SLOVENSKI STANDARD
SIST EN ISO 11665-3:2015

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Merjenje radioaktivnosti v okolju - Zrak: radon-222 - 3. del: Točkovna metoda za merjenje potencialne koncentracije alfa energije njegovih kratkoživih razpadnih produktov (ISO 11665-3:2012)

Measurement of radioactivity in the environment - Air: radon-222 - Part 3: Spot measurement method of the potential alpha energy concentration of its short-lived decay products (ISO 11665-3:2012)

Ermittlung der Radioaktivität in der Umwelt - Luft: Radon-222 - Teil 3: Punktmessverfahren der potenziellen Alpha-Energiekonzentration der kurzlebigen Radon-Folgeprodukte (ISO 11665-3:2012)

Mesurage de la radioactivité dans l'environnement - Air: radon 222 - Partie 3: Méthode de mesure ponctuelle de l'énergie alpha potentielle volumique de ses descendants à vie courte (ISO 11665-3:2012)

Ta slovenski standard je istoveten z: EN ISO 11665-3:2015

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13.040.99	Drugi standardi v zvezi s kakovostjo zraka	Other standards related to air quality
17.240	Merjenje sevanja	Radiation measurements

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EUROPEAN STANDARD

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English Version

Measurement of radioactivity in the environment - Air: radon-222 - Part 3: Spot measurement method of the potential alpha energy concentration of its short-lived decay products (ISO 11665-3:2012)

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COMITÉ EUROPÉEN DE NORMALISATION
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European foreword

The text of ISO 11665-3:2012 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 11665-3:2015 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of an identical text or by endorsement, at the latest by March 2016, and conflicting national standards shall be withdrawn at the latest by March 2016.

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Endorsement notice

The text of ISO 11665-3:2012 has been approved by CEN as EN ISO 11665-3:2015 without any modification.

INTERNATIONAL STANDARD

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Measurement of radioactivity in the environment — Air: radon-222 —

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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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ISO 11665-3 was prepared by Technical Committee ISO/TC 85, *Nuclear energy, nuclear technologies, and radiological protection*, Subcommittee SC 2, *Radiological protection*.

ISO 11665 consists of the following parts, under the general title *Measurement of radioactivity in the environment — Air: radon-222*:

— *Part 1: Origins of radon and its short-lived decay products and associated measurement methods*

— *Part 2: Integrated measurement method for determining average potential alpha energy concentration of its short-lived decay products*

— *Part 3: Spot measurement method of the potential alpha energy concentration of its short-lived decay products*

— *Part 4: Integrated measurement method for determining average activity concentration using passive sampling and delayed analysis*

— *Part 5: Continuous measurement method of the activity concentration*

— *Part 6: Spot measurement method of the activity concentration*

— *Part 7: Accumulation method for estimating surface exhalation rate*

— *Part 8: Methodologies for initial and additional investigations in buildings*

The following parts are under preparation:

— *Part 9: Method for determining exhalation rate of dense building materials*

— *Part 10: Determination of diffusion coefficient in waterproof materials using activity concentration measurement*

Introduction

Radon isotopes 222, 220 and 219 are radioactive gases produced by the disintegration of radium isotopes 226, 224 and 223, which are decay products of uranium-238, thorium-232 and uranium-235 respectively, and are all found in the earth's crust. Solid elements, also radioactive, followed by stable lead are produced by radon disintegration[1].

When disintegrating, radon emits alpha particles and generates solid decay products, which are also radioactive (polonium, bismuth, lead, etc.). The potential effects on human health of radon lie in its solid decay products rather than the gas itself. Whether or not they are attached to atmospheric aerosols, radon decay products can be inhaled and deposited in the bronchopulmonary tree to varying depths according to their size.

Radon is today considered to be the main source of human exposure to natural radiation. The UNSCEAR (2006) report[2] suggests that, at the worldwide level, radon accounts for around 52 % of global average exposure to natural radiation. The radiological impact of isotope 222 (48 %) is far more significant than isotope 220 (4 %), while isotope 219 is considered negligible. For this reason, references to radon in this part of ISO 11665 refer only to radon-222.

Radon activity concentration can vary by one to multiple orders of magnitude over time and space. Exposure to radon and its decay products varies tremendously from one area to another, as it depends firstly on the amount of radon emitted by the soil and the building materials in each area and, secondly, on the degree of containment and weather conditions in the areas where individuals are exposed.

Variations of a few nanojoules per cubic metre to several thousand nanojoules per cubic metre are observed in the potential alpha energy concentration of short-lived radon decay products.

The potential alpha energy concentration of short-lived radon-222 decay products in the atmosphere can be measured by spot and integrated measurement methods (see ISO 11665-1 and ISO 11665-2). This part of ISO 11665 deals with spot measurement methods. A spot measurement of the potential alpha energy concentration relates to the time when the measurement is taken and has no significance in annual exposure. This type of measurement does not therefore apply when assessing the annual exposure.

NOTE The origin of radon-222 and its short-lived decay products in the atmospheric environment and other measurement methods are described generally in ISO 11665-1.