SLOVENSKI STANDARD
SIST EN ISO 9696:2018

01-januar-2018

Nadomešča:
SIST ISO 9696:2010

Kakovost vode - Skupna alfa aktivnost - Preskusna metoda robustnega vira (ISO 9696:2017)

Water quality - Gross alpha activity - Test method using thick source (ISO 9696:2017)

Wasserbeschaffenheit - Gesamt-Alpha-Aktivität - Dickschichtverfahren (ISO 9696:2017)

Qualité de l'eau - Activité alpha globale - Méthode d'essai par source concentrée (ISO 9696:2017)

Ta slovenski standard je istoveten z: EN ISO 9696:2017

ICS:

13.060.60	Preiskava fizikalnih lastnosti vode	Examination of physical properties of water
17.240	Merjenje sevanja	Radiation measurements

SIST EN ISO 9696:2018 **en,fr,de**

EUROPEAN STANDARD

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November 2017

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English Version

Water quality - Gross alpha activity - Test method using thick source (ISO 9696:2017)

Qualité de l'eau - Activité alpha globale - Méthode d'essai par source concentrée (ISO 9696:2017)

Wasserbeschaffenheit - Gesamt-Alpha-Aktivität - Dickschichtverfahren (ISO 9696:2017)

This European Standard was approved by CEN on 19 September 2017.

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

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

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European foreword

This document (EN ISO 9696:2017) has been prepared by Technical Committee ISO/TC 147 "Water quality" in collaboration with Technical Committee CEN/TC 230 “Water analysis” the secretariat of which is held by DIN.

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of an identical text or by endorsement, at the latest by May 2018 and conflicting national standards shall be withdrawn at the latest by May 2018.

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.

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Endorsement notice

The text of ISO 9696:2017 has been approved by CEN as EN ISO 9696:2017 without any modification.

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Water quality — Gross alpha activity — Test method using thick source

Qualité de l'eau — Activité alpha globale — Méthode d'essai par source concentrée

ISO/CEN PARALLEL PROCESSING

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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 147, *Water quality*, Subcommittee SC 3, *Radioactivity measurements*.

This third edition cancels and replaces the second edition (ISO 9696:2007), which has been technically revised.

Introduction

Radioactivity from several naturally occurring and anthropogenic sources is present throughout the environment. Thus, water bodies (e.g. surface waters, ground waters, sea waters) can contain radionuclides of natural, human-made or of both origins:

— natural radionuclides, including ^{40}K, ^{3}H, ^{14}C, and those originating from the thorium and uranium decay series, in particular ^{226}Ra, ^{228}Ra, ^{234}U, ^{238}U, ^{210}Po and ^{210}Pb, can be found in water for natural reasons (e.g. desorption from the soil and runoff by rain water) or can be released from technological processes involving naturally occurring radioactive materials (e.g. the mining and processing of mineral sands or phosphate fertilizers production and use);

— anthropogenic radionuclides, such as the transuranium elements (e.g. americium, plutonium, neptunium and curium), ^{3}H, ^{14}C, ^{90}Sr, and some gamma-emitting radionuclides can also be found in natural waters. Small quantities of these radionuclides may be discharged from nuclear fuel cycle facilities into the environment as the result of authorized routine releases. Some of these radionuclides used for medical and industrial applications may also be released into the environment after use. Anthropogenic radionuclides are also found in waters as the result of past fallout contamination resulting from the above ground detonation of nuclear devices and accidents such as those that occurred in Chernobyl and Fukushima.

Radionuclide activity concentration in water bodies can vary according to local geological characteristics and climatic conditions and can be locally and temporally enhanced by releases from nuclear installation during planned, existing and emergency exposure situations[1]. Drinking water may thus contain radionuclides at activity concentrations which could present a risk to human health.

The radionuclides present in liquid effluents are usually controlled before being discharged into the environment[2] and water bodies. Drinking water may be monitored for their radioactivity as recommended by the World Health Organization (WHO)[3]. Such control and monitoring can enable to take proper actions to ensure that there is no adverse health effects to the public. Following these international recommendations, radionuclide authorized concentration limits for liquid effluent discharged to the environment and radionuclide guidance levels for water bodies and drinking water are usually specified by national regulations for planned, existing and emergency exposure situations. Compliance with these limits can be assessed using measurement results with their associated uncertainties as requested by ISO/IEC Guide 98-3 and ISO 5667-20.

Depending on the exposure situation, the limits and guidance levels that would result in an action to reduce health risk differ. As an example, during planned or existing situation, the WHO guidance for screening levels in drinking water is 0,5 Bq/l for gross alpha activity and 1 Bq/l for gross beta activity.

NOTE The guidance level is the activity concentration with an intake of 2 l/d of drinking water for 1 year that results in an effective dose of 0,1 mSv/a for members of the public, an effective dose that represents a very low level of risk that is not expected to give rise to any detectable adverse health effect[3].

Thus, the test method may need to be adjusted depending if it is applied for either a planned-existing or an emergency situation since during emergency situations, a large number of samples needs to be rapidly characterized. The test methods could be adapted so that its performance in term of characteristic limits, decision threshold and detection limit, and the uncertainties ensure that the gross activity concentration test results permit the verification that they are below the guidance levels required by national authority for either planned-existing situations or an emergency situation[5][6][7].

Usually, the test methods can be adjusted to measure the gross activity concentration of the radionuclide(s) in either wastewaters before storage or in liquid effluents before being discharged to the environment. The test results will enable the plant/installation operator to comply with national regulations in verifying that before their discharge, wastewaters/liquid effluent radioactive activity concentrations are lower than the authorized limits.

The test method(s) described in this document may be used during planned, existing and emergency exposure situations, as well as for wastewaters and liquid effluents with specific modifications that could increase the overall uncertainty, detection limit and threshold.