
**Kakovost vode - Radon Rn-222 - 2. del: Preskusna metoda z gama spektrometrijo
(ISO/DIS 13164-2:2026)**

Water quality - Radon-222 - Part 2: Test method using gamma-ray spectrometry
(ISO/DIS 13164-2:2026)

Wasserbeschaffenheit - Radon-222 - Teil 2: Verfahren mittels Gammaspektrometrie
(ISO/DIS 13164-2:2026)

Qualité de l'eau - Radon 222 - Partie 2: Méthode d'essai par spectrométrie gamma
(ISO/DIS 13164-2:2026)

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ICS:

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17.240	Merjenje sevanja	Radiation measurements

oSIST prEN ISO 13164-2:2026**en,fr,de**

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ISO/DIS 13164-2

Water quality — Radon-222 — Part 2: Test method using gamma-ray spectrometry

Qualité de l'eau — Radon 222 —

Partie 2: Méthode d'essai par spectrométrie gamma

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Contents

Page

Foreword	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Terms and definitions	2
4 Symbols	2
5 Principle	3
6 Sampling	4
6.1 General requirement	4
6.2 Sampling requirement	4
6.3 Sample volume	4
6.4 Container characteristics	4
7 Transportation and storage	4
8 Detection	5
9 Measurement procedure	5
10 Quality assurance and quality control programme	5
10.1 General	5
10.2 Influence quantities	5
10.3 Instrument verification	6
10.4 Method verification	6
10.5 Demonstration of analyst capability	7
11 Expression of results	7
11.1 Activity concentration	7
11.2 Standard uncertainty of the activity concentration	7
11.3 Decision threshold	8
11.4 Limit of detection	8
11.5 Limits of the coverage intervals	9
11.5.1 Limits of the probabilistically symmetric coverage interval	9
11.5.2 The shortest coverage interval	9
12 Calibration	9
13 Test report	10
Annex A (informative) Sample spectra	11
Annex B (informative) Sample accuracy and precision data	13
Bibliography	14

ISO/DIS 13164-2:2026(en)

Foreword

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

This second edition cancels and replaces the first edition (ISO 13164-2:2013), which has been technically revised.

The main changes are as follows:

- A common Introduction template for the ISO 13164 series parts under revision was implemented
- Edits to improve consistency with content of other ISO 13164 parts
- Updates to Symbols clause content
- Clarified decay correction calculations
- Annex and Bibliography updates
- Additional clarifying edits.

A list of all parts in the ISO 13164 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

ISO/DIS 13164-2:2026(en)

Introduction

Radionuclides are present throughout the environment; thus, water bodies (e.g. surface waters, ground waters, sea waters) contain radionuclides, which can be of either natural or anthropogenic origin:

- naturally occurring radionuclides, including ^3H , ^{14}C , ^{40}K and those originating from the thorium and uranium decay series, in particular ^{210}Pb , ^{210}Po , ^{222}Rn , ^{226}Ra , ^{228}Ra , ^{227}Ac , ^{232}Th , ^{231}Pa , ^{234}U , and ^{238}U can be found in water bodies due to either natural processes (e.g., desorption from the soil, runoff by rain water) or released from technological processes involving naturally occurring radioactive materials (e.g. mining, mineral processing, oil, gas and production, water treatment and the production and the use of phosphate fertilisers);
- anthropogenic radionuclides such as ^{55}Fe , ^{59}Ni , ^{63}Ni , ^{90}Sr , ^{99}Tc , transuranic elements (Np, Pu, Am, and Cm) and some gamma emitting radionuclides such as ^{60}Co and ^{137}Cs can also be found in natural waters. Small quantities of anthropogenic radionuclides can be discharged from nuclear facilities to the environment as a result of authorized routine releases. The radionuclides present in liquid effluents are usually controlled before being discharged to the environment^[1] and water bodies. Anthropogenic radionuclides used in medical and industrial applications can be released to the environment after use. Anthropogenic radionuclides are also found in waters due to the contamination from fallout resulting above-ground nuclear detonations and accidents such as those that occurred at the Chornobyl and Fukushima nuclear facilities.

Radionuclide activity concentrations in water bodies can vary according to local geological characteristics and climatic conditions and can be locally and temporally enhanced by releases from nuclear facilities during planned, existing, and emergency exposure situations^{[2][3]}. Some drinking water sources can thus contain radionuclides at activity concentrations that could present a human health risk. The World Health Organization (WHO) recommends to routinely monitor radioactivity in drinking waters^[4] and to take proper actions when needed to minimize the health risk.

National regulations usually specify the activity concentration limits that are authorized in drinking waters, water bodies, and liquid effluents to be discharged to the environment. These limits can vary for planned, existing, and emergency exposure situations. The WHO does not have a current recommended specific activity concentration limit for radon in water as radon exposure through indoor air is considered a more pressing concern,^[4] while in Europe, the implementation of European Council Directive 2013/51/EURATOM, establishes a radon concentration limit of 100 Bq·l⁻¹. Compliance with such limits is assessed by measuring radioactivity in water samples and by comparing the results obtained with their associated uncertainties as specified by ISO/IEC Guide 98-3^[5] and ISO 5667-20^[6].

This document contains method to support laboratories which need to determine ^{222}Rn in water samples.

The method described in this document can be used for various types of waters (see [Clause 1](#)). Minor modifications such as sample volume and counting time can be made if needed to ensure that the characteristic limit, decision threshold, detection limit, and uncertainties are below the required limits. This can be done for several reasons such as emergency situations, lower national guidance limits, and operational requirements.