results to the nearest 10 kg/m³.
- b) Modification of Table 4 to specify analytical performance characteristics instead of specific methods.
- c) Modification of 6.5 to allow the use of a larger test sample.
- d) Deletion of clause 7 (Determination of polynuclear aromatic hydrocarbons (PAH) in aqueous extracts).
- e) Correction of figure A.2.

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

EN 12902:2004 (E)**1 Scope**

This document specifies methods of test to determine physical and chemical properties of Inorganic Supporting and Filtering Materials (ISFM).

NOTE The applicability of the methods is specified in the relevant product standard.

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

EN ISO 3696, *Water for analytical laboratory use – Specification and test methods (ISO 3696:1987).*

ISO 562, *Hard coal and coke – Determination of volatile matter.*

ISO 565, *Test sieves – Metal wire cloth, perforated metal plate and electroformed sheet – Nominal sizes of openings.*

ISO 609, *Solid mineral fuels – Determination of carbon and hydrogen – High temperature combustion method.*

ISO 2395, *Test sieves and test sieving – Vocabulary.*

ISO 2591-1, *Test sieving – Part 1: Methods using test sieves of woven wire cloth and perforated metal plate.*

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

ISO 6206, *Chemical products for industrial use – Sampling – Vocabulary.*

ISO 8213, *Chemical products for industrial use – Sampling techniques – Solid chemical products in the form of particles varying from powders to coarse lumps.*

ISO 9276-1, *Representation of results of particle size analysis – Part 1: Graphical representation.*

ISO 13320-1, *Particle size analysis – Laser diffraction methods – Part 1: General principles.*

3 Terms and definitions

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

4 Sampling

Observe the recommendations of ISO 3165 and see ISO 6206. Sample in accordance with ISO 8213 and obtain the laboratory sample from the bulk sample by using a divider.

EN 12902:2004 (E)**5.1.4.3 Apparatus**

Ordinary laboratory apparatus together with the following.

5.1.4.3.1 Laser diffraction instrument (see ISO 13320-1).

5.1.4.4 Measurement

Disperse the sample in a suitable fluid (e.g. water, see ISO 13320-1) and introduce it into the analyzer in accordance with the manufacturer's recommendations. Adjust the measurement conditions by carrying out repetitive analyses to optimize reproducibility. Measure the scattering pattern and convert the results to particle size distribution following the recommendations in ISO 13320-1.

5.1.5 Expression of results

The results shall be presented as a cumulative particle size distribution curve in accordance with ISO 9276-1.

5.1.6 Processing of results

From the cumulative particle size distribution curve, determine the value of the following parameters:

- effective size d_{10} ;
- uniformity coefficient U ;
- minimum size d_1 ;
- oversize percentage;
- undersize percentage.

5.2 Bulk density (loose and packed)**5.2.1 General**

This method of measurement is not routinely used for materials with particle size greater than 4 mm.

5.2.2 Principle

The volume of dried ISFM, loose or packed, is determined in a measuring cylinder; dividing the mass of dried ISFM by its volume gives the bulk density.

5.2.3 Apparatus

Ordinary laboratory apparatus and glassware together with the following.

- 5.2.3.1** Balance with a capacity of 500 g or 2 000 g depending on volume of sample (see Table 1), with an accuracy of ± 1 g.
- 5.2.3.2** Desiccator.
- 5.2.3.3** Oven capable of being controlled at (105 ± 2) °C.
- 5.2.3.4** Graduated measuring cylinder of (250 ± 2) ml or $(1\ 000 \pm 10)$ ml according to Table 1.

5.2.4 Preparation of the sample

Dry a sufficient quantity of ISFM at (105 ± 2) °C to constant mass. Return to ambient temperature in the desiccator.

NOTE Porous material should be dried at (150 ± 2) °C.

The volume of sample is determined according to the particle size of ISFM (Table 1).

Table 1 – Minimum ISFM sample volume according to particle size

ISFM	Maximum particle size mm	Measuring cylinder volume ml	Minimum sample volume ml
Powder	< 0,4	250 ± 2	100
Granular material	0,4 to 4	1 000 ± 10	500

5.2.5 Procedure

5.2.5.1 Loose material

Weigh the empty measuring cylinder and note its mass m_0 to the nearest 1 g. With the measuring cylinder (5.2.3.4) positioned vertically, pour the sample of ISFM into the measuring cylinder. Measure the volume of the loose material V_1 to the nearest 10 ml. Weigh the measuring cylinder full and note its mass m_1 to the nearest 1 g.

5.2.5.2 Packed material

Weigh the empty measuring cylinder (5.2.3.4) and note its mass m_0 to the nearest 1 g. With the measuring cylinder positioned vertically, pour the minimum volume of ISFM according to Table 1 into the measuring cylinder. Tap the walls of the measuring cylinder with a glass rod covered with a rubber sleeve until the volume of ISFM remains constant. Measure the volume V_1 . Weigh the measuring cylinder full and note its mass m_1 to the nearest 1 g.

5.2.6 Expression of result

The bulk density (ρ) of the material expressed in kilograms per cubic metre is calculated from the following equation:

$$\rho = \frac{m_1 - m_0}{V_1} \times 1000 \quad (1)$$

where

m_0 is the mass of the measuring cylinder, in grams;

m_1 is the mass of the sample of ISFM and the measuring cylinder, in grams;

V_1 is the volume of the ISFM in the measuring cylinder, in millilitres.

Express the result to the nearest 10 kg/m³.

EN 12902:2004 (E)**5.3 Permeability of powders****5.3.1 General**

The method is applicable to ISFM with median diameter (d_{50}) between 5 μm and 200 μm .

5.3.2 Principle

Measurement of the time needed for a fixed volume of water to flow across a cake of ISFM of precise dimensions under specified conditions of temperature and pressure.

5.3.3 Reagent

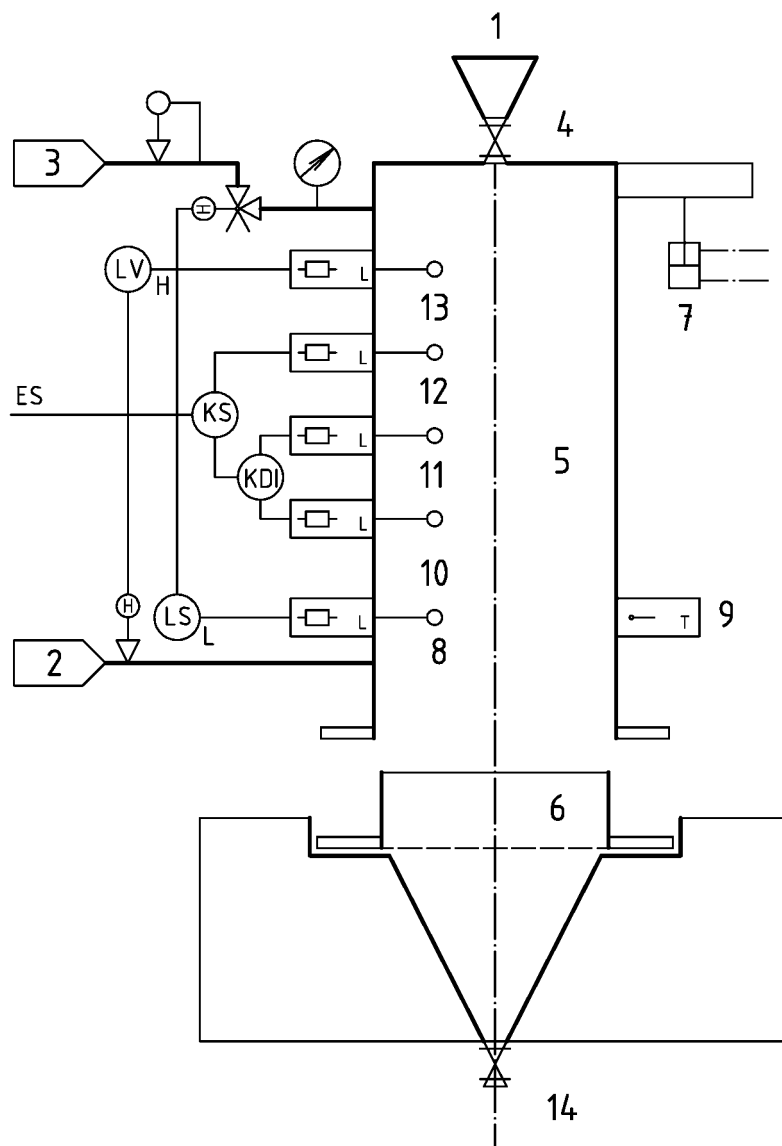
The fluid used for the test shall be water conforming to grade 3 in accordance with EN ISO 3696.

5.3.4 Apparatus

Ordinary laboratory apparatus and glassware together with the following

5.3.4.1 Permeameter

Figure 1 gives an example of a permeameter.



Key

- | | | | |
|---|--------------------------|-------|--------------------|
| 1 | funnel | 7 | pneumatic jack |
| 2 | test fluid | 8 | electric shut down |
| 3 | compressed air | 9 | thermometer |
| 4 | valve | 10-13 | electrodes |
| 5 | measurement chamber | 14 | drain valve |
| 6 | cylindrical cake carrier | | |

Figure 1 – Example of permeameter