



SLOVENSKI STANDARD SIST EN ISO 18589-1:2021

01-oktober-2021

Merjenje radioaktivnosti v okolju - Tla - 1. del: Splošne smernice in definicije (ISO 18589-1:2019)

Measurement of radioactivity in the environment - Soil - Part 1: General guidelines and definitions (ISO 18589-1:2019)

Ermittlung der Radioaktivität in der Umwelt - Erdboden - Teil 1: Allgemeine Leitlinien und Begriffe (ISO 18589-1:2019)

Mesurage de la radioactivité dans l'environnement - Sol - Partie 1: Lignes directrices générales et définitions (ISO 18589-1:2019)

<https://standards.iteh.ai/catalog/standards/sist/fl0497a6-2f5a-4183-8c00-39b5e501211b/sist-en-iso-18589-1-2021>

Ta slovenski standard je istoveten z: **EN ISO 18589-1:2021**

ICS:

13.080.99	Drugi standardi v zvezi s kakovostjo tal	Other standards related to soil quality
17.240	Merjenje sevanja	Radiation measurements

SIST EN ISO 18589-1:2021

en,fr,de

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN ISO 18589-1:2021](https://standards.iteh.ai/catalog/standards/sist/fl0497a6-2f5a-4183-8c00-39b5c501211b/sist-en-iso-18589-1-2021)

<https://standards.iteh.ai/catalog/standards/sist/fl0497a6-2f5a-4183-8c00-39b5c501211b/sist-en-iso-18589-1-2021>

EUROPEAN STANDARD

EN ISO 18589-1

NORME EUROPÉENNE

EUROPÄISCHE NORM

August 2021

ICS 13.080.01; 17.240

English Version

Measurement of radioactivity in the environment - Soil - Part 1: General guidelines and definitions (ISO 18589- 1:2019)

Mesurage de la radioactivité dans l'environnement -
Sol - Partie 1: Lignes directrices générales et
définitions (ISO 18589-1:2019)

Ermittlung der Radioaktivität in der Umwelt -
Erdboden - Teil 1: Allgemeine Leitlinien und Begriffe
(ISO 18589-1:2019)

This European Standard was approved by CEN on 25 July 2021.

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.

iTeh STANDARD PREVIEW

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, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.



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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

Contents	Page
European foreword.....	3

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN ISO 18589-1:2021](https://standards.iteh.ai/catalog/standards/sist/fl0497a6-2f5a-4183-8c00-39b5c501211b/sist-en-iso-18589-1-2021)
<https://standards.iteh.ai/catalog/standards/sist/fl0497a6-2f5a-4183-8c00-39b5c501211b/sist-en-iso-18589-1-2021>

European foreword

The text of ISO 18589-1:2019 has been prepared by Technical Committee ISO/TC 85 "Nuclear energy, nuclear technologies, and radiological protection" of the International Organization for Standardization (ISO) and has been taken over as EN ISO 18589-1:2021 by Technical Committee CEN/TC 430 "Nuclear energy, nuclear technologies, and radiological protection" 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 February 2022, and conflicting national standards shall be withdrawn at the latest by February 2022.

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.

Any feedback and questions on this document should be directed to the users' national standards body. A complete listing of these bodies can be found on the CEN website.

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

(standards.iteh.ai)

Endorsement notice

[SIST EN ISO 18589-1:2021](https://standards.iteh.ai/catalog/standards/sist/f10497a6-2f5a-4183-8c00-3965c501211b/sist-en-iso-18589-1-2021)

The text of ISO 18589-1:2019 has been approved by CEN as EN ISO 18589-1:2021 without any modification.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN ISO 18589-1:2021](#)

<https://standards.iteh.ai/catalog/standards/sist/fl0497a6-2f5a-4183-8c00-39b5c501211b/sist-en-iso-18589-1-2021>

INTERNATIONAL
STANDARD

ISO
18589-1

Second edition
2019-11

**Measurement of radioactivity in the
environment — Soil —**

**Part 1:
General guidelines and definitions**

Mesurage de la radioactivité dans l'environnement — Sol —

Partie 1: Lignes directrices générales et définitions

**iTeh STANDARD PREVIEW
(standards.iteh.ai)**

[SIST EN ISO 18589-1:2021](https://standards.iteh.ai/catalog/standards/sist/fl0497a6-2f5a-4183-8c00-39b5c501211b/sist-en-iso-18589-1-2021)

<https://standards.iteh.ai/catalog/standards/sist/fl0497a6-2f5a-4183-8c00-39b5c501211b/sist-en-iso-18589-1-2021>



Reference number
ISO 18589-1:2019(E)

© ISO 2019

iTeh STANDARD PREVIEW (standards.iteh.ai)

[SIST EN ISO 18589-1:2021](https://standards.iteh.ai/catalog/standards/sist/fl0497a6-2f5a-4183-8c00-39b5c501211b/sist-en-iso-18589-1-2021)

<https://standards.iteh.ai/catalog/standards/sist/fl0497a6-2f5a-4183-8c00-39b5c501211b/sist-en-iso-18589-1-2021>



COPYRIGHT PROTECTED DOCUMENT

© ISO 2019

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Fax: +41 22 749 09 47
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

Page

Foreword	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Terms and definitions	2
3.1 General terms.....	2
3.2 Terms relating to soils.....	2
3.3 Terms relating to sampling.....	3
4 Symbols	5
5 Origins of the radioactivity in soils	5
5.1 Natural radioactivity.....	5
5.2 Other sources of radioactivity in soils.....	6
6 Objectives of the study of soil radioactivity	6
6.1 General.....	6
6.2 Characterization of radioactivity in the environment.....	6
6.3 Routine surveillance of the impact of nuclear installations or of the evolution of the general territory.....	7
6.4 Investigations of accident and incident situations.....	7
6.5 Planning and surveillance of remedial action.....	7
6.6 Decommissioning of installations or clearance of materials.....	7
7 Principles and requirements of the study of soil radioactivity	8
7.1 General.....	8
7.2 Planning process — Sampling strategy and plan.....	9
7.3 Sampling process.....	9
7.4 Laboratory process.....	10
7.4.1 Preparation of samples.....	10
7.4.2 Radioactivity measurements.....	10
7.5 General procedural requirements.....	11
7.6 Documentation.....	12
Bibliography	13

ISO 18589-1:2019(E)**Foreword**

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

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).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of 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 www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 85, *Nuclear energy, nuclear technologies and radiological protection*, Subcommittee SC 2, *Radiological protection*.

This second edition cancels and replaces the first edition (ISO 18589-1:2005), which has been technically revised.

The main change compared to the previous edition is as follows:

- The introduction has been reviewed accordingly to the generic introduction adopted for the standards published on the radioactivity measurement in the environment.

A list of all parts in the ISO 18589 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

Introduction

Everyone is exposed to natural radiation. The natural sources of radiation are cosmic rays and naturally occurring radioactive substances which exist in the earth and flora and fauna, including the human body. Human activities involving the use of radiation and radioactive substances add to the radiation exposure from this natural exposure. Some of those activities, such as the mining and use of ores containing naturally-occurring radioactive materials (NORM) and the production of energy by burning coal that contains such substances, simply enhance the exposure from natural radiation sources. Nuclear power plants and other nuclear installations use radioactive materials and produce radioactive effluent and waste during operation and decommissioning. The use of radioactive materials in industry, agriculture and research is expanding around the globe.

All these human activities give rise to radiation exposures that are only a small fraction of the global average level of natural exposure. The medical use of radiation is the largest and a growing man-made source of radiation exposure in developed countries. It includes diagnostic radiology, radiotherapy, nuclear medicine and interventional radiology.

Radiation exposure also occurs as a result of occupational activities. It is incurred by workers in industry, medicine and research using radiation or radioactive substances, as well as by passengers and crew during air travel. The average level of occupational exposures is generally below the global average level of natural radiation exposure (see Reference [1]).

As uses of radiation increase, so do the potential health risk and the public's concerns. Thus, all these exposures are regularly assessed in order to:

- improve the understanding of global levels and temporal trends of public and worker exposure;
- evaluate the components of exposure so as to provide a measure of their relative importance;
- identify emerging issues that may warrant more attention and study. While doses to workers are mostly directly measured, doses to the public are usually assessed by indirect methods using the results of radioactivity measurements of waste, effluent and/or environmental samples.

To ensure that the data obtained from radioactivity monitoring programs support their intended use, it is essential that the stakeholders (for example nuclear site operators, regulatory and local authorities) agree on appropriate methods and procedures for obtaining representative samples and for handling, storing, preparing and measuring the test samples. An assessment of the overall measurement uncertainty also needs to be carried out systematically. As reliable, comparable and 'fit for purpose' data are an essential requirement for any public health decision based on radioactivity measurements, international standards of tested and validated radionuclide test methods are an important tool for the production of such measurement results. The application of standards serves also to guarantee comparability of the test results over time and between different testing laboratories. Laboratories apply them to demonstrate their technical competences and to complete proficiency tests successfully during interlaboratory comparisons, two prerequisites for obtaining national accreditation.

Today, over a hundred International Standards are available to testing laboratories for measuring radionuclides in different matrices.

Generic standards help testing laboratories to manage the measurement process by setting out the general requirements and methods to calibrate equipment and validate techniques. These standards underpin specific standards which describe the test methods to be performed by staff, for example, for different types of sample. The specific standards cover test methods for:

- naturally-occurring radionuclides (including ^{40}K , ^3H , ^{14}C and those originating from the thorium and uranium decay series, in particular ^{226}Ra , ^{228}Ra , ^{234}U , ^{238}U and ^{210}Pb) which can be found in materials from natural sources or can be released from technological processes involving naturally occurring radioactive materials (e.g. the mining and processing of mineral sands or phosphate fertilizer production and use);