ICS 13.300
CCS F 73

NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GB/T 43257.4-2024

Safety test methods for transport packages of radioactive material-Part 4: Drop test

放射性物品运输容器安全试验方法 第4部分：跌落试验

Issued on: December 31, 2024 **Implemented on: July 1, 2025**

Issued by: State Administration for Market Regulation;
Standardization Administration of the PRC

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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 for standardization documents" Drafting.

This document is part 4 of GB/T 43257 "Safety test methods for transport containers of radioactive materials". GB/T 43257 has been published The following parts.

- Part 1: General;

- Part 4: Drop test;

- Part 6: Heat resistance test.

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

This document was proposed and coordinated by the National Nuclear Energy Standardization Technical Committee (SAC/TC58).

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Introduction

The inherent safety of radioactive material transport containers is the prerequisite for the safety of radioactive material transportation.

Verification of various tests under accident conditions.

GB/T 43257 provides various verification tests for different types of transport containers. It is necessary to clarify the status of the test containers and the detailed test conditions.

The test conditions, test equipment and instruments, test implementation and testing, data processing methods, test qualification evaluation and many other specific contents are GB 11806-2019 is an important supplement to the implementation, making the relevant test assessment more specific and standardized.

The container safety test method specifically guides various types of transport containers to carry out corresponding verification tests, which is of great significance to the design, verification and evaluation of containers. Very important significance.

GB/T 43257 is intended to consist of 11 parts.

- Part 1: General. The purpose is to clarify the conditions under which radioactive material transport containers are subjected to normal transport conditions and transport accident conditions.

The following are general requirements for various tests.

- Part 2: Water spray test. The purpose is to standardize and guide the radioactive material transport container to withstand the water spray test under normal transport conditions. Test and assessment.

- Part 3: Stacking test. The purpose is to standardize and guide the radioactive material transport container to withstand the stacking test under normal transport conditions. Test and assessment.

- Part 4: Drop test. The purpose is to standardize and guide the radioactive material

transport container to withstand normal transport conditions and transport accidents Free fall, penetration and puncture-tear tests under certain conditions.

- Part 5: Impact test. The purpose is to standardize and guide the impact test of radioactive material transport containers under transportation accident conditions. Test and assessment.

- Part 6: Heat resistance test. The purpose is to standardize and guide the heat resistance and Strengthen heat resistance test assessment.

- Part 7: Water immersion test. The purpose is to standardize and guide the radioactive material transport container to withstand water immersion under transportation accident conditions No and strengthened water immersion test assessment.

- Part 8: Leakage test. The purpose is to standardize and guide the radioactive material transport container to withstand normal transport conditions and transport accidents Leakage test under conditions.

- Part 9: Shielding test. The purpose is to standardize and guide the radioactive material transport container to withstand normal transport conditions and transport accidents Shielding test after conditioning.

- Part 10.Vibration test. The purpose is to standardize and guide the vibration test of the transport vibration effect of radioactive material transport containers Assessment.

- Part 11.Heat transfer test. The purpose is to standardize and guide the radioactive material transport container and not to ignore the decay heat effect of the contents Heat transfer test assessment.

GB/T 43257.4 is to verify the ability of cargo packages to withstand typical transportation environments and accident environments, and to test their shielding, containment, subcriticality, This part includes free fall test and penetration test under normal transport conditions.

Mechanical tests under transportation accident conditions [free fall test I (9m drop), free fall test II (puncture), free fall test III (dynamic GB/T 43257.4 and GB/T 43257.1 together constitute the standard applicable to Drop test method for obtaining evidence from radioactive material transport containers.

Safety test methods for radioactive material transport containers Part 4: Drop test

1 Scope

This document describes the test specimen, method summary, test conditions, instrumentation, test procedures, and test methods for the drop test of radioactive material transport containers.

Verification data processing, quality assurance and control, etc.

This document applies to the drop test of radioactive material transport containers, i.e. free fall test and penetration test under normal transport conditions.

Free fall test I, free fall test II, free fall test III and additional test for type C cargo package under transport accident conditions Puncture-tear test.

2 Normative references

GB/T 4857.1

GB 11806

GB/T 43257.1-2023

3 Terms and definitions

The terms and definitions defined in GB 11806 and GB/T 43257.1-2023 and the following apply to this document.

3.1 dropposture

The posture of the sample when it falls and hits the target.

Note. It is generally described by the target impact angle, that is, the angle between the specimen axis or other specified characteristic line and the target surface.

3.2 penetration stick

A cylindrical solid steel bar with a diameter of 3.2 cm, a hemispherical end and a mass of 6 kg, used for penetration tests under normal transportation conditions.

3.3 Puncture stick

Used for free fall test II under transport accident conditions, the diameter is (15±0.5) cm, the length is 20 cm, the top of the rod is flat and watertight A cylindrical solid mild steel bar with a flat surface and rounded edges with a radius not exceeding 6 mm.

3.4 Dynamic Crushing Board dynamiccrushingboard

For free fall test under transport accident conditions III, solid low-carbon steel plate with size 1mx1m and mass 500kg, steel plate The bottom edge and corners are arc-shaped, and the radius of the fillet is not greater than 6mm.