



**SLOVENSKI STANDARD**  
**SIST EN 12873-4:2006**  
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**Vpliv materiala na pitno vodo – Vpliv migracije – 4. del: Metoda preskušanja membran za pripravo vode**

Influence of materials on water intended for human consumption - Influence due to migration - Part 4: Test method for water treatment membranes

Einfluss von Materialien auf Wasser für den menschlichen Gebrauch - Einfluss infolge der Migration - Teil 4: Prüfverfahren für Membranen für die Wasserbehandlung

**iTeh STANDARD PREVIEW**

Influence sur l'eau des matériaux destinés à entrer en contact avec l'eau destinée à la consommation humaine - Influence de la migration - Partie 4 : Méthode d'essai des membranes des systèmes de traitement d'eau

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ICS 13.060.20; 67.250

English Version

Influence of materials on water intended for human consumption  
- Influence due to migration - Part 4: Test method for water  
treatment membranes

Influence des matériaux sur l'eau destinée à la  
consommation humaine - Influence due à la migration -  
Partie 4 : Méthode d'essai des membranes des systèmes  
de traitement d'eau

Einfluss von Materialien auf Wasser für den menschlichen  
Gebrauch - Einfluss infolge der Migration - Teil 4:  
Prüfverfahren für Membranen für die Wasserbehandlung

This European Standard was approved by CEN on 3 February 2006.

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, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.



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## Foreword

This document (EN 12873-4:2006) 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 September 2006, and conflicting national standards shall be withdrawn at the latest by September 2006.

It is derived from a CEN Workshop Agreement prepared by the Project Team of the CEN Workshop CWA Water Treatment Membranes.

This standard is one of a series of standards on test methods which support the appropriate standards.

It has been drawn up with the objective to describe a test method to determine the migration of substances from water treatment membranes.

Annex A, which is informative, provides a flow diagram of the steps in the test procedure.

Annex B, which is informative, describes a test rig.

This standard is the fourth in a series of standards dealing with the influence of migration from materials on water intended for human consumption, including:

- Part 1 Test method for non-metallic and non-cementitious factory made products;
- Part 2 Test method for non-metallic and non-cementitious site-applied materials;
- Part 3 Test method for ion exchange and adsorbent resins;
- Part 4 Test method for water treatment membranes.

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, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

## Introduction

In respect of potential adverse effects on the quality of water intended for human consumption caused by the materials, it is called to mind that, while awaiting the adoption of verifiable European acceptance criteria, the relevant national regulations remain in force.

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## 1 Scope

This European standard describes a test method for laboratory evaluation of possible adverse effects of water treatment membranes on drinking water quality.

In principle it is applicable to microfiltration, ultrafiltration, nanofiltration, reverse osmosis and electrodialysis modules for use in the treatment of public water supplies and of water inside buildings.

**NOTE** Such devices can vary considerably in design and operation and hence some modification of the procedures may be required.

Evaluation of the efficiency of the membrane filter in removing contaminants from the treated water is not included.

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

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## 3 Terms and definitions (standards.iteh.ai)

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

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**3.1 analytical sample**  
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 portion of the extract collected for the determination of specified water quality parameters

**3.2 cell pair**  
 basic unit of ED systems consisting of a cation transfer membrane, a dilute flow (product) spacer, an anion transfer membrane and a concentrate (waste) spacer

**3.3 electro dialysis**  
 process in which ionic species in a feed water are transferred by means of an electrical driving force via a membrane, which is either cation or anion specific, to a waste water stream

**3.4 feed water**  
 inlet water for the test rig

**3.5 leaching test/migration test**  
 determination of the effects on parameters of water quality following contact with the test sample under specified conditions

**3.6 leaching/migration**  
 process of transferring constituents from a material of the test sample into test water carried out under specified conditions

- 3.7 leachate/extract**  
test water after exposure to the test sample
- 3.8 membrane module**  
filtration element including the membrane itself and all parts of its housing and fittings
- 3.9 procedural blank**  
test water after contact with the test rig but not with the test sample under the same conditions used for the leaching test
- 3.10 product**  
manufactured item, in its finished form, that comes into contact with drinking water
- NOTE In case of membrane water treatment systems the product is a membrane module.
- 3.11 product water**  
treated water from the water treatment unit
- 3.12 reject water**  
tangential water that does not flow through the membrane
- 3.13 test rig**  
equipment, which is not part of the test sample, used to perform the test and control test conditions
- 3.14 test sample**  
product, or part of a product, submitted for testing for suitability for use in contact with water intended for human consumption
- 3.15 test water**  
water used in contact with the test sample for evaluation of migration behaviour

## 4 Symbols and abbreviations

ED Electrodialysis

## 5 Test method

### 5.1 Principle

Water of specified quality is run through a membrane module under specified operating conditions representing as much as possible the actual conditions of use. The procedure comprises several steps including flushing, operation with and without recycling and cleaning and/or disinfection, the latter depending on the manufacturers recommendations. The purpose of the recycling phase is to concentrate the potential contaminants leaching from the test sample. Samples of the concentrates and the single-pass extracts are taken for analysis.



The operating test temperature is maintained at the highest temperature approved by the manufacturer. In the absence of a recommended temperature it is  $(25 \pm 5)$  °C.

A schematic diagram of the test protocol is shown in Annex A.

Water treatment devices based on membrane technology can be different in design and operation and therefore the procedures described, such as operation conditions and cleaning, may need to be modified in some cases.

## 5.2 Reagents and apparatus

### 5.2.1 General

Only reagents of analytical grade shall be used, except where specified otherwise. All reagents shall be of sufficient purity to ensure that they do not give rise to interferences during the analysis of the extracts.

NOTE Contamination can arise from various sources, e.g. plastics or rubber materials. The use of procedural blanks and laboratory blanks assists in detecting any contamination and identifying its source.

### 5.2.2 Test water

The test water shall consist of purified water conforming to grade 3 of EN ISO 3696 with an electrical conductivity not exceeding  $(10 \pm 0,1)$   $\mu\text{S}/\text{cm}$ . It shall be free from organic contaminants that can interfere with the analysis of the extracts.

If testing with chlorinated test water is required then use test water according to 5.2.2 having an active chlorine content of  $(1 \pm 0,2)$  mg/l as  $\text{Cl}_2$ .

When testing electro dialysis modules the test water shall consist of purified water containing  $(1 \pm 0,1)$  g/l of NaCl.

NOTE Purification of water, such as tapwater, by a sequence consisting of carbon filtration, reverse osmosis or distillation and followed by deionization usually produces satisfactory test water.

### 5.2.3 Flushing water

The flushing water should be of a similar quality to the test water (5.2.2). Good quality tap water may be used provided that the following conditions are complied with:

- total organic carbon content of  $(<1,0 \text{ mg/l} \pm 0,1 \text{ mg/l})$  carbon;
- conductivity of  $<500 \mu\text{S}/\text{cm}$ ;
- it is free from organic contaminants that can interfere with the analysis of the extracts;
- flushing is finished with a volume of the test water, corresponding to  $(5 \pm 0,5)\%$  of the total volume used for flushing.

For products not intended for use in contact with chlorinated water only unchlorinated flushing water shall be used.

### 5.2.4 Cleaning agent

The type and use of agents to clean and/or disinfect the test sample shall be as recommended by the manufacturer.