

ICS 73.010

SN

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

SN/T 1537-2023

**Rules for the inspection of radioactivity of imported minerals
(English Translation)**

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Foreword

This document is drafted in accordance with the provisions of GB/T 1.1-2020 "Directives for standardization - Part 1: Rules for the structure and drafting of standardizing documents".

This document replaces SN/T 1537-2005 "Rules of radioactivity inspection for import minerals". Compared with SN/T 1537-2005, in addition to structural adjustments and editorial changes, the main technical changes are as follows:

- a) DELETE the definition of inspection lot (see Chapter 3; 3.1 of the 2005 edition);
- b) CHANGE the description of instruments and equipment (see 4.2; 4.2 of the 2005 edition);
- c) CHANGE the description of the standard for inspection personnel protection (see 4.3; 4.3 of the 2005 edition);
- d) CHANGE the background measurement method (see 4.4.1; 4.4.1 of the 2005 edition);
- e) ADD the calculation method of dose equivalent rate (see 4.4.2);
- f) CHANGE the radioactivity measurement method (see 4.4.3 and 4.4.4; 4.4.2 and **4.4.3 of the 2005 edition**);
- g) ADD radionuclide activity concentration test (see 4.4.5);
- h) CHANGE the judgment of test results (see Chapter 5; Chapter 5 of the 2005

edition);

i) ADD the requirements for natural radioactivity test and conformity assessment of non-ferrous metal mineral products, such as copper, lead, zinc, tin, nickel, cobalt (see 5.1).

Please note that some contents of this document may involve patents. The issuing agency of this document does not assume the responsibility for identifying patents.

This document was proposed by and shall be under the jurisdiction of the General Administration of Customs of the People's Republic of China.

The drafting organizations of this document: Qingdao Customs of the People's Republic of China, Huangdao Customs of the People's Republic of China, Yantai Customs of the People's Republic of China.

1 Scope

This document specifies the inspection methods and result determination of radioactivity of imported mineral products.

This document applies to radioactivity inspection of imported mineral products transported by container or bulk.

2 Normative references

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

GB/T 4835.1 Radiation protection instrumentation - Ambient and/or directional dose equivalent (rate) meters and/or monitors for beta, X, gamma radiation - Part 1: Portable

workplace and environmental meters and monitors

GB/T 4960.5 Glossary of terms: Nuclear science and technology - Radiation protection and safety of radiation sources

GB 18871 Basic standards for protection against ionizing radiation and for the safety of radiation sources

GB 20664 Limitation concentration of natural radioactivity in nonferrous metal ores and concentrates products

GB 27742 Activity concentration for material not requiring radiological regulation

3 Terms and definitions

The terms and definitions as defined in GB/T 4960.5 apply to this document.

4.4.3.1.2 Place the probe of the detector close to the outer wall of the container. Find

the highest point of the gamma-ray dose equivalent rate on each surface. Repeat the measurement 5 times (10s interval) at the highest point of each surface. Take the average value of the 5 measurements as the gamma-ray dose equivalent rate of the surface.

4.4.3.1.3 Take the highest equivalent rate in the entire detection process as the gamma-ray

dose equivalent rate of the inspected products.

4.4.3.1.4 If the gamma-ray dose equivalent rate on any surface measured outside the box

exceeds 5 times the environmental radiation background value, the box shall be opened for inspection.

4.4.3.2 Container unpacking measurement

Open the container door. Place the probe of the detector 10 cm away from the mineral product, to find the highest point of the gamma-ray dose equivalent rate. Repeat the measurement 5 times (10s interval) at the highest point. Take the average value of the

4.4.4.1.1 For bulk mineral products transported by ship, for batches below 1500 t, at

least 4 inspections shall be conducted at the beginning of unloading, when 1/3, 2/3 of the total cargo is unloaded, and at the end of unloading; for batches above 1500 t, a

measurement shall be conducted every 500 t.

4.4.4.1.2 Use the grab bucket of the loading and unloading machinery to randomly grab

not less than 50 t of mineral products from different parts of the cargo surface in the hold; bring them to the inspection site. Pile them into a flat cargo pile with a thickness of ≥ 1 m and a top diameter of ≥ 2 m. Place the probe of the detector at 0.1 m above the top surface of the cargo pile. Find the highest point of the gamma-ray dose equivalent rate;. Repeat the measurement 5 times (10s interval) at the highest point. Take the average value of the 5 measurements as the gamma-ray dose equivalent rate of the batch of mineral

products measured at that time.

4.4.4.1.3 Take the highest equivalent rate in the entire detection process as the gamma-ray

dose equivalent rate of the inspected goods.

4.4.4.2 Bulk mineral products transported by land

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