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

GB/T 14055.3-2026

**Neutron reference radiation - Part 3: Calibration of area and
personal dosimeters and determination of their response as a
function of energy and angle of incidence**

中子参考辐射 第3部分：场所剂量仪和个人剂量计的校准及其能量和角响应的确定

(English Translation)

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Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part 1: Structure and Drafting Rules of Standardization Documents".

Drafting.

---Part 1: Radiation Characteristics and Generation Methods;

---Part 2: Calibration Fundamentals of Radiation Protection Instruments Related to Fundamental Quantities Characterizing Radiation Fields;

---Part 3: Calibration of site dosimeters and personal dosimeters and determination of their energy and angular responses.

This document is modified to adopt ISO 8529-3:2023 "Neutron reference radiation fields - Part 3: Calibration of site dosimeters and personal dosimeters".

"Determination of neutron energy and incident angle response".

This document has undergone significant structural adjustments compared to ISO 8529-3:2023. A comparison of the structural numbering changes between the two documents is provided below.

See Appendix A for the table.

The technical differences between this document and ISO 8529-3:2023, and the reasons therefor, are as follows.

---Some statements in the scope have been removed (see Chapter 1) to increase operability;

---ISO 29661 (see Chapter 3, 4.3.2, 6.3.1, 7.1) has been replaced with the normatively referenced GB/T 44632 to facilitate inter-standard coordination.

Same application;

---The term "uniform irradiation" (see 3.2 of ISO 8529-3:2023) has been deleted because it contains a requirement clause;

---ISO 8529-1 (see Chapters 4-6) has been replaced with the normatively referenced GB/T 14055.1 to facilitate inter-standard coordination.

application;

---ISO 8529-2 (see Chapters 4-7) has been replaced with the normatively referenced GB/T 14055.2 to facilitate inter-standard coordination.

application;

---Added provisions regarding uniform irradiation (see 4.1.2) to improve operability;

---ISO/IEC Guide 98-3 (see Chapter 7) has been replaced with the normatively referenced GB/T 27418 to adapt to my country's technical requirements.

Add components and increase operability.

---To harmonize with existing standards, the standard name has been changed to "Neutron

Reference Radiation Part 3: Site Dosimeters and Personal Dosimeters".

Calibration and Determination of its Energy and Angular Response;

---Explanations and units for the symbols in formulas (1) and (2) have been added;

---The units of the conversion factors in Tables 1, 2, 3, and 4 have been corrected;

---Footnote b in Table 2, and footnotes b and c in Table 4 have been deleted.

Please note that some content in this document may involve patents. The issuing organization of this document assumes no responsibility for identifying patents.

This document was proposed and is under the jurisdiction of the National Nuclear Energy Standardization Technical Committee (SAC/TC58).

Introduction

GB/T 14055 "Neutron Reference Radiation" is applied to instruments used for calibrating neutron measuring instruments and determining their energy and angular responses.

Neutron reference radiation, with the development of domestic nuclear energy, nuclear medicine and radiotherapy, nuclear technology applications, environmental protection and national defense, involves...

With the increasing number of radioactive sites and applications, the use of neutron measuring instruments has increased significantly, leading to a growing demand for metrological calibration.

As a result, the use of neutron reference radiation for calibrating neutron measuring instruments and determining their energy and angular responses is gradually increasing in China.

GB/T 14055 "Neutron Reference Radiation" is proposed to consist of three parts.

---Part 1: Radiation Characteristics and Generation Methods. The purpose is to standardize the radiation characteristics requirements and generation methods for the neutron reference radiation field.

---Part 2: Calibration basis of radiation protection instruments related to fundamental quantities characterizing the radiation field. The aim is to lay the foundation for the proposed neutron metrology...

---Part 3: Calibration of site dosimeters and personal dosimeters and determination of their energy and angular responses. The aim is to provide a basis for the use of neutrons.

This provides guidance for personnel who reference radiation calibration site dosimeters and personal dosimeters and determine their energy and angular responses.

GB/T 14055 (all parts) systematically defines and specifies the relevant technical

requirements for neutron reference radiation, effectively standardizing this process.

The performance of metrology equipment effectively improves the accuracy and reliability of neutron measuring instrument calibration results, thereby reducing the cost for neutron measuring instrument manufacturers.

The technological risks and costs for homeowners and users.

This document relates to site dosimeters and personal dosimeters used for monitoring. This document describes the dosimeters used according to the International Commission on Radiation Units and Measurements.

(ICRU) Procedures for practical quantity calibration and response determination. These are defined in ICRU Report No. 39 and ICRU Report No. 51. Due to radiation...

For the purposes of protection, these practical quantities are considered to be sufficiently accurate approximations of protection. For the purposes of this document, the focus will be on the use of appropriate...

The conversion factor in the phantom is used to evaluate the practical amount at a defined depth of 10 mm in the body.

Measuring the dosimeter's response essentially involves three steps. First, fundamental quantities such as the neutron flux are determined at the test point. Second, the instrument to be calibrated...

The instrument's reference point is placed at the test point to determine the injection response. Finally, the instrument's response relative to an appropriate practical quantity is then expressed as a physical quantity (injection).

The conversion factor from the actual dose (dose equivalent) to the usable dose (dose equivalent) is used to determine this. This document describes the conversion factor used to determine the usability of site dosimeters and personal dosimeters for their respective applications.

Methods and conversion coefficients for responding to the neutron practical quantity in ICRU.

Neutron Reference Radiation Part 3: Site Dosimeters and Individual Calibration of human dosimeters and determination of their energy and angular response

1 Scope

This document specifies the calibration methods for field dosimeters and personal dosimeters used for neutron measurement, as well as the determination of their energy response and angular response.

method.