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RADIOAKTIIVSUSE MÕÕTMINE KESKKONNAS. ÕHK: RADOON-222. OSA 6: AKTIIVSUSKONTSENTRATSIOONI KOHTMÕÕTMISE MEETOD

Measurement of radioactivity in the environment - Air: radon-222 - Part 6: Spot measurement method of the activity concentration (ISO 11665-6:2012)

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See Eesti standard EVS-EN ISO 11665-6:2015 sisaldab Euroopa standardi EN ISO 11665-6:2015 ingliskeelset teksti.	This Estonian standard EVS-EN ISO 11665-6:2015 consists of the English text of the European standard EN ISO 11665-6:2015.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas.	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 16.09.2015.	Date of Availability of the European standard is 16.09.2015.
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ICS 13.040.01, 17.240

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN ISO 11665-6

September 2015

ICS 13.040.01; 17.240

English Version

Measurement of radioactivity in the environment - Air: radon-222 - Part 6: Spot measurement method of the activity concentration (ISO 11665-6:2012)

Mesurage de la radioactivité dans l'environnement - Air: radon 222 - Partie 6: Méthode de mesure ponctuelle de l'activité volumique (ISO 11665-6:2012)

Ermittlung der Radioaktivität in der Umwelt - Luft: Radon-222 - Teil 6: Punktmessverfahren für die Aktivitätskonzentration (ISO 11665-6:2012)

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European foreword

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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of an identical text or by endorsement, at the latest by March 2016, and conflicting national standards shall be withdrawn at the latest by March 2016.

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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.

The values commonly found in the continental environment are usually between a few becquerels per cubic metre and several thousand becquerels per cubic metre. Activity concentrations of one becquerel per cubic metre or less can be observed in the oceanic environment. Radon activity concentrations inside houses may vary from several tens of becquerels per cubic metre to several hundreds of becquerels per cubic metre[3]. Activity concentrations can reach several thousands of becquerels per cubic metre in very confined spaces.

The activity concentration of radon-222 in the atmosphere can be measured by spot, continuous and integrated measurement methods with active or passive air sampling (see ISO 11665-1). This part of ISO 11665 deals with radon-222 spot measurement methods.

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.

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

Part 6: Spot measurement method of the activity concentration

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1 Scope

This part of ISO 11665 describes radon-222 spot measurement methods. It gives indications for carrying out spot measurements, at the scale of a few minutes at a given place, of the radon activity concentration in open and confined atmospheres.

This measurement method is intended for rapid assessment of the radon activity concentration in the air. The result cannot be extrapolated to an annual estimate of the radon activity concentration. This type of measurement is therefore not applicable for assessment of the annual exposure.

The measurement method described is applicable to air samples with radon activity concentration greater than 50 Bq/m^3.

NOTE For example, using an appropriate device, the radon activity concentration can be spot measured in the soil and at the interface of a material with the atmosphere (see also ISO 11665-7).

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 11665-1, *Measurement of radioactivity in the environment — Air: radon-222 — Part 1: Origins of radon and its short-lived decay products and associated measurement methods*

ISO 11929, *Determination of the characteristic limits (decision threshold, detection limit and limits of the confidence interval) for measurements of ionizing radiation — Fundamentals and application*

ISO/IEC 17025, *General requirements for the competence of testing and calibration laboratories*

IEC 61577-1, *Radiation protection instrumentation — Radon and radon decay product measuring instruments — Part 1: General principles*

3 Terms, definitions and symbols

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 11665-1 apply.

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