



SLOVENSKI STANDARD

SIST EN 12873-3:2019

01-april-2019

Nadomešča:
SIST EN 12873-3:2006

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

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

Ta slovenski standard je istoveten z: EN 12873-3:2019

ICS:

13.060.20	Pitna voda	Drinking water
67.250	Materiali in predmeti v stiku z živili	Materials and articles in contact with foodstuffs

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en,fr,de

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EUROPEAN STANDARD

EN 12873-3

NORME EUROPÉENNE

EUROPÄISCHE NORM

February 2019

ICS 13.060.20; 67.250

Supersedes EN 12873-3:2006

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

Einfluss von Materialien auf Trinkwasser - Einfluß infolge der Migration - Teil 3: Prüfverfahren für Ionen und Adsorberharze

This European Standard was approved by CEN on 26 November 2018.

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 CEN-CENELEC 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 CEN-CENELEC Management Centre has the same status as the official versions.

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



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

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European foreword

This document (EN 12873-3:2019) 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 August 2019, and conflicting national standards shall be withdrawn at the latest by August 2019.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 12873-3:2006.

This document will result in one of a series of standards on test methods which support the appropriate standards, for products in contact with water intended for human consumption.

It has been drawn up with the objective to describe a test method to determine the migration of substances from ion exchange and absorbent resins.

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

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

Informative Annex B, describes a test apparatus.

Informative Annex C, provides information on resin pre-treatment.

This 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 factory-made products made from or incorporating organic or glassy (porcelain/vitreous enamel) materials;
- 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.

The major technical changes from EN 12873-3:2006 are:

- Introduction of a second sampling method
- Specification of a method of control of the test device

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

EN 12873-3:2019 (E)

Introduction

In respect of potential adverse effects on the quality of water intended for human consumption caused by materials, it should 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 document specifies a procedure to determine the migration of substances from ion exchange, adsorbent or hybrid resin materials for use in contact with water intended for human consumption.

Resins comprise synthetic organic macromolecular materials.

This 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;
- hybrid adsorbers: Organic polymer based ion exchange resin or adsorbent resin with incorporated inorganic (e.g. iron hydroxide) or second organic phase. Used to lower the concentration of undesirable substances (specific inorganic or organic pollutants) from water. They can be in either an anionic, cationic or neutral state.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

3.1

test

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

3.2

test procedure

specified technical method for performing a test

3.3

test report

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

3.4

testing laboratory

laboratory that performs tests

3.5

product

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

EN 12873-3:2019 (E)**3.6****test sample**

sample of a product submitted for testing

3.7**test water**

water for migration testing (5.2)

3.8**blank water**

test water (5.2) which has been kept at the same specified conditions as migration water (see Clause 9) but without contact with the test sample

3.9**migration**

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

3.10**bed volume (BV)**

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

3.11**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

3.12**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

3.13**cycling**

combination of exhaustion and regeneration

3.14**rinse**

washing process with specified medium

3.15**disinfection**

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

3.16**resin volume measurement**

mark placed on the test column, using water as a resin substitute, to indicate the volume of resin required (9.2.4 and 9.2.5)

4 Principle

If relevant, at the beginning of the test, the test sample is subjected to pre-treatment 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.

5 Reagents

5.1 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 Test Water

The test water shall be chlorine free water with a conductivity of $< 2\text{mS/m}$ 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.

5.3 Cleaning liquids for glassware

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

5.3.2 hydrochloric acid solution, prepared by slowly adding $(0,5 \pm 0,01) \text{ l}$ of concentrated hydrochloric acid (5.3.1) to $(0,5 \pm 0,01) \text{ l}$ of test water (5.1).

NOTE Care is needed because the solution may generate heat.

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

5.3.4 nitric acid solution, prepared by slowly adding $(0,5 \pm 0,01) \text{ l}$ of concentrated nitric acid (5.3.3) to $(0,5 \pm 0,01) \text{ l}$ of test water (5.2).

NOTE Care is needed because the solution may generate heat.

6 Apparatus

6.1 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 9).

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

It is recommended to have dedicated equipment.

NOTE It is advised not to use glass stoppers with grease.

6.2 Test apparatus. Specifications see Annex B. For any column used, the ratio of bed height (h) to bed diameter (d) shall be $5 \pm 0,3$ ($h/d = 5 \pm 0,3$).

6.3 Temperature control facility, such as a temperature-controlled laboratory, capable of maintaining the test apparatus at $(23 \pm 2) ^\circ\text{C}$.