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

GB/T 12163-2026

Replacing GB/T 12163-1990

**Lead shielding units for 50mm and 100mm thick walls used for
protection against ionizing radiation**

用于防护电离辐射的50mm和100mm厚墙的铅屏蔽构件

(English Translation)

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Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part 1: Structure and Drafting Rules of Standardization Documents".

Drafting.

This document supersedes GB/T 12163-1990 "Lead Shielding Components for 50mm and 100mm Thick Walls for Protection Against Ionizing Radiation" and is consistent with...

Compared with GB/T 12163-1990, apart from structural adjustments and editorial changes, the main technical changes are as follows.

- a) Added terms and definitions for "lead shielding components" (see 3.1), "antimony content" (see 3.2), and "wedge joint" (see 3.3);
- b) Explanation of the changed code names (see Chapter 4, Chapter 2 of the 1990 edition);
- c) Lead shielding components such as columns (see 6.6, 7.6) and detachable circular perforated bricks (see 6.7.3, 7.7.2) were added, and corner bricks were expanded.

The types of component dimensions in perforated bricks, windows, ball bearing components, plugs, and reduced-cavity components (see 6.3, 6.7.3, 6.8.3, 6.9, 6.10).

6.11, 7.3, 7.7.2, 7.8.2, 7.9, 7.10, 7.11);

- d) The "approximate mass" of the component is recalculated and changed to the "minimum reference mass" (see Tables 4-27, 1990 edition of Table 4).

Table 25);

- e) The requirement for the density of lead glass was removed, and the mass of lead glass was deducted from the minimum reference mass of the component (see 1990 edition).

Tables 11, 12, 21, and 22);

f) The distinction between left and right sides in the names of end bricks has been removed (see Table 6 in the 1990 edition);

g) Added serial numbers for perforated bricks compatible with windows, ball bearing components, plugs, and constriction components (see 6.8~6.11, 7.8~7.11).

This document is modified to adopt ISO 7212:1986 "Ionizing radiation shielding for lead shielding components for walls 50 mm and 100 mm thick".

This document has undergone the following structural adjustments compared to ISO 7212:1986.

---Added Chapter 2 "Normative References" and Chapter 3 "Terms and Definitions";

---Chapter 4 corresponds to Chapter 3 of ISO 7212:1986;

- 4.1 and 4.2 correspond to 3.1 of ISO 7212:1986;

- 4.3 corresponds to 3.2 of ISO 7212:1986.

The technical differences between this document and ISO 7212:1986, and the reasons therefor, are as follows.

---The terms and definitions for "lead shielding components," "antimony content," and "wedge-shaped joint" have been added (see Chapter 3) to adapt to my country's technical conditions;

---The relevant content regarding "Category 3. Acceptable components during the transition period" in ISO 7212:1986 has been deleted (see ISO 7212.

(Chapters 2, 6, and 8 of 1986). Because Category 3 components are outdated transitional models from when the ISO standard was published, they are no longer...

Adapt to current production and usage requirements;

---Change "approximate mass" to "minimum reference mass" and correct the mass of the component (see Tables 4-27, ISO 7212:1986).

(Tables 4-46). This allows for more precise guidance in production and acceptance, and, combined with domestic material density and processing technology, improves the quality of components.

The quantity has been recalculated;

---The specific requirements for lead glass have been removed (see 5.8.4 and 7.8.2 in ISO 7212:1986), and the quality requirements for window components have been changed.

The weight of the glass was deducted (see Tables 13 and 24, and Tables 16, 17, 39, and 40 of ISO 7212:1986). Lead glass as...

Purchased components, whose density varies depending on the grade, are no longer uniformly limited in the lead shielding component standard; excluding the weight of lead glass...

To determine the metal weight of the lead components themselves, so as to facilitate engineering installation and trade settlement.

---The naming convention for end bricks has been changed, no longer forcibly distinguishing between "left" and "right" (see Tables 6 and 9, Table 7 of ISO 7212:1986).

Table 32). To simplify naming, in actual use, left and right can be interchanged simply by flipping the table (except in special cases), reducing redundancy.

describe.

The following editorial changes have been made to this document.

---To harmonize with existing standards, the standard name has been changed to "Lead shielding for 50mm and 100mm thick walls for protection against ionizing radiation".

"Shielding Components";

---Change the hand-drawn illustrations in ISO 7212:1986 to engineering drawings (see Figures 1-29);

---Editing errors in some tables have been corrected, and the order of some clauses has been adjusted to make the logic clearer.

This document was proposed and is under the jurisdiction of the National Nuclear Energy Standardization Technical Committee (SAC/TC58).

1 Scope

This document specifies the designations for lead shielding components used in 50mm and 100mm thick lead shielding walls for protection against X-ray and gamma-ray ionizing radiation.

Specifications, structural dimensions, and tolerances.

This document applies to locations requiring protection against X and gamma radiation.

2 Normative references

This document has no normative references.

3 Terms and Definitions

The following terms and definitions apply to this document.

Lead shielding units Standardized unit modules cast from lead-antimony alloy for assembling lead-shielded walls.

Note: Divided into basic components and functional components. Basic components include. flat bricks, corner bricks, end bricks, special bricks, and columns; functional components include. perforated bricks, windows, and ball bearings.

Components, plugs, and shrinkage components.

Antimony content

The mass fraction of antimony added to lead shielding components.

wedge joint

The wedge-shaped structure on the lead shielding component is used for interconnection and to prevent beam leakage.

4.1 Composition of Codes

The designation of a lead shielding component consists of the component name, serial number, and document number.

4.2 Serial Number

The serial number consists of one number, one letter, one number, and a three-digit sequence, for example, 2V0202.

---The first number indicates the thickness of the lead shielding component. 1 indicates 50mm, 2 indicates 100mm;

---The letter V indicates that the joint of the component is wedge-shaped;

---The second number indicates the assembly direction (see 5.1.2). 1 indicates assembly direction (1), 2 indicates assembly direction (2), and 0 indicates there are two.

Assembly direction;

---The last three digits represent the specific number of components of different sizes. The component series numbering allocation is shown in Table 1.