

ICS 13.280

CCS F 84



**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 13163.3-2014

**Radiation protection instrumentation -- Radon and radon decay
product measuring instruments -- Part 3: Specific requirements
for radon decay product measuring instruments**

辐射防护仪器 氡及氡子体测量仪 第3部分：氡子体测量仪的特殊要求

(English Translation)

Issued on: September 3, 2014

Implemented on: February 1, 2015

Issued by: Standardization Administration of China

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Foreword

GB/T 13163 "Radiation protection instrumentation - Radon and radon measuring instrument" is divided into four parts.

- Part 1. General principles;
- Part 2. Particular requirements for radon measuring instruments;
- Part 3. radon measuring instruments special requirements;
- Part 4. generating device containing radon isotopes and their daughters reference atmosphere (radon test system).

This section GB/T 13163 Part 3.

This section drafted in accordance with GB/T 1.1-2009 given rules.

This section uses the translation method is equivalent to using IEC 61577-3:2011 "Radiation protection instrumentation - Radon and radon measuring instruments Part 3. Radon Particular requirements daughter meter. " Consistency correspondence with international standards in this part of the country cited the following documents.

- GB/T 2423.5-1995 Environmental testing for electric and electronic products Part 2. Test methods Test Ea and guidance. Shock (Idt IEC 60068-2-27. 1987);
- GB 17799.4-2012 Electromagnetic compatibility - Generic standards Emission standard for industrial environments (IEC 61000-6-4:2011, IDT);
- GB/T 16511-1996 Electrical and electronic measuring equipment - Documentation (idt IEC 61187:1993).

For ease of use, this section of IEC 61577-3:2011 made the following editorial changes.

- "2 Normative references" to increase the GB/T 13163.1-2009;
- "3 Terms and definitions" increase "for ease of use, repeat the following list of IEC 60050-394 some terms and definitions Righteousness ";
- Remove 10.2 and Table 3 does not meet the conditions of the mains frequency content;
- Table 1, footnote number with a, b, c instead of *, **, ***, Table 2 and Table 3, footnote number with a, b instead of *, **.

This part of the National Nuclear Instrument Standardization Technical Committee (SAC/TC30) and focal points.

This section drafted by. China Institute of Atomic Energy.

Introduction

Radon is a radioactive trace gases, the earth's crust are radioactive series of natural radionuclides ^{238}U , ^{235}U and ^{232}Th daughter of ^{226}Ra , ^{223}Ra and ^{224}Ra decay produced. Isotopes of radon (^{222}Rn , ^{219}Rn and ^{220}Rn) by three decay chain decay, and finally terminates in the stable lead with Isotope. Isotopes of radon and thoron ^{220}Rn commonly referred to as 1).

Note: Under normal circumstances, due to the very short half-life of ^{219}Rn , compared with the two other series of radon activity, its activity and decay daughters (RnDP2) activity can be ignored, its health effects are not important. Therefore, in this part of ^{219}Rn and its decay daughters is not considered.

Radon decay of short-lived isotopes and their respective daughters (RnDP) (for example, ^{222}Rn of ^{218}Po , ^{214}Pb , ^{214}Bi , ^{214}Po , ^{220}Rn of ^{216}Po , ^{212}Pb , ^{212}Bi , ^{212}Po , ^{208}Tl) is very important, as they form public and occupational radiation exposure of staff to accept the natural home to section. In some people the workplace (for example, underground mine, mineral water and waterworks) work by a very significant level of radon Exposure. Radon is a gas and its isotopes and their daughter are fine particles of these different amounts of airborne radionuclides are present in the form. High accuracy Measurement of natural radioactivity in the atmosphere of this level for health physics is valuable. Since these radioactive elements in the air and in phase the measuring instrument should have unique behavioral characteristics, it is necessary to test methods for measuring instruments such norms.

GB/T 13163 series of standards, including radon and radon testing and calibration of measuring instruments special requirements in order to facilitate application, GB/T 13163 Series of standards are divided into the following different parts.

GB/T 13163.1 (normative). This section relates specializes in radon and radon (RnDP) The term measurements with the unit, briefly RnDP for radon measurement and test equipment and calibration of radon test system (STAR).

GB/T 13163.2 (normative). This section is dedicated to ^{222}Rn and ^{220}Rn meter test.

GB/T 13163.3 (normative). This section is dedicated to the ^{222}Rn and ^{220}Rn daughters (RnDP222 and RnDP220) meter test.

GB/T 13163.4 (normative). This section details the structure and application of the STAR test.

GB/T 13163.5 (informative). This part is about the characteristics of radon and its daughters and technical guidelines of the measure.

1) This section does not use the term thoron, radon represents nuclides ^{220}Rn and ^{222}Rn . Especially when a particular radionuclide, marked its chemical symbol and mass number.

2) RnDP is an acronym for radon decay products, sometimes represented by radon daughters. Radon decay products or its abbreviation RnDP refers to this section concern radon decay all short-lived progeny. For a particular daughter isotopes in the upper left corner plus the quality of its chemical symbol numbers. Symbol RnDP plus right the subscript numbers (222,220) refers to the corresponding isotopes of radon daughters all. (For example, RnDP222 means of 222Rn daughters 218Po, 214Pb, 214Bi, 214Po, RnDP220 means of 220Rn daughters 216Po, 212Pb, 212Bi, 212Po, 208Tl).

Radiation protection instrumentation - Radon and radon measuring instrument Part 3.
Particular requirements for radon measuring instruments

1 Scope

GB/T 13163 provisions of this part of the measure outdoor, residential and workplace (including underground mines) in the air carrier's short-lived radon daughters Product activity and/or special environmental requirements alpha potential concentration of the instrument.

This section applies to crawl based on sampling, continuous sampling measurement technology and electronic integration of almost all types of electronic equipment. Correct Activity measurement sampling means (such as filters) can be performed on or after sampling during the sampling period is completed.

GB/T 13163.1-2009 laid down in the various types of instruments used to measure.

2 Normative references

The following documents for the application of this document is essential. For dated references, only the dated version suitable for use herein Member. For undated references, the latest edition (including any amendments) applies to this document.

IEC 60050-394 International Electrotechnical Vocabulary (IEV) - Part 394. Nuclear instrumentation equipment, systems, equipment and detectors
(Internationalelectrotechnicalvocabulary (IEV) -Part 394.
Nuclearinstrumentation-Instruments, systems, equipmentanddetectors) IEC 60068-2-27
Environmental testing Part 2-27. Tests - Test Ea and guidance. Shock
(Environmentaltesting-Part 2-27. Tests-TestEaandguidance. Shock) IEC 61000-6-4
Electromagnetic compatibility (EMC) Part 6-4. Generic standards Emission standard for industrial environments (Electromag-neticcompatibility (EMC) -Part 6-4.
Genericstandards-Emissionstandardforindustrialenviron-ments) - General IEC 61140
Protection against electric shock devices and equipment
(Protectionagainstelectricshock-Commonas-pectsforinstalationandequipment) IEC 61187
Electrical and electronic measuring equipment - Documentation
(Electricalandelectronicmeasuringequipment-Documentation) ISO/IEC Guide 98-3.2008