IEC 61577-6

Edition 1.0 2026-03

INTERNATIONAL STANDARD

**Radiation protection instrumentation - Radon and radon decay product measuring instruments -
Part 6: Passive integrating radon measurement system using solid-state nuclear track detectors**

ICS 13.280

ISBN 978-2-8327-1109-5

IEC 61577-6:2026-03(en)

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Radiation protection instrumentation - Radon and radon decay product measuring instruments - Part 6: Passive integrating radon measurement system using solid-state nuclear track detectors

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IEC 61577-6 has been prepared by subcommittee 45B: Radiation protection instrumentation, of IEC technical committee 45: Nuclear instrumentation. It is an International Standard.

The text of this International Standard is based on the following documents:

Draft	Report on voting
45B/1100/FDIS	45B/1111/RVD

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

A list of all parts in the IEC 61577 series, published under the general title *Radiation protection instrumentation - Radon and radon decay product measuring instruments*, can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

– reconfirmed,

– withdrawn, or

– revised.

INTRODUCTION

Radon is a radioactive gas produced by the decay of ^{226}Ra, ^{223}Ra and ^{224}Ra, respectively decay products of ^{238}U, ^{235}U and ^{232}Th, which are present in the earth's crust. By decay, radon isotopes (i.e. ^{222}Rn, ^{219}Rn, ^{220}Rn) produce three decay chains ending in a stable lead isotope.

In normal conditions, due to the very short half-life of ^{219}Rn, its activity and the activity of its Radon Decay Products (RnDP)[1] are considered negligible compared to the activity of the two other series. Its health effects are therefore not important. Thus, in this document ^{219}Rn and its decay products are not considered.

Radon isotopes and their corresponding short-lived RnDP (i.e. ^{218}Po, ^{214}Pb, ^{214}Bi, ^{214}Po for ^{222}Rn, and ^{216}Po, ^{212}Pb, ^{212}Bi, ^{212}Po, ^{208}Tl for ^{220}Rn) are of considerable importance, as they constitute the major part of the radiological exposure to natural radioactivity for the general public and workers. In some workplaces, for instance in underground mines, spas and waterworks, the workers can be exposed to very significant levels of RnDP. The conformity of the technical characteristics of radon measuring devices with specific requirements contributes to a harmonized quality level of the measurements and thus supports the confidence in the measurement results and the acceptance of the decisions made.

Remark:

In order to facilitate its use, the IEC 61577 series is divided into the following different parts:

IEC 61577-1: This emphasizes the terminology and units of the specific field of radon and radon decay products (RnDP) measurement techniques and presents briefly the concept of System for Test Atmospheres with Radon (STAR) used for test and calibration of radon and RnDP measuring devices.

IEC 61577-2 [1][2]: This part is dedicated to the tests of ^{222}Rn and ^{220}Rn measuring instruments.

IEC 61577-3 [2]: This part is dedicated to the tests of $RnDP_{222}$ and $RnDP_{220}$ measuring instruments.

IEC 61577-4 [3]: This part details how a STAR is constructed and how it can be used for testing.

IEC TR 61577-5 [4]: This part provides basic data and technical information to support the design of measuring instruments for ^{222}Rn, ^{220}Rn and their decay products and practical application of the instruments for the measurement.

IEC 61577-6: This part is dedicated to the tests of passive integrating ^{222}Rn measurement systems.

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1 RnDP is the acronym of Radon Decay Products and it is equivalent to Radon Progeny.

2 Numbers in square brackets refer to the Bibliography.