

ISO 4037-3:2019 (E)

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 3: Calibration of area and personal dosimeters and the measurement of their response as a function of energy and angle of incidence

Contents

	Foreword
	Introduction
1	Scope
2	Normative references
3	Terms and definitions
4	Procedures applicable to all area and personal dosimeters
4.1	General principles
4.1.1	Radiation qualities
4.1.2	Recommended conversion coefficients
4.1.3	Point of test and reference point
4.1.4	Axes of rotation
4.1.5	Condition of the dosimeter to be calibrated
4.1.6	Effects associated with electron ranges
4.2	Methods for the determination of the calibration factor and of the response
4.2.1	Operation of the standard instrument
4.2.2	Measurements without a monitor for the source output
5	Particular procedures for area dosimeters
5.1	General principles
5.2	Quantities to be measured
6	Conversion coefficients for area dosimetry
6.1	Conversion coefficients from air kerma, K_a , to $H'(0,07)$
6.1.1	Mono-energetic radiation
6.1.2	Low air kerma rate series
6.1.3	Narrow series
6.1.4	Wide series
6.1.5	High air kerma rate series
6.1.6	Radionuclides
6.2	Conversion coefficients from air kerma, K_a , to $H'(3)$
6.2.1	Mono-energetic radiation
6.2.2	Low air kerma rate series
6.2.3	Narrow series
6.2.4	Wide series
6.2.5	High air kerma rate series
6.2.6	Radionuclides
6.2.7	High energy photon radiations
6.3	Conversion coefficient from air kerma, K_a , to $H^*(10)$
6.3.1	Mono-energetic radiation
6.3.2	Low air kerma rate series
6.3.3	Narrow series
6.3.4	Wide series
6.3.5	High air kerma rate series
6.3.6	Radionuclides

6.3.7	High energy photon radiations
7	Particular procedures for personal dosimeters
7.1	General principles
7.2	Quantities to be measured
7.3	Experimental conditions
7.3.1	Use of phantoms
7.3.2	Geometrical considerations in divergent beams
7.3.3	Simultaneous irradiation of several dosimeters
7.3.4	Influence of the orientation on the values of $H_p(0,07)$
7.3.5	Length of the rod phantom
8	Conversion coefficients for personal dosimetry
8.1	General
8.2	Conversion coefficients from air kerma, K_a , to $H_p(0,07)$ in the rod phantom
8.2.1	Mono-energetic radiations
8.2.2	Low air kerma rate series
8.2.3	Narrow series
8.2.4	Wide series
8.2.5	High air kerma rate series
8.2.6	Radionuclides
8.3	Conversion coefficients from air kerma, K_a , to $H_p(0,07)$ in the pillar phantom
8.3.1	Mono-energetic radiations
8.3.2	Low air kerma rate series
8.3.3	Narrow series
8.3.4	Wide series
8.3.5	High air kerma rate series
8.3.6	Radionuclides
8.4	Conversion coefficients from air kerma, K_a , to $H_p(0,07)$ in the ICRU slab phantom
8.4.1	Mono-energetic radiations
8.4.2	Low air kerma rate series
8.4.3	Narrow series
8.4.4	Wide series
8.4.5	High air kerma rate series
8.4.6	Radionuclides
8.5	Conversion coefficients from air kerma, K_a , to $H_p(3)$ in the cylinder phantom
8.5.1	Mono-energetic radiations
8.5.2	Low air kerma rate series
8.5.3	Narrow series
8.5.4	Wide series
8.5.5	High air kerma rate series
8.5.6	Radionuclides
8.5.7	High energy photon radiations
8.6	Conversion coefficients from air kerma, K_a , to $H_p(10)$ in the ICRU slab phantom
8.6.1	Mono-energetic radiations
8.6.2	Low air kerma rate series
8.6.3	Narrow series
8.6.4	Wide series
8.6.5	High air kerma rate series
8.6.6	Radionuclides
8.6.7	High energy photon radiations
9	Uncertainties
9.1	Statement of uncertainties
Annex A	(informative) Estimated conversion coefficients for fluorescence X radiation
A.1	Principle
A.2	General
A.3	Estimated conversion coefficients for area dosimetry
A.3.1	Estimated conversion coefficients from air kerma, K_a , to $H'(0,07)$
A.3.2	Estimated conversion coefficient from air kerma, K_a , to $H^*(10)$
A.4	Estimated conversion coefficients for personal dosimetry
A.4.1	Estimated conversion coefficients from air kerma, K_a , to $H_p(0,07)$ in the rod phantom
A.4.2	Estimated conversion coefficients from air kerma, K_a , to $H_p(0,07)$ in the pillar phantom

- A.4.3 Estimated conversion coefficients from air kerma, K_a , to $H_p(0,07)$ in the ICRU slab phantom
 - A.4.4 Estimated conversion coefficients from air kerma, K_a , to $H_p(10)$ in the ICRU slab phantom
- Annex B (informative) Estimated conversion coefficients for gamma radiation emitted by ^{241}Am radionuclide**
- B.1 General
 - B.2 Estimated conversion coefficients for area dosimetry
 - B.2.1 Estimated conversion coefficients from air kerma, K_a , to $H'(0,07)$
 - B.2.2 Estimated conversion coefficients from air kerma, K_a , to $H^*(10)$
 - B.3 Estimated conversion coefficients for personal dosimetry
 - B.3.1 Estimated conversion coefficients from air kerma, K_a , to $H_p(0,07)$ in the rod phantom
 - B.3.2 Estimated conversion coefficients from air kerma, K_a , to $H_p(0,07)$ in the pillar phantom
 - B.3.3 Estimated conversion coefficients from air kerma, K_a , to $H_p(0,07)$ in the ICRU slab phantom
 - B.3.4 Estimated conversion coefficients from air kerma, K_a , to $H_p(10)$ in the ICRU slab phantom
- Annex C (informative) Estimated conversion coefficients for continuous filtered X radiation based on the quality index**
- Annex D (informative) Additional information**
- D.1 Statement of reference conditions and required standard test conditions
 - D.1.1 Radiological parameters
 - D.1.2 Other parameters
 - D.2 Effects associated with electron ranges

Page count: 68