



SLOVENSKI STANDARD

SIST EN 12873-3:2006

01-julij-2006

Vpliv materiala na pitno vodo – Vpliv migracije – 3. del: Preskusna metoda za ionsko izmenjavo in vpojne smole

Influence of materials on water intended for human consumption - Influence due to migration - Part 3: Test method for ion exchange and adsorbent resins

Einfluss von Materialien auf Wasser für den menschlichen Gebrauch - Einfluss infolge der Migration - Teil 3: Prüfverfahren für Ionenaustauscher und Adsorberharze

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Influence sur l'eau des matériaux destinés à entrer en contact avec l'eau destinée à la consommation humaine - Influence de la migration - Partie 3 : Méthode d'essai des résines adsorbantes et échangeuses d'ions

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English Version

Influence of materials on water intended for human consumption
- Influence due to migration - Part 3: Test method for ion
exchange and adsorbent resins

Influence des matériaux sur l'eau destinée à la
consommation humaine - Influence due à la migration -
Partie 3 : Méthode d'essai des résines absorbantes et
échangeuses d'ions

Einfluss von Materialien auf Wasser für den menschlichen
Gebrauch - Einfluss infolge der Migration - Teil 3:
Prüfverfahren für Ionenaustauscher und Adsorberharze

This European Standard was approved by CEN on 23 January 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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Contents	Page
Foreword	3
Introduction.....	4
1 Scope	5
2 Terms and definitions	5
3 Principle.....	6
4 Reagents.....	6
4.1 General.....	6
4.2 Cleaning liquids for glassware.....	6
5 Apparatus	7
6 Test samples	7
7 Pretreatment of test samples	7
8 Test procedure	7
8.1 General.....	7
8.2 Preparation of leachate sample	8
8.3 Procedural blanks	8
8.4 Analysis	8
9 Calculation of test results	9
10 Test report	9
Annex A (informative) Flow diagram.....	11
Annex B (informative) Test apparatus	12
Annex C (informative) Resin pre-treatment	13

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(standards.iteh.ai)

SIST EN 12873-3:2006

[https://standards.iteh.ai/catalog/standards/sist/2126bcab-9d7e-460c-95d0-](https://standards.iteh.ai/catalog/standards/sist/2126bcab-9d7e-460c-95d0-7e6814c53ad/sist-en-12873-3-2006)

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Foreword

This document (EN 12873-3:2006) 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.

This draft will result in 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 ion exchange and adsorbent resins.

Evaluation of the efficiency of resins, in removing contaminants, is not included.

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

Annex B, describes a test apparatus.

Annex C, provides information on resin pre-treatment.

This draft standard is the third 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 materials, it is to be remembered 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 specifies a procedure to determine the migration of substances from ion exchange and adsorbent resin materials for use in contact with water intended for human consumption.

Resins comprise synthetic organic macromolecular materials.

The standard is applicable to resins of the following types:

- Ion exchange resins: used to modify the composition of water (e.g. softening by removal of calcium ions). They can be in either an anionic or cationic state.
- Adsorbent resins: used to lower the concentration of undesirable substances (usually organic pollutants) from water. They are used in a neutral state.

2 Terms and definitions

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

2.1

test

technical operation that consists of the determination of one or more characteristics of a given product.

2.2

test procedure

specified technical method for performing a test

2.3

test report

document that presents test results and other information relevant to a test

2.4

testing laboratory

laboratory that performs tests

2.5

product

material, in its finished form that comes into contact with water

2.6

test sample

sample of a product submitted for testing

2.7

test water

water for migration testing (4.1)

2.8

blank water

test water (4.1) which has been kept at the same specified conditions as migration water (see clause 8) but without contact with the test sample.

2.9

migration

movement of a substance or substances from a test sample into the test water

2.10

bed volume

volume in litres of wet resin, tapped to a constant volume, used in the test

2.11

regeneration

part of the operating cycle of an ion-exchange resin process in which a specific chemical solution is passed through the resin bed to prepare it for a service run

2.12

exhaustion

process in which a specific chemical solution is passed through the regenerated ion exchange resin bed to exchange the ions in this solution for an equivalent amount of ions from the resin bed to simulate an accelerated service run

2.13

disinfection

procedure, normally using chemicals, such as sodium hypochlorite or peracetic acid, carried out on a resin to inactivate microorganisms

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3 Principle

If relevant, at the beginning of the test, the test sample is subjected to pretreatment procedures according to the manufacturer's instructions.

The test sample is brought into contact with test water during a static/dynamic procedure carried out at $(23 \pm 2) ^\circ\text{C}$.

Test water samples are collected for analysis after contact with the resin.

4 Reagents

4.1 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.

The test water shall be chlorine free water with a conductivity of $< 20 \mu\text{S/cm}$ at $25 ^\circ\text{C}$ and a total organic content (TOC) of $< 0,2 \text{ mg/l C}$, e.g. prepared by reverse osmosis, deionization or distillation, followed by activated carbon filtration.

4.2 Cleaning liquids for glassware

4.2.1 hydrochloric acid, concentrated (30 % mass per volume) analytical reagent grade.

4.2.2 hydrochloric acid solution, prepared by slowly adding $(0,5 \pm 0,01) \text{ l}$ of concentrated hydrochloric acid (4.2.1) to $(0,5 \pm 0,01) \text{ l}$ of test water (4.1).

NOTE Care is needed because the solution may generate heat.

4.2.3 nitric acid, concentrated (65 % mass per volume) analytical reagent grade.

4.2.4 nitric acid solution, prepared by slowly adding (0,5 ± 0,01) l of concentrated nitric acid (4.2.3) to (0,5 ± 0,01) l of test water (4.1).

NOTE Care is needed because the solution may generate heat.

5 Apparatus

5.1 Vessels, containers, stoppers and connections, consisting of a material, such as glass, PTFE or stainless steel, that is inert under the specified test conditions (see clause 8).

NOTE The material PTFE should only be used when there is a small contact area with the test water. Thus PTFE is unsuitable for containers

5.2 Test apparatus. An example testing arrangement is given in annex B.

5.3 Temperature control facility, such as a temperature-controlled laboratory, capable of maintaining the test apparatus at (23 ± 2) °C.

5.4 Laboratory glassware, cleaned by washing with a biodegradable laboratory detergent, followed by rinsing with either hydrochloric acid solution (4.2.2) or nitric acid solution (4.2.4) and finally by thoroughly rinsing with test water (4.1).

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6 Test samples

A representative sample of the resin shall be taken and treated according to manufacturer's instructions.

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7 Pretreatment of test samples

Exhaustion/regeneration of wet resins, if relevant, shall be carried out according to manufacturers instructions (see annex C).

Do not carry out any regeneration procedure in the test apparatus.

8 Test procedure

8.1 General

The temperature shall be maintained at (23 ± 2) °C throughout.

NOTE 1 The actual number of leachate samples to be taken, their analysis and assessment will be specified in national or other regulations.

NOTE 2 Whether single or multiple testing is to be carried out on a product will be specified in national or other regulations. The method assumes single testing.