SLOVENSKI STANDARD
SIST EN 14898:2006+A1:2007

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Oprema, ki se uporablja za pripravo pitne vode v stavbah - Filtri z aktivnimi snovmi - Zahteve za delovanje, varnost in preskušanje

Water conditioning equipment inside buildings - Active media filters - Requirements for performance, safety and testing

Anlagen zur Behandlung von Trinkwasser innerhalb von Gebäuden - Filter mit aktiven Substanzen - Anforderungen an Ausführung, Sicherheit und Prüfung

Appareils de traitement d'eau a l'intérieur des bâtiments - Filtres a substance active - Exigences de performance, de sécurité et essais

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Water conditioning equipment inside buildings - Active media filters - Requirements for performance, safety and testing

Appareils de traitement d'eau à l'intérieur des bâtiments - Filtres à substance active - Exigences de performance, de sécurité et essais

Anlagen zur Behandlung von Trinkwasser innerhalb von Gebäuden - Filter mit aktiven Substanzen - Anforderungen an Ausführung, Sicherheit und Prüfung

This European Standard was approved by CEN on 27 April 2006 and includes Amendment 1 approved by CEN on 10 May 2007.

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Foreword

This document (EN 14898:2006+A1:2007) has been prepared by Technical Committee CEN/TC 164 “Water supply”, the secretariat of which is held by AFNOR.

This document shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by December 2007 and conflicting national standards shall be withdrawn at the latest by December 2007.

This document includes Amendment 1, approved by CEN on 2007-05-10.

This document supersedes EN 14898:2006.

The start and finish of text introduced or altered by amendment is indicated in the text by tags A1⟩ ⟨A1.

With respect to potential adverse effects on the quality of water intended for human consumption caused by the product covered by this standard, the following is pointed out to the user:

1) This standard provides no information as to whether the product may be used without restriction in any of the Member States.

2) It should be noted that, while awaiting the adoption of verifiable European criteria, existing national regulation concerning the use and/or the characteristics of this product remain in force.

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

1 Scope

This European Standard specifies requirements relating to the construction, performance and methods of testing for active media filters for drinking water installations inside buildings, with a maximum working pressure of at least 1 000 kPa and a maximum working temperature of less than 30 °C. It only concerns units, which are permanently connected to the mains supply at the point of entry or point of use.

This standard applies only to filter systems comprising a housing and filter media tested together.

It includes capsule type units where both the element and its outer housing are disposable.

NOTE Products intended for use in water supply systems are to comply, when existing, with national regulations and testing arrangements that ensure fitness for contact with drinking water. The Member States relevant regulators and the EC Commission agreed on the principle of a future unique European Acceptance Scheme (EAS) which would provide a common testing and approval arrangement at European level.

If and when the EAS is adopted, European Standards on products will be amended by the addition of an Annex Z/EAS under Mandate M/136 which will contain formal references to the testing, certification and product marking requirements of the EAS. Until the EAS comes into force, the current national regulations remain applicable.

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 1717, *Protection against pollution of potable water in water installations and general requirements of devices to prevent pollution by backflow*

EN 12903, *Products used for treatment of water intended for human consumption — Powdered activated carbon*

EN 12904, *Products used for treatment of water intended for human consumption — Silica sand and silica gravel*

EN 12905, *Products used for treatment of water intended for human consumption — Expanded aluminosilicate*

EN 12906, *Products used for treatment of water intended for human consumption — Pumice*

EN 12907, *Products used for treatment of water intended for human consumption — Pyrolyzed coal material*

EN 12909, *Products used for treatment of water intended for human consumption — Anthracite*

EN 12910, *Products used for treatment of water intended for human consumption — Garnet*

EN 12911, *Products used for treatment of water intended for human consumption — Manganese Greensand*

EN 12912, *Products used for treatment of water intended for human consumption — Barite*

EN 12913, *Products used for treatment of water intended for human consumption — Powdered diatomaceous earth*

EN 12914, *Products used for treatment of water intended for human consumption — Powdered perlite*

EN 12915-1, *Products used for treatment of water intended for human consumption — Granular activated carbon — Part 1: Virgin granular activated carbon*

EN 13752, *Products used for treatment of water intended for human consumption — Manganese dioxide*

EN 13753, *Products used for treatment of water intended for human consumption — Granular activated alumina*

EN 13754, *Products used for treatment of water intended for human consumption — Bentonite*

EN 14368, *Products used for treatment of water intended for human consumption — Manganese dioxide coated limestone*

EN 14369, *Products used for treatment of water intended for human consumption — Iron-coated granular activated alumina*

EN 27888, *Water quality — Determination of electrical conductivity (ISO 7888:1985)*

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

EN ISO 7027, Water *quality — Determination of turbidity (ISO 7072:1999)*

EN ISO 7393-1, Water *quality — Determination of free chlorine and total chlorine — Part 1: Titrimetric method using N,N-diethyl-1,4-phenylenediamine (ISO 7393-1:1985)*

ISO 10523, *Water quality — Determination of pH*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
active media
adsorbent, ion exchange or chemically active material that removes or significantly reduces a component from water by chemical reaction or by virtue of ionic charge or other surface activity

3.2
capsule cartridge
sealed cartridge, designed to be used in a support housing

NOTE For this design, the housing may not be watertight.

3.3
capsule filter
complete filter, for which the filter element and the filter housing are inseparable and the housing is discarded with the spent element

3.4
cartridge
replaceable filter element

NOTE This includes any other components that the manufacturer specifies should be changed when the cartridge exchange is due.

3.5
cartridge exchange indicator
means by which the need to change a cartridge is indicated

NOTE It may work by elapsed time, throughput of water or any other suitable method of indication. This indicator can only be regarded as a guide.

3.6
identification mark
identification on the product and/or packaging that the product conforms to the requirements of this standard, e.g. "This product conforms to prEN 14898"

3.7
filter element
part of the filter that contains the active media

3.8
filter rated capacity
volumetric capacity of the filter claimed by the manufacturer

NOTE If more than one substance-specific reduction claim is made by the manufacturer, the filter rated capacity is the capacity for the substance with the lowest substance-specific rated capacity.

3.9
maximum working pressure
manufacturer's stipulated maximum water supply pressure above which the structural integrity of the system may be compromised

3.10
maximum working temperature
manufacturer's stipulated maximum water supply temperature above which filter performance and/or structural integrity of the system may be compromised

3.11
minimum reduction rate
minimum percentage reduction achieved by a filter with respect to a specified substance, as defined in the performance requirements of this standard

3.12
minimum working pressure
manufacturer's stipulated minimum water supply pressure below which filter performance may be compromised

3.13
minimum working temperature
manufacturer's stipulated minimum water supply temperature below which filter performance and/or structural integrity of the system may be compromised

3.14
substance-specific rated capacity
volume of water, in litres, that the filter is capable of treating to the minimum reduction rate with respect to a specific substance

3.15
unit volume
internal empty vessel volume of the complete system which is in contact with the drinking water

3.16
working flow range
manufacturer's stipulated maximum and minimum flow rates outside of which the performance of the filter may be compromised

4 System design requirements

4.1 Materials of construction

Active media shall conform to the requirements for water extractable substances in EN 12903, EN 12904, EN 12905, EN 12906, EN 12907, EN 12909, EN 12910, EN 12911, EN 12912, EN 12913, EN 12914, EN 12915-1, EN 13752, EN 13753, EN 13754, EN 14368 or EN 14369, if and as appropriate.

4.2 Working conditions

4.2.1 Working temperature

The filter shall be designed to operate to the requirements of this standard at:

— minimum ambient air and water temperatures of not less than 5 °C;

— maximum water temperature of at least 30 °C;

— maximum ambient air temperature of at least 30 °C.

4.2.2 Working flow

Performance tests shall be performed at the maximum of the working flow range stipulated by the manufacturer.

If the filter system is not fitted with a flow regulator, the manufacturer shall provide guidance in the operating instructions for adjusting the flow such that it does not exceed the maximum of the working flow range.

4.3 Filter cartridge replacement

Any tools necessary for routine maintenance shall not come into contact with the water intended for human consumption. Any special tools shall be provided by the equipment supplier.

The system shall be designed, and suitable instructions provided, such that contamination of the treated water supply is avoided during the filter cartridge change procedure.

4.4 End connections

Any fittings supplied with the filter to connect it to existing pipework, shall conform to the requirements of the relevant European Standards, and, for point-of-entry installation, shall be minimum size DN 15.

4.5 Backflow prevention

Backflow prevention shall be provided in accordance with the national implementation of EN 1717.

4.6 Exchange indicator

An active media filter system shall incorporate a cartridge exchange indicator, which gives a guide to the remaining life of the element based on filtration capacity, along with a clear statement of the maximum period of time after which the cartridge has to be changed.

5 Performance requirements

5.1 Pressure strength of the filter housing

When subjected to a hydraulic test as defined in 6.1, there shall be no visible leakage or damage.

5.2 Dynamic pressure test of housing

While subject to a cyclic pressure test as described in 6.2, the filter housing shall show no visible signs of leakage or damage.

In the case of a capsule type filter, this test shall be omitted but the dynamic pressure test as described in 6.3 shall be completed.

5.3 Dynamic pressure test of cartridge

While subject to a cyclic pressure test as described in 6.3, the filter cartridge shall show no visible signs of leakage or damage.

5.4 Pressure drop

When subjected to the maximum of the working flow range as described in 6.4, the filter, with a clean element, shall not develop a pressure drop higher than the manufacturer's declared value.

5.5 Substance reduction performance

5.5.1 Performance claims

Any or all of the performance claims covered by this clause may be made by the filter manufacturer but where more than one substance performance claim is made, the rated capacity shall be that for the lowest substance-specific capacity.

5.5.2 Chlorine reduction

When tested in accordance with 6.5, the reduction in chlorine achieved shall be categorized as follows:

Class 1 : ≥ 90 % reduction

Class 2 : ≥ 75 % to < 90 % reduction

5.5.3 Organic chemical reduction

When tested in accordance with 6.6, the unit shall reduce the specified chemical parameter by at least 90 % from an influent concentration of 10 times the regulated value (see A1 [2] A1) or the World Health Organisation (WHO) Guidelines value (see A1 [3] A1). With the exception of trihalogenmethanes (THM) (for which chloroform may be used as a surrogate), tests for reduction of each specific substance, for which the manufacturer makes a claim, shall be carried out: other than for THMs, claims for reduction of generic groups (such as pesticides, polycyclic aromatic hydrocarbons (PAH), etc.) of organic chemicals cannot be claimed under this standard.

NOTE The protocols specified in 6.6 can be adapted to test the reduction of substances not specifically covered by the performance requirements of this standard (see Annex C). Claims for the reduction of such substances are clearly separated from the claims made of conformity to this standard (see 7.1).

5.5.4 Odour and flavour reduction

When tested in accordance with 6.6, the unit shall reduce the level of geosmin from 0,15 µg/l to 0,015 µg/l and, in a separate test, it shall reduce the level of 2,4,6-trichlorophenol from 20 µg/l to 2 µg/l. For compliance with this standard, separate claims for odour or flavour reduction are not permitted.

5.5.5 Inorganic chemical reduction

When tested in accordance with 6.6, the unit shall meet the criteria given in Table 1 for any or all of the substances tested.

Table 1 — Chemical reduction requirements

Determinant	Concentration units	Influent concentration C_i	Effluent percentage reduction
Lead	µg/l Pb	100 ± 10	90
Copper	mg/l Cu	3 ± 0,3	80
Aluminium	µg/l Al	600 ± 60	70
Nitrate	mg/l NO_3	200 ± 20	75[a]
Carbonate hardness	mg/l $CaCO_3$	300 ± 30	50

a In the case of nitrate, to check that excessive formation of nitrite is not occurring, filtered water samples shall be analyzed for nitrite as well as nitrate and an additional condition shall be fulfilled: $\frac{\rho(NO_3)}{50} + \frac{\rho(NO_2)}{3} \leq \frac{C_i}{200}$.

NOTE The protocols specified in 6.6 of this standard can be adapted to test the reduction of substances not specifically covered by the performance requirements of this standard (see Annex C). Claims for the reduction of such substances are clearly separated from the claims made of conformity to this standard (see also 7.1).

6 Test methods

6.1 Static pressure test of filter housing

6.1.1 Principle

The filter is mounted in a test rig and a water pressure 1.5 times the maximum working pressure is applied for 10 min. The filter is examined for visible evidence of leakage or damage.

6.1.2 Procedure

Install the filter in a test rig as shown in Figure 1. The pressure gauge shall be installed at the outlet of the test specimen. It shall be ensured that the pressure at the outlet of the system is at the specified value. Flush with water to purge air from the filter. Increase the water pressure to 1.5 times the maximum working pressure at a minimum rate of 0,1MPa/s. Maintain the pressure for 10^{+2}_{0} min. Examine the filter for visible evidence of leakage or damage.