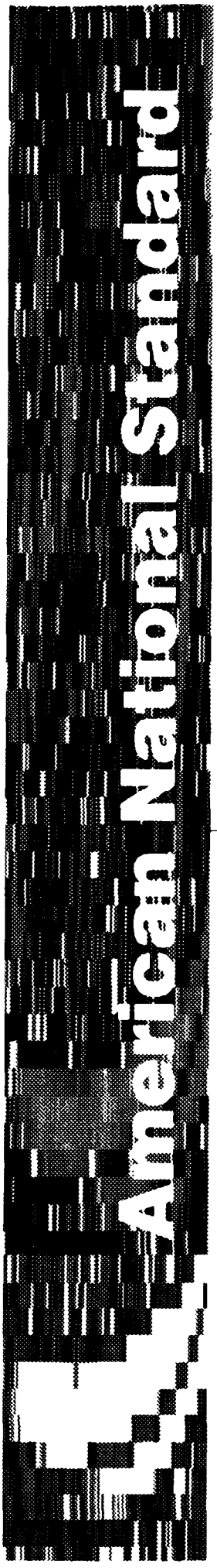

Performance Specifications for Direct Reading and Indirect Reading Pocket Dosimeters for X- and Gamma Radiation

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ANSI American National Standards Institute
11 West 42nd Street
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American National Standard Performance Specifications for Direct Reading and Indirect Reading Pocket Dosimeters for X- and Gamma Radiation

Secretariat

Atomic Industrial Forum, Inc

Approved December 9, 1971

American National Standards Institute, Inc

American National Standard

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Foreword

(This Foreword is not a part of American National Standard Performance Specifications for Direct Reading and Indirect Reading Pocket Dosimeters for X- and Gamma Radiation, N13.5-1972.)

At the 1965 Paris meeting of the International Organization for Standardization (ISO), Working Group 3 of Technical Committee 85 (ISO/TC 85/WG 3) was established to develop a standard for pocket dosimeters. The United States was formally requested through the American National Standards Institute to provide a U.S. participant to the ISO Working Group. The U.S. participant established an ad hoc committee of experts to provide technical assistance in the development of the ISO International Standard. To obtain maximum benefit from this effort, Subcommittee N13-5 of American National Standards Committee N13 was established to develop a similar standard for consideration and adoption as an American National Standard. The specifications contained herein represent both user and manufacturer consensus and are found to be sufficiently consistent with the ISO Working Group 3 effort.

Attention is drawn to the fact that the performance specifications contained herein relate only to measurements of gamma and X-radiation. Energetic beta rays may, depending upon the dosimeter wall thickness, penetrate the wall of the dosimeters and provide an artificially high gamma dose reading. In such cases where high energy beta rays are anticipated, the dosimeter should be modified to minimize such response.

Suggestions for improvement gained in the use of this standard will be welcome. They should be sent to the American National Standards Institute, 1430 Broadway, New York, N.Y. 10018.

The American National Standards Committee on Radiation Protection, N13, which reviewed and approved this standard, had the following personnel at the time of approval:

J. W. Healy, Chairman
James E. Sohngen, Secretary

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American Conference of Governmental Industrial Hygienists	D. E. Van Farowe
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	Walter Cool (Alt)
U.S Department of Labor, Bureau of Labor Standards	John P. O'Neill
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U.S. Public Health Service	John Villforth
Individual Members	William O. Chatfield
	Donald Fleckenstein
	Duncan A. Holaday
	Remus G. McAllister

Subcommittee N13-5 on Performance of Portable Survey Meters and Personnel Dosimeters, which which was responsible for developing this standard, consisted of the following personnel:

Edward J. Vallario, Chairman

Frank H. Attix
Joseph Belliar
Edwin Bemis
John Handloser
Ronald Kathren
Thomas P. Loftus
Wade Patterson
Carl Siebentrit

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American National Standard Performance Specifications for Direct Reading and Indirect Reading Pocket Dosimeters for X- and Gamma Radiation

1. Purpose and Scope

This standard defines essential performance characteristics of direct and indirect reading pocket-type radiation detectors. These specifications apply to direct and indirect reading pocket exposure meters responding to X- or gamma radiation, or both, with energies extending from 30 keV up to 3 MeV. These pocket dosimeters are understood to be instruments to be carried on the body and from which the measured exposure can be read directly or from a separate electrometer. They are not suitable for use in mixed fields of radiation such as gamma-neutron fields.

Specifications for interrelating mechanical and electrical properties are outside the scope of this standard and are a matter of separate consideration.

2. Definitions

2.1 Direct Reading Pocket Dosimeter. A direct reading pocket ionization dosimeter is basically a capacitor with a single movable electrode. The capacitor is charged to a predetermined voltage which results in a given separation of the two electrodes. When exposed to X- or gamma radiation, or both, ionization occurs in the chamber surrounding the electrodes and causes a decrease in the charge on the electrodes. This results in a change of position or deflection of the movable electrode. The magnitude of the deflection is a function of the radiation exposure and is observable through a self-contained optical system.

2.2 Indirect Reading Pocket Dosimeter. An indirect reading pocket dosimeter is basically a capacitor which is charged to a predetermined voltage. When exposed to X- or gamma radiation, or both, ionization occurs in the chamber containing the electrodes, causing a decrease in the charging voltage. The change in voltage is proportional to the exposure. The indirect reading dosimeter utilizes an external electrometer system to read the dosimeter.

3. Application

Personnel exposure meters are intended for use in estimating the radiation exposure to the wearer; therefore, they are usually worn near that part of the body most likely to receive the greatest exposure.

4. Markings

4.1 The scale of the dosimeter shall be marked in roentgen or milliroentgen. The scale shall indicate the unit used and be divided into at least ten and not more than 25 divisions. Every fifth scale marking shall be longer and shall be labeled with the appropriate exposure level.

4.2 The manufacturer's name should appear on each instrument.

4.3 Each meter shall be provided with an individual engraved or stamped identification mark for recording purposes.

5. Adjustment and Sealing

Where the sensitivity of an exposure meter is adjustable, the instrument shall be sealed in such a way that the adjustment cannot be changed without breaking the seal.

6. Exterior Surfaces

Exterior surfaces of dosimeters shall be hard and smooth, with as few joints as practicable, to minimize retention of radioactive contamination and facilitate cleaning.