

ICS 17.240
CCS A 58



**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 16640-2008

Replacing GB/T 16640-1996

**Standard guide for selection and calibration of dosimetry
systems for radiation processing**

辐射加工剂量测量系统的选择和校准导则

(English Translation)

Issued on: September 19, 2008

Implemented on: August 1, 2009

Issued by: Standardization Administration of China

Table of Contents

Introduction

1 Scope

2 Normative references

3 Terms and definitions

4 4 Meaning and Purpose

Classification and application of dosimeters 4

Select 6 Dosimetry System

7 Analytical instrument calibration and performance verification

8 Calibration of dosimetry systems

9 Products absorbed dose formulation

10 Basic documentation requirements

11 12 Measurement Uncertainty

Keywords 12

Appendix A (informative) absorbed dose formulation

Annex B (informative) additional dose is determined

Annex C (informative) Sources of Uncertainty

Annex D (informative) dosimeters characteristic example

Methods Appendix E (normative) measure dose response rate of

References

Foreword

This standard is identical with ISO/ASTM51261:2002 "guide selection and calibration of dosimetry systems for radiation processing is" (in English).

For ease of use, this standard made the following editorial changes.

- a) prepared in accordance with Chinese customary for some format has been modified.
- b) for ISO/ASTM51261. other international standards cited in 2002 have been adopted as the equivalent of a standard, this standard with References of these national standards or industry standards corresponding to international standards in place, the rest not tantamount to the adoption of the standards of China International standards in this standard are a direct reference.
- c) the original number of international standards in Appendix A1, A2, A3, A4, A5 to

Appendix A, Appendix B, Appendix C, Appendix D, Appendix E.

This standard replaces GB/T 16640-1996 "dosimetry systems for radiation processing Selection and Calibration Guide." This standard GB/T 16640-1996 main changes are as follows.

- Redefined the standard "meaning and purpose" (1996 version 4.1,4.2,4.3; Excerpts 4.1,4.2,4.3);
- Standard dosimeter broken reference standard dosimeters and transfer standard dosimeter, an increase of the reference dosimeter reference dosimeter Define (1996 Version 5.1; Excerpts 5.1,5.1.1,5.1.2);
- Added "Common Criteria" and "additional criteria work dosimeter measurement system" dosimeter Measurement system selection (see Chapter 6);
- Increasing the dose calibration of the measuring system "provides procedures, protocols and staff training" provisions (see 8.1.2);
- Increase the response rate to determine the absorbed dose and dose response transfer provisions (see 8.4 and 8.5);
- Increasing the provision of basic documentation requirements (see 10.5, 10.6, and 10.7);
- Increased Evaluative Principles of Measurement Uncertainty (see Chapter 11);
- Increase the informative appendix "absorbed dose of expression" (see Appendix A);
- Increase the informative appendix "Additional doses OK" (see Appendix B);
- Added Appendix "method of measuring the dose rate response" informative (see Appendix E).

The Standard Appendix A, Appendix B, Appendix C, Appendix D, Appendix E is an information appendix.

The standard proposed by China National Nuclear Corporation.

This standard by the National Standardization Technical Committee of nuclear energy.

This standard was drafted. China Institute of Metrology.

1 Scope

1.1

standard specifies the gamma-ray, X-ray and electron beam radiation processing for selecting the measurement of absorbed dose and dose measurement system the basic principle of the calibration. This standard gives the commercial type for calibration and

quality assurance in radiation processing dosimetry systems, absorbents Uncertainty Evaluation Method and dose measurement of the expression amount. Calibration of analytical instruments in the relevant standard dose measurement system.

1.2

This standard measure absorbed dose limit of 1000kGy; radiant energy in the range of 0.1MeV ~ 50MeV (photons and electrons).

Use 1.3 standard should be integrated with the application-specific standard dosimetry systems.

1.4

This standard does not include neutron dosimetry for radiation processing or heavy charged particles.

1.5

standard does not address safety issues associated with the user (if it exists). Users of this standard is responsible for establishing the applicable safety and health Health standards, and prior to use to determine the applicable limits.

2 Normative references

The following documents contain provisions which, through reference in this standard and become the standard terms. For dated references, subsequent Amendments (not including errata content) or revisions do not apply to this standard, however, encourage the parties to the agreement are based on research Whether the latest versions of these documents. For undated reference documents, the latest versions apply to this standard.

GB/T 16509 doses of radiation processing of Measurement Uncertainty guidelines (GB/T 16509-2008, ISO/ASTM51707.

2005, IDT)

GB/T 16510 radiation processing dosimetry calibration laboratory competency requirements (GB/T 16510-2008, ISO/ASTM51400.

2002, IDT)

GB/T 16639 -EPR alanine dosimetry system using standard methods (GB/T 16639-2008, ISO/ASTM51607.

2004, IDT)

GB/T 16841 energy of 300keV ~ 25MeV electron beam radiation processing dosimetry guidelines (GB/T 16841-2008, ISO/ASTM51649:2005, IDT) ASTM E170 radiation dose measurement and academic language ASTM E178 practice handling outlier observations ASTM E456 volume and statistical terms the method of calculation of X or gamma-ray

absorbed dose ASTM E666 ASTM E668 using thermoluminescence (TLD) dosimetry systems for electronic equipment to determine the absorbed dose of radiation damage test in practice ASTM E1026 use standards Frick standard dosimetry system Practice ISO/ASTM 51204 for food processing gamma radiation dose measurement device ISO/ASTM 51275 use color film radiation dose measurement system with standard practice ISO/ASTM 51276 using polymethylmethacrylate dosimetry system with standard practice ISO/ASTM 51310 using radiation chemistry optical waveguide dosimetry system Practice ISO/ASTM 51431 electron beam and bremsstrahlung dosimetry equipment for food processing practices ISO/ASTM 51538 chlorobenzene - Practice ethanol dose measurement system ISO/ASTM 51540 using chemical liquid radiation dose measurement system practice Electron beam dose measurements and dosimeter calibrations practice ISO/ASTM 51631 amount of thermal dosimetry system GB/T 16640-2008/ISO/ASTM 51261:2002