

ICS 19.100
CCS N78



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

GB/Z 41285.4-2022

**Non-destructive testing instruments - Radiation protection rules for the
technical application of sealed radioactive sources - Part
4: Construction and testing of mobile apparatus for gamma radiography**

无损检测仪器 密封放射性源技术应用射线防护规则 第4部分：γ射线机用可移动
设备的制造和检测

Issued on: March 9, 2022

Implemented on: March 9, 2022

**Issued by: State Administration for Market Regulation;
Standardization Administration of China**

Table of Contents

- 1 Scope
- 2 Normative references
- 3 Terms and Definitions
- 4 Removable equipment for gamma ray machines Manufacturing and Testing

Foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for Standardization Work Part

1. Structure and Drafting Rules of Standardization Documents" drafted. This document is part 4 of GB /Z 41285 "Rules for Radiation Protection of Non-destructive Testing Instruments Sealed Radioactive Source Technology Application". GB /Z 41285 has published the following parts.

1. Fixed and mobile operation of gamma-ray machines.

3. Radiation protection measures for gamma ray machines during operation and transportation.

4. Manufacture and testing of removable equipment for gamma ray machines.

5. Precautions for gamma ray machines.

6. Inspection, maintenance and functional testing of removable equipment for gamma ray machines. Please note that some content of this document may be patented. The issuing agency of this document assumes no responsibility for identifying patents. This document is proposed by China Machinery Industry Federation. This document is under the jurisdiction of the National Standardization Technical Committee of Testing Machines (SAC/TC122).

This document is drafted by: Liaoning Instrument Research Institute Co., Ltd., Liaoning Rail Transit Vocational College, Shenzhen Guoji Instrument Co., Ltd., Xiamen CTI Testing Technology Co., Ltd., Edson (Xiamen) Electronics Co., Ltd., GE Testing and Control Technology (Shanghai) Co., Ltd., Zhongshan Vocational and Technical College, Shanghai Yinghua Testing Technology Co., Ltd. The main drafters of this document. Yu Zhijun, Cai Jing, Zhu Ping, Shentu Xianzhong, Lin Junming, Kong Fanqin, Fuyang, Wang Lin, Li Bo.

Gamma rays are electromagnetic waves with a shorter wavelength and higher energy than X-rays, and have extremely strong penetrating power. Gamma ray flaw detection is the use of gamma The penetration and linearity of rays are used to detect flaws. Because of this, when the human body is irradiated by gamma-rays, the gamma-rays enter the human body.

The ionization effect occurs with the cells in the body, and the ions generated by the ionization will erode the organic molecules in the body, such as proteins, enzymes, etc. Once the main components of living cell tissues are destroyed, the normal chemical processes in the human body will be disturbed, and in severe cases, cells may die. Death. The purpose of this document is to provide structural protection, operating conditions and environment, protective measures, etc. information, and then put forward suggestions on industrial gamma ray protection, labor safety, labor hygiene and other issues, and provide suggestions on ray protection methods, personal safety, etc. play a normative role. GB /Z 41285 is intended to be composed of 5 parts.

- 1.Fixed and mobile operation of gamma-ray machines. The purpose is to clarify the basic protection of gamma-ray machine during fixed and mobile operation. protection rules and requirements.
- 3.Radiation protection measures for gamma ray machines during operation and transportation. The purpose is for the use and operation of the gamma ray machine Provide effective and reliable radiation protection measures during transportation.
- 4.Manufacture and testing of removable equipment for gamma ray machines. The purpose is to provide a seal for gamma ray machine manufacturing and inspection Guidelines for the use of radioactive materials, and the safety measures established to protect the safety of those involved.
- 5.Precautions for gamma ray machines. The purpose is to provide recommendations for preventive measures for gamma ray machine operation.
- 6.Inspection, maintenance and functional testing of removable equipment for gamma ray machines. The purpose is to improve the mobile gamma ray machine Suggestions are made on inspection cycle, annual maintenance, and functional inspection of equipment to ensure that equipment can operate safely. Nondestructive testing instruments Radiation protection rules for the technical application of sealed radioactive sources Part

1 Scope

GB/Z 41285.4-2022 is the Chinese national standard on non-destructive testing instruments - radiation protection rules for the technical application of sealed radioactive sources - part 4:construction and testing of mobile apparatus for gamma radiography, in the field of testing. The /Z suffix marks it as a guiding technical document: it does not prescribe requirements that can be certified against, but sets out the technique, the method or the state of the art that the standards bodies recommend following. It was issued on 9 March 2022 by the State Administration for Market Regulation; Standardization Administration of China. As a guiding technical document it carries no separate date of entry into force: it applies from publication. Classification: ICS 19.100, CCS N78. This page is published from the official record of the standard held by the Chinese standards administration: the

identification, the dates, the classification and the issuing body are taken from there. The clause text, the tables and the numeric limits are in the document itself, which is delivered complete in English translation.

This document specifies source container classification, body dose limits, requirements, equipment documentation, list of other documentation for removable equipment for gamma ray machines and structural verification, etc. This document is applicable to the manufacture and inspection of gamma-ray portable radiation equipment. The scope of application of this document is limited to Class P and M working vessels in 4.2, Class I and Class II working vessels in 5.1, not applicable to Class F or Class X. This document applies to radioactive sources with activity not greater than $1.85 \times 10^{14} \text{Bq}$.

2 Normative references

The contents of the following documents constitute essential provisions of this document through normative references in the text. Among them, dated citations documents, only the version corresponding to that date applies to this document; for undated references, the latest edition (including all amendments) applies to this document.

GB/T 2423.43 Environmental Testing of Electrical and Electronic Products Part

2.Test Methods Vibration, Shock and Similar Dynamic Test Specimens Installation of products (

IEC 60068-2-47.2005, IDT)

GB/T 2423.56 Environmental testing of electrical and electronic products - Part

2.Test method Test Fh. Broadband random vibration (digital control system) and guidelines (

IEC 60068-2-64.2008, IDT)

GB 11806-2004 Regulations for the safe transportation of radioactive substances

GB 18871-2002 Basic standard for ionizing radiation protection and radiation source safety

GB/T 19001 Quality Management System Requirements (ISO 9001.2008, IDT)

GB/T 20159.7 Environmental condition classification Relationship between environmental condition classification and environmental test and conversion guide Fixed use (IEC /T R60721-4-7.2003, MOD)

3 Terms and Definitions

The following terms and definitions apply to this document.

3.1 A source activity determined by the manufacturer to ensure that the specified radionuclide in the designated working container does not exceed the shielding

requirements in Table 1 maximum value.

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