

Reference neutron radiations —

Part 3: Calibration of area and personal dosimeters and determination of their response as a function of neutron energy and angle of incidence

ICS 17.240

NO COPYING WITHOUT BSI PERMISSION EXCEPT AS PERMITTED BY COPYRIGHT LAW

BSI
Documents

AVA

Document Sharing Hub

National foreword

This British Standard reproduces verbatim ISO 8529-3:1998 and implements it as the UK national standard.

The UK participation in its preparation was entrusted to Technical Committee NCE/2, Health physics instrumentation, which has the responsibility to:

- aid enquirers to understand the text;
- present to the responsible international/European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;
- monitor related international and European developments and promulgate them in the UK.

A list of organizations represented on this committee can be obtained on request to its secretary.

Cross-references

The British Standards which implement international or European publications referred to in this document may be found in the BSI Standards Catalogue under the section entitled “International Standards Correspondence Index”, or by using the “Find” facility of the BSI Standards Electronic Catalogue.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, the ISO title page, pages ii to iv, pages 1 to 12 and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

This British Standard, having been prepared under the direction of the Engineering Sector Committee, was published under the authority of the Standards Committee and comes into effect on 15 February 1999

© BSI 06-1999

ISBN 0 580 30927 4

Amendments issued since publication

Amd. No.	Date	Comments

Contents

	Page
National foreword	Inside front cover
Foreword	iii
Text of ISO 8529-3	1

INTERNATIONAL STANDARD

ISO
8529-3

First edition
1998-11-15

Reference neutron radiations —

Part 3:

Calibration of area and personal dosimeters
and determination of their response as a
function of neutron energy and angle of
incidence

Rayonnements neutroniques de référence —

*Partie 3: Étalonnage des dosimètres de zone (ou d'ambiance) et individuels
et détermination de leur réponse en fonction de l'énergie et de l'angle
d'incidence des neutrons*



Contents

	Page
Foreword	iii
Introduction	1
1 Scope	1
2 Normative references	1
3 Definitions	2
4 Procedures	4
4.1 General principles	4
4.2 Monoenergetic and polyenergetic reference neutron fields	5
4.3 Measurement procedures	6
5 Procedures for calibrating and determining the dose equivalent response of portable and installed area dosimeters	7
5.1 Quality to be measured and conversion coefficients	7
5.2 Irradiation conditions	7
5.3 Evaluation of measurement	7
6 Procedures for calibrating and determining the dose equivalent response of personal dosimeters	8
6.1 Quantity to be measured and conversion coefficients	8
6.2 Irradiation conditions	8
6.3 Evaluation of measurement	10
7 Determination of the dose equivalent response in stray neutron fields	10
8 Presentation of results	10
8.1 Records and certificates	10
8.2 Statement of uncertainties	10
Annex A (informative) Statement of reference conditions and required standard test conditions	11
Annex B (informative) List of symbols used in this part of ISO 8529	11
Bibliography	12
Table 1 — Conversion coefficient $h_{\Phi}^*(10; E)$ from neutron fluence Φ to ambient dose equivalent $H^*(10)$ for monoenergetic neutron radiation (ICRP 74 ^[11])	8
Table 2 — Conversion coefficient $h_{\Phi}^*(10)$ from neutron fluence Φ to ambient dose equivalent $H^*(10)$ for ISO-recommended radionuclide sources — Average value, $\overline{h_{\Phi}^*(10)}$ (ICRP 74 ^[11])	8
Table 3 — Conversion coefficient $h_{p\Phi}(10; E, \alpha)$ from neutron fluence Φ to the dose equivalent $H_p(10)$ in the ICRU tissue slab phantom (see 3.1.3) for monoenergetic and parallel neutron radiation (expanded field) (ICRP 74 ^[11])	9
Table 4 — Conversion coefficient $h_{p\Phi}(10; \alpha)$ from neutron fluence Φ to the dose equivalent $H_p(10)$ in the ICRU tissue slab phantom (see 3.1.3) for parallel neutron radiation (expanded field) — Average value $\overline{h_{p\Phi}(10; \alpha)}$ (ICRP 74 ^[11])	9
Table A.1 — Radiological parameters	11
Table A.2 — Other parameters	11

Descriptors: Nuclear energy, nuclear radiation, neutrons, radiation protection, radiation measurement, radiation measuring instruments, exposure meters, calibration, reference sources.

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.

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.

International Standard ISO 8529-3 was prepared by Technical Committee ISO/TC 85, Nuclear energy, Subcommittee SC 2, *Radiation protection*.

ISO 8529 consists of the following parts, under the general title *Reference neutron radiations*

- *Part 1: Characteristics and methods of production;*
- *Part 2: Calibration fundamentals related to the basic quantities characterizing the radiation field;*
- *Part 3: Calibration of area and personal dosimeters and determination of their response as a function of neutron energy and angle of incidence.*

Annex A and Annex B of this part of ISO 8529 are for information only.