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**NATIONAL STANDARD OF THE  
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**Non-destructive testing instruments - Radiation protection  
rules for the technical application of X-ray equipment up to 1MV  
- Part 2: Technical requirements for protection**

无损检测仪器 1MV以下X射线设备的辐射防护规则 第2部分：防护技术要求

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## Table of Contents

- 1 Scope
- 2 Normative references
- 3 Terms and Definitions
- 4 Technical requirements for X-ray equipment protection
  - 4.2 Requirements for protective equipment
    - 4.2.2 Precision protective X-ray equipment

### 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 2 of GB /Z 41476 "Rules for Radiation Protection of X-ray Equipment Below 1MV for Nondestructive Testing Instruments". GB /Z 41476 has published the following parts.

- 1. General safety technical requirements;
- 2. Technical requirements for protection;
- 3. Calculation formulas and charts for radiation protection of X-ray equipment below 450kV;
- 4. Calculation of the control area. 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., Shenzhen Guoji Instrument Co., Ltd., Xiamen CTI Testing Technology Co., Ltd. Co., Ltd., Edson (Xiamen) Electronics Co., Ltd., Shanghai Yinghua Testing Technology Co., Ltd., General Electric Testing and Control Technology (Shanghai) Co., Ltd. Company, Institute of Applied Electronics, Chinese Academy of Engineering Physics, Guangdong Zhengye Technology Co., Ltd. The main drafters of this document. Yu Zhijun, Pang Yan, Huang Qing, Lin Junming, Li Bo, Kong Fanqin, Chen Hao, Sheng Zhoulin.

X-rays are electromagnetic waves with extremely short wavelengths and high energy, and their wavelengths are shorter than those of visible light. As five routine detection methods One, X-ray detection has been widely used in industrial non-destructive testing. Because of its strong penetration, it will cause certain damage to the body of the inspector. The safety protection problem in this X-ray inspection has received extensive attention. GB /Z 41476

aims to establish protection requirements for X-ray equipment below 1MV And personnel safety protection rules, it is proposed to be composed of 4 parts.

1.General safety technical requirements. The purpose is to give the dose limit for personnel in the operation of X-ray equipment below 1MV, Equipment usage requirements, etc.

2.Technical requirements for protection. The purpose is to provide effective, Reliable radiation protection measures.

3.Calculation formulas and charts for radiation protection of X-ray equipment below 450kV. The purpose is to give below 405kV The calculation formulas and related charts of the main technical indicators of X-ray equipment protection are convenient for the calculation of relevant data in the process of X-ray protection.

4.Calculation of the control area. The purpose is to provide a calculation method for the control area of X-ray equipment below 1MV, and for the third Some content is further supplemented. Non-destructive testing equipment X-ray below 1MV Radiation Protection Regulations for Equipment Part 2. Protection technical requirements

## 1 Scope

GB/Z 41476.2-2022 is the Chinese national standard on non-destructive testing instruments - radiation protection rules for the technical application of x-ray equipment up to 1mv - part 2: technical requirements for protection, 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 15 April 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 the protection technical requirements and radiation protection documents for X-ray non-destructive testing equipment below 1MV. This document applies to safety protection during the production, installation and use of X-ray non-destructive testing equipment below 1MV.

## 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 /Z 41476.1-2022

Radiation protection rules for X-ray equipment below 1MV of non-destructive testing instruments Part

### 3 Terms and Definitions

There are no terms and definitions that need to be defined in this document.

### 4 Technical requirements for X-ray equipment protection

4.1 Safety protection requirements During the manufacture, installation and use of X-ray equipment, the impact of radiation leakage on surrounding personnel shall not exceed GB /Z 41476.1- Provisions of

#### 4.2 Requirements for protective equipment

4.2.1 General Protective equipment is technical equipment that protects people from X-ray injuries. Failure of any component of these technical equipment should not result in major consequences. In order to ensure the safe use of X-ray equipment, X-ray equipment should be equipped with protective equipment that meets the regulations. The failure of the protective equipment should be identified and resolved before the next start, and it should be ensured that the failure does not recur.

##### 4.2.2 Precision protective X-ray equipment

4.2.2.1 General requirements The radiation dose rate at a distance of 0.5m from a radiation source with a closed radiation window at the rated power provided by the manufacturer (using a surrounding agent rate) should not exceed 25 $\mu$ Sv/h.