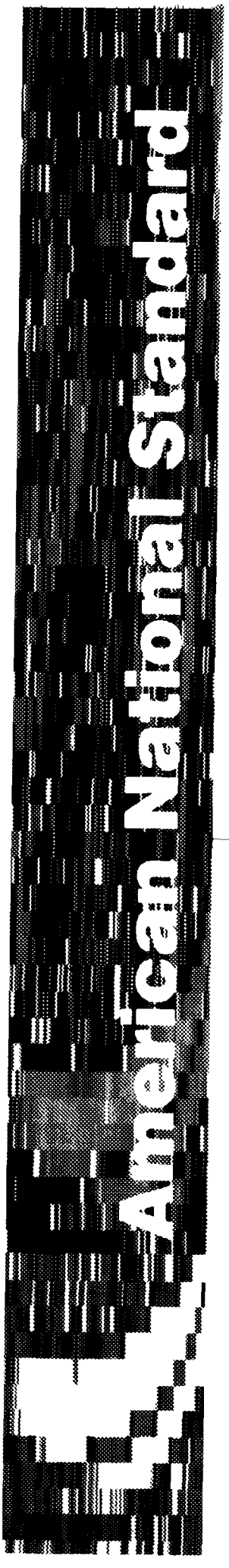

for Radiation Protection –

Photographic Film Dosimeters – Criteria for Performance

ANSI N13.7-1983

ANSI American National Standards Institute
11 West 42nd Street
New York, New York
10036

ANSI®
N13.7-1983
Revision of
ANSI N13.7-1972

American National Standard for Radiation Protection — Photographic Film Dosimeters — Criteria for Performance

Secretariat
Health Physics Society

Approved November 9, 1981
American National Standards Institute, Inc

American National Standard

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Foreword (This Foreword is not a part of American National Standard N13.7-1983.)

This standard is a completely revised version of American National Standard Criteria for Film Badge Performance, ANSI N13.7-1972, which was based largely on a study for the U.S. Atomic Energy Commission to determine radiation responses of existing film badges and to specify the requirements of a film badge calibration laboratory.

In 1975, a Health Physics Society work group was charged with writing a new standard that would establish criteria for testing personnel dosimetry performance. This effort resulted in American National Standard for Dosimetry – Personnel Dosimetry Performance – Criteria for Testing, ANSI N13.11-1983 which, prior to publication, underwent a one-year trial period in 1978 and extensive commentary.

As a consequence, it became apparent in 1978 that ANSI N13.7-1972 would soon become obsolete. In that year, a working group was given the task of writing a completely new revision that would consider only those effects on film dosimeters that would not be covered by ANSI N13.11-1983. As a result, ANSI N13.7-1983 defines and specifies tests and performance criteria for several environmental variables, and for the effects of varying the photon angle of incidence.

Suggestions for improvement of this standard will be welcome. They should be sent to the Health Physics Society, 4720 Montgomery Lane, Suite 506, Bethesda, Md. 20014.

This standard was processed and approved for submittal to ANSI by American National Standards Committee on Radiation Protection, N13. Committee approval of the standard does not necessarily imply that all members voted for its approval. At the time it approved this standard, the N13 Committee had the following members:

J. W. Poston, Chairman
Paul Ziemer, Vice-Chairman
R. J. Burk, Secretary

Organization Represented	*Name of Representative*
Alliance of American Insurers	Richard M. Seelye
American Conference of Governmental Industrial Hygienists	D. E. Van Farowe
American Industrial Hygiene Association	H. Wilbur Speicher
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	John V. Nehemias (Alt)
U.S. Public Health Service	Gail D. Schmidt
	Robert E. Simpson (Alt)

Individual Members
John A. Auxier
Hugh F. Henry
Edward K. Reitler, Jr
L. Max Scott
McDonald E. Wrenn

The Health Physics Society Standards Committee (HPSSC), which directed the preparation of this standard, had the following members

Bryce L. Rich, Chairman

Vernon T. Chilson
Eric L. Geiger
Thomas M. Gerusky
James C. Malaro
William A. Mills
Harley V. Piltingsrud
Phillip Plato
Max M. Weiss

HPSSC/N13 Working Group 1.1, which was responsible for the development of this standard, had the following members

Eric T Clarke, Chairman

Donald E. Barber
William Baumgartner
Carl H. Distenfeld
Robert S. Landauer

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American National Standard for Radiation Protection — Photographic Film Dosimeters — Criteria for Performance

1. Scope and Purpose

1.1 Scope. This standard sets forth performance criteria for photographic film dosimeters that are exposed to heat, humidity, aging, chemical vapors, and ambient light. It also specifies the performance of film dosimeters when they are irradiated with isotropic rather than normally incident photons. This standard does not cover evaluation of dosimeter response to different types and energies of incident radiation, nor does it apply to neutron-track emulsions. In general, it is consistent with Personal Photographic Dosimeters, ISO 1757-1980.

1.2 Purpose. Photographic film dosimeters are commonly used devices for estimating the dose equivalent received by personnel working in ionizing radiation environments. In the United States, they are generally provided as a part of a film dosimetry system by private, commercial, and government suppliers of dosimetry services. Users of these services expect the reported results to be free of excessive errors due to poor film dosimeter performance characteristics and processing. Hence, film dosimeter suppliers need to know that their dosimeters meet a set of minimum performance criteria for various radiation categories under standardized exposure conditions. Such criteria have been established in American National Standard for Dosimetry – Personnel Dosimetry Performance – Criteria for Testing, ANSI N13.11-1983. However, ANSI N13.11-1983 does not cover certain variables that may have important effects on performance. It is the purpose of this standard to specify tests and minimum performance criteria for film dosimeters under environmental conditions involving the variables of temperature, humidity, aging, ambient light, and chemical vapors.

Film dosimeters may also be sensitive to solarization and to the angular distribution of the photon radiation incident on them. This standard, therefore, specifies tests and minimum performance criteria for film dosimeters irradiated with photons at high exposures and at other than normal incidence.

2. Referenced Standards

2.1 Referenced American National Standard. This standard is intended to be used in conjunction with the following American National Standard.

American National Standard for Dosimetry – Personnel Dosimetry Performance – Criteria for Testing, ANSI N13.11-1983

2.2 Other Referenced Standards. This standard is also intended to be used in conjunction with the following standards:

Personal Photographic Dosimeters, ISO 1757-1980[1]

Radiation Quantities and Units, ICRU Report 33, 1980[2]

3. Definitions[3]

control dosimeter. A dosimeter that has experienced the same environmental conditions but has not been exposed to the radiation that a corresponding dosimeter is intended to evaluate.

effective energy (of a photon beam). The energy of monoenergetic photons whose total attenuation coefficient in aluminum or copper equals the photon beam's differential rate of absorption measured under good geometry conditions and extrapolated to zero thickness of the same material.

exposure. A quantitative measure of the radiation experienced by a film dosimeter that, for ionizing radiation, is usually reported in terms of the dose equivalent in the body immediately beneath the dosimeter.

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[1] Available from American National Standards Institute.

[2] Available from the International Commission on Radiation Units and Measurements, ICRU Publications, P.O. Box 30165, Washington, D.C. 20814.

[3] Radiation quantities and units not defined herein shall be as defined in ICRU 33, 1980.