

**Vattenförsörjning – Invändig utrustning –
Mekaniska filter –**

Del 1: Partikelstorlek 80 µm - 150 µm –
Utförandekrav, säkerhet och provning

**Water conditioning equipment inside buildings –
Mechanical filters –**

Part 1: Particle rating 80 µm to 150 µm –
Requirements for performances, safety and
testing

Europastandarden EN 13443-1:2002 gäller som svensk standard. Detta dokument innehåller den officiella engelska versionen av EN 13443-1:2002.

The European Standard EN 13443-1:2002 has the status of a Swedish Standard. This document contains the official English version of EN 13443-1:2002.

Dokumentet består av 24 sidor.

Upplysningar om **sakinnehållet** i standarden lämnas av SIS, Swedish Standards Institute, tel 08 - 555 520 00.

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 13443-1

December 2002

ICS 13.060.20; 91.140.60

English version

Water conditioning equipment inside buildings - Mechanical filters - Part 1: Particle rating 80 µm to 150 µm - Requirements for performances, safety and testing

Appareils de conditionnement d'eau à l'intérieur des bâtiments - Filtres mécaniques - Partie 1: Particules de dimension comprise entre 80 µm et 150 µm - Spécifications de performances et de sécurité, essais

Anlagen zur Behandlung von Trinkwasser innerhalb von Gebäuden - Mechanisch wirkende Filter - Teil 1: Filterfeinheit 80 µm bis 150 µm - Anforderungen an Ausführung und Sicherheit, Prüfung

This European Standard was approved by CEN on 23 October 2002.

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 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 Management Centre has the same status as the official versions.

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



EUROPEAN COMMITTEE FOR STANDARDIZATION
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Foreword

This document (EN 13443-1:2002) 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 June 2003, and conflicting national standards shall be withdrawn at the latest by June 2003.

Annex A is informative.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland 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 standard:

- 1) 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;
- 2) 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.

1 Scope

Part 1 of this European Standard applies to mechanical filters for drinking water installations inside buildings, of nominal size from DN 15 to DN 100, minimum nominal pressure PN10, particle rating of 80 µm to 150 µm, and minimum design temperature of 30 °C. It specifies requirements relating to the construction and mode of operation of filters and describes relevant methods of testing. It only concerns units which are permanently connected to the mains supply at the point of entry into the building.

Part 2 of this European Standard (prEN 13443-2) is a separate document and deals with filters with a particle size limit less than 80 µm.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text, and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

EN 1333, *Pipe work components - Definition and selection of PN.*

EN 1567, *Building valves - Water pressure reducing valves and combination water pressure reducing valves - Characteristics and tests.*

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

EN ISO 3822-3, *Acoustics - Laboratory tests on noise emission from appliances and equipment used in water supply installations - Part 3: Mounting and operating conditions for in-line valves and appliances (ISO 3822-3:1997).*

EN ISO 6509, *Corrosion of metals and alloys - Determination of dezincification resistance of brass (ISO 6509:1981).*

ISO 7-1, *Pipe threads where pressure-tight joints are made on the threads - Part 1: Dimensions, tolerances and designation.*

ISO 228-1, *Pipe threads where pressure-tight joints are not made on the threads - Part 1: Dimensions, tolerances and designation.*

3 Terms and definitions

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

3.1

drinking Water

water intended for human consumption as defined in Directive 98/83/EC (see "A")

3.2

mechanical Filters

appliances designed to remove undissolved substances from water, down to a specified particle size

3.3

filter element

part of a filter designed to ensure the retention of particles

EN 13443-1:2002 (E)**3.4****grade of filtration**

ability of a filter to retain particles and suspended matter of a given size range irrespective of the nature of the material used in the filter element, defined by the maximum and minimum filter particle rating

3.5**minimum particle rating**

number determining the particle size, in μm , of a material 90 % by mass of which is able to pass through the filter under test conditions

3.6**maximum particle rating**

number determining the particle size, in μm , of a material 10 % by mass of which is able to pass through the filter under test conditions

3.7**filter surface velocity**

flow rate divided by the filter surface area, expressed in $\text{m}^3/(\text{h cm}^2)$

3.8**nominal flow rate**

clean filter flow rate at which either the pressure drop does not exceed a value of 50 kPa (0,5 bar), or the filter surface velocity does not exceed the maximum specified value, whichever is lower

4 Classification**4.1 Principle**

Mechanical filters shall be designated by:

- nominal size DN;
- end connections;
- filter type;
- nominal pressure PN.

The designation shall be clearly identified on the manufacturer's rating plate or in the instruction manual. Examples are given in annex A.

4.2 Nominal size (DN)

The nominal size DN shall correspond to the flow rates in Table 2. The inlet connection of the filter may be DN or one size larger or one size smaller than the nominal size DN. In the case of flange connections the nominal size DN is determined by the DN of the inlet connection.

4.3 End Connections

Examples of end connections are shown in annex A. Combinations of two kinds of connections are possible.

4.4 Filter Type

Filters conforming to this standard shall be presented as one of the following types:

- filters requiring single use filter elements;

— backwashing filters filter elements cleaned by backwashing (without any dismantling).

4.5 Nominal Pressure (PN)

The nominal pressure PN shall correspond to EN 1333.

5 Materials (Chemical and hygienic behaviour of materials)

The selection of materials shall be the responsibility of the manufacturer, provided that the complete filter satisfies the requirements of EN 1567.

NOTE The materials and coatings used should not contaminate or change the drinking water, when in normal or accidental contact up to the maximum designed temperature.

The requirements , with regard to the effects of materials on drinking water quality, are specified in national regulations.

The manufacturer shall state in his technical literature what materials and coatings are used. The materials, in particular copper alloys, shall conform to relevant national standards or recommendations. These references shall be stated.

Copper-zinc alloys containing more than 10 % zinc are subject to dezincification when submitted to water capable of dezincification. In countries where the use of products made of dezincification resistant material is required, the product have to guarantee a dezincification depth less than 200 µm in any direction. They have to be tested and marked in accordance with EN ISO 6509 and have to be marked in compliance with the indications under clause 9 of the present standard.

6 General design requirements

6.1 Backwashable filters

Backwashable filters shall be able to be cleaned without the aid of tools. No substances shall be allowed to penetrate into the drinking water supply as a result of the cleaning operation. After completion of backwashing, the original grade of filtration and pressure drop shall be recovered.

Backwashable filters shall be provided with a backwash water outlet, conforming to EN 1717.

It shall be possible to clean the filter mounted in any of the positions specified by the manufacturer with no interruption of filtered water supply during backwashing.

6.2 Single-use filters

Single use filters shall be designed in such a way that the filter elements can be replaced without any risk of contamination of the drinking water. It shall be possible to replace the filter mounted in any of the positions specified by the manufacturer.

Any tools used in this process shall not come into contact with drinking water and shall be provided by the manufacturer. If specific tools are necessary they shall be supplied by the manufacturer.

Replacement filter elements shall be single packaged to prevent contamination from outside.

6.3 Thermal stability

Filters shall be designed to withstand room and water temperatures of at least 30°C.

EN 13443-1:2002 (E)**7 Performances requirements****7.1 Bending Strength of the body**

When subjected to a bending moment in accordance with 8.2.1.2, there shall be no permanent deformation, fissures or ruptures.

7.2 Pressure Strength of the Filter Housing

When subjected to a hydraulic test as defined in 8.2.2, there shall be no visible leakage or permanent deformation.

7.3 Pressure Strength of the Filter Element

After being subjected to a differential pressure as described in 8.2.3.2, there shall be no visible deformation of the filter cartridge.

7.4 Dynamic Pressure Test

While subject to cyclic pressure test as described in 8.2.4 the filter housing shall show no visible signs of leakage or permanent deformation.

7.5 Pressure Drop

When subjected to the nominal flow rate as described in 8.3.1.2, the filter, with a clean element, shall not develop a pressure drop higher than 50 kPa.

7.6 Filter Surface Velocity

The filter surface velocity shall not exceed $0,15 \text{ m}^3/(\text{h cm}^2)$ for backwashable filters and $0,025 \text{ m}^3/(\text{h cm}^2)$ for replaceable cartridge filters at the nominal flow rate.

7.7 Filtration Rating

When tested in accordance with 8.4.2, the maximum filter rating shall be between 100 micrometres (μm) and 150 micrometres (μm) and the minimum filter rating shall be between 80 micrometres (μm) and 120 micrometres (μm).

8 Performance tests**8.1 Test Conditions**

Tests shall be carried out with the filter in the horizontal position, except for special models. Unless otherwise specified tolerances shall be $\pm 5\%$. Unless otherwise stated tests shall be carried out at room temperature with water between $10 \text{ }^\circ\text{C}$ and $30 \text{ }^\circ\text{C}$. If the designed water temperature is higher than $30 \text{ }^\circ\text{C}$, the designed temperature shall be used for the test.

8.2 Mechanical Performance**8.2.1 Bending strength of the body****8.2.1.1 Principle**

The mechanical bending strength of the body is tested by a bending moment test, in which a force is applied for a predetermined period.

8.2.1.2 Test Procedure

Fix the mechanical filter by one connection to a test apparatus as shown in Figure 1. Connect the other side to a metal tube and apply the appropriate force F in order to obtain the bending moment as given in Table 1.

Apply the bending moment for (30^{+10}_0) s.

Table 1 — Nominal size vs. bending moment

Nominal size		15	20	25	32	40	50	65	80	100
Bending moment	Threaded and flanged ends	80	150	300	400	500	600	750	950	1300
(Nm)	Compression ends	50	85	125	160	200	300	-	-	-

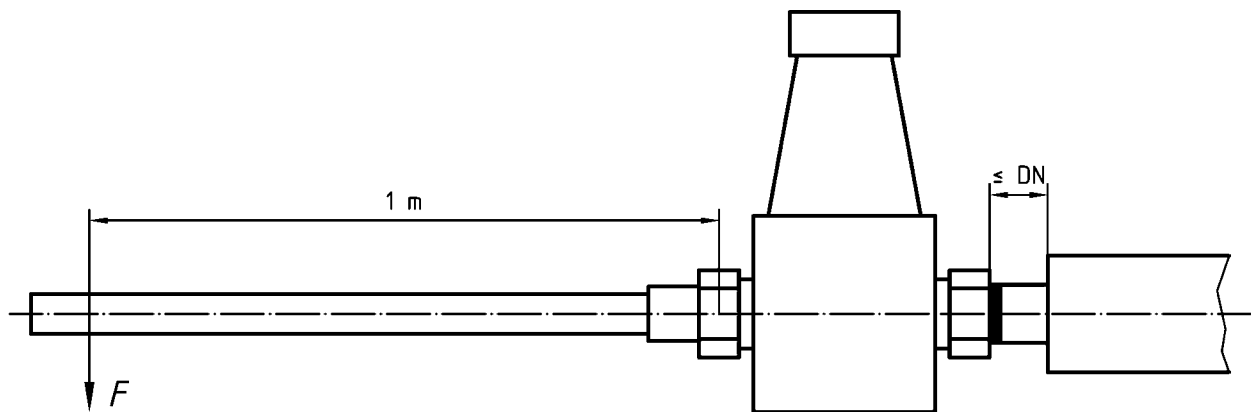


Figure 1 — Bending moment testing equipment

8.2.2 Static pressure strength and tightness of the filter

8.2.2.1 Principle

The pressure strength and water tightness of the filter shall be tested by applying a water pressure of 3 times the nominal pressure PN for a period of 10^{+2}_0 min.

Those filter components which are subject to hydrostatic pressure shall be designed for a nominal pressure of not less than 1 000 kPa (10 bar). According to EN 1567, the filters combined with pressure regulating valves shall be designed at a nominal pressure of not less than 1 600 kPa (16 bar).

8.2.2.2 Test Procedure

Install the filter in a test rig as shown in Figure 2. Increase the pressure to 3 times the nominal pressure PN. Maintain the pressure for 10^{+2}_0 min.