
Radiološka zaščita - Referenčno sevanje z rentgenskimi in gama žarki za kalibracijo dozimetrov in merilnikov doze sevanja ter za ugotavljanje njihovega odzivanja kot funkcije fotonske energije - 4. del: Kalibriranje zunanjih in osebnih dozimetrov v območjih z nizko energijo rentgenskega referenčnega sevanja (ISO 4037-4:2019)

Radiological protection - X and gamma reference radiation for calibrating dosimeters and doserate meters and for determining their response as a function of photon energy - Part 4: Calibration of area and personal dosimeters in low energy X reference radiation fields (ISO 4037-4:2019)

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Strahlenschutz - Röntgen- und Gamma-Referenzstrahlungsfelder zur Kalibrierung von Dosimetern und Dosisleistungsmessgeräten und zur Bestimmung ihres Ansprechvermögens als Funktion der Photonenenergie - Teil 4: Kalibrierung von Orts- und Personendosimetern in niedrigerenergetischen Röntgen-Referenzstrahlungsfeldern (ISO 4037-4:2019)

Radioprotection - Rayonnements X et gamma de référence pour l'étalonnage des dosimètres et des débitmètres et pour la détermination de leur réponse en fonction de l'énergie des photons - Partie 4: Étalonnage des dosimètres de zone et individuels dans des champs de référence X de faible énergie (ISO 4037-4:2019)

Ta slovenski standard je istoveten z: EN ISO 4037-4:2021

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17.240	Merjenje sevanja	Radiation measurements

SIST EN ISO 4037-4:2021

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February 2021

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English Version

**Radiological protection - X and gamma reference radiation
for calibrating dosimeters and doserate meters and for
determining their response as a function of photon energy
- Part 4: Calibration of area and personal dosimeters in
low energy X reference radiation fields (ISO 4037-4:2019)**

Radioprotection - Rayonnements X et gamma de
référence pour l'étalonnage des dosimètres et des
débitmètres et pour la détermination de leur réponse
en fonction de l'énergie des photons - Partie 4:
Étalonnage des dosimètres de zone et individuels dans
des champs de référence X de faible énergie (ISO 4037-
4:2019)

Strahlenschutz - Röntgen- und Gamma-
Referenzstrahlungsfelder zur Kalibrierung von
Dosimetern und Dosisleistungsmessgeräten und zur
Bestimmung ihres Ansprechvermögens als Funktion
der Photonenenergie - Teil 4: Kalibrierung von Orts-
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Röntgen-Referenzstrahlungsfeldern (ISO 4037-4:2019)

This European Standard was approved by CEN on 18 January 2021.

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European foreword

The text of ISO 4037-4:2019 has been prepared by Technical Committee ISO/TC 85 "Nuclear energy, nuclear technologies, and radiological protection" of the International Organization for Standardization (ISO) and has been taken over as EN ISO 4037-4:2021 by Technical Committee CEN/TC 430 "Nuclear energy, nuclear technologies, and radiological protection" the secretariat of which is held by AFNOR.

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 August 2021, and conflicting national standards shall be withdrawn at the latest by August 2021.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

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**Radiological protection — X and
gamma reference radiation for
calibrating dosimeters and doserate
meters and for determining their
response as a function of photon
energy —**

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Part 4:

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dosimeters in low energy X reference
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*Radioprotection — Rayonnements X et gamma de référence
pour l'étalonnage des dosimètres et des débitmètres et pour la
détermination de leur réponse en fonction de l'énergie des photons —*

*Partie 4: Étalonnage des dosimètres de zone et individuels dans des
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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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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This document was prepared by Technical Committee ISO/TC 85, *Nuclear energy, nuclear technologies and radiological protection*, Subcommittee SC 2, *Radiological protection*.

This second edition cancels and replaces the first edition (ISO 4037-4:2004), which has been technically revised.

A list of all the parts in the ISO 4037 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

The maintenance release of this document adjusts this fourth part to the second edition of the first three parts. This includes the improvements on high voltage generators from 1996 to 2017 (e.g., the use of high frequency switching supplies providing nearly constant potential), and the spectral measurements at irradiation facilities equipped with such generators (e.g., the catalogue of X-ray spectra by Ankerhold[1]). It also incorporates all published information with the aim to adjust the requirements for the technical parameters of the reference fields to the targeted overall uncertainty of about 6 % to 10 % for the phantom related operational quantities of the International Commission on Radiation Units and Measurements (ICRU)[2]. It does not change the concept of ISO 4037.

ISO 4037, focusing on photon reference radiation fields, is divided into four parts. ISO 4037-1 gives the methods of production and characterization of reference radiation fields in terms of the quantities photon fluence and air kerma free-in-air. ISO 4037-2 describes the dosimetry of the reference radiation qualities in terms of air kerma and in terms of the phantom related operational quantities of the International Commission on Radiation Units and Measurements (ICRU)[2]. ISO 4037-3 describes the methods for calibrating and determining the response of dosimeters and doserate meters in terms of the operational quantities of the ICRU[2]. This document gives special considerations and additional requirements for calibration of area and personal dosimeters in low energy X reference radiation fields, which are reference fields with generating potential lower or equal to 30 kV.

The general procedures described in ISO 29661 including Amendment 1 are used as far as possible in this document. In addition, the symbols used are in line with ISO 29661.

NOTE For irradiation of the whole body, $H_p(10)$ and $H^*(10)$ are relevant for radiation protection, as long as they are closer to their limit than $H'(0,07)$ and $H_p(0,07)$. This is the case down to about 15 keV.

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