

ICS 13.280
CCS F 84



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

GB/T 34138-2025

Replacing GB/T 34138-2017

**Radiation protection instrumentation - Recommended climatic,
electromagnetic and mechanical performance requirements
and methods of tests**

辐射防护仪器 环境、电磁和机械性能要求以及试验方法
(English Translation)

Issued on: May 30, 2025

Implemented on: December 1, 2025

**Issued by: State Administration for Market Regulation, China National
Standardization Administration**

Table of Contents

Preface	
Introduction	
1 Scope	
2 Normative references	
3 Terms and definitions, abbreviations, quantities and units	
3.1 Terms and Definitions	
3.2 Abbreviations	
3.3 Quantities and units	
4 General requirements	
5 General test methods	
5.1 Nature of the test	
5.2 Standard test conditions	
5.3 Use of this document	
6 Radiation Detection Requirements	
7 Environmental Requirements	
7.1 General	
7.2 Ambient temperature	
7.3 Temperature shock	
7.4 Low temperature/high temperature start	
7.5 Relative humidity	
7.6 IP (Protection Grade) Classification	
7.7 Other Environments and Long-term Installations	
8 Mechanical requirements	
8.1 General	
8.2 Drop	
8.3 Vibration test	
8.4 Flutter/Crash	
8.5 Mechanical shock	
9 Electromagnetic compatibility requirements	
9.1 Overview of recommended settings	
9.2 Electrostatic Discharge	
9.3 Radio Frequency Immunity	

9.4 Radiated Emissions

9.5 Magnetic Field

9.6 AC Line Power Supply Equipment Requirements

10 File

Appendix A (Informative) Identification of mutually orthogonal (perpendicular) planes

Reference

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 replaces GB/T 34138-2017 "Environmental, electromagnetic and mechanical performance requirements for radiation protection instruments" and GB/T 34138-Compared with 2017, in addition to structural adjustments and editorial changes, the main technical changes are as follows.

- a) The definitions of some terms have been changed (see 3.1.8, 3.1.9, 3.1.7 and 3.1.8 of the 2017 edition);
- b) The details of the selected test methods have been changed (see 7.2.2, 7.3.2, 7.4.2, 7.5.2, 7.6.2, 2017 edition 7.2.2, 7.3.2, 7.5.2, 7.4.2, 7.6.2);
- c) Added guidance and recommendations for equipment and instrumentation settings (see 7.2.3, 7.3.3, 7.5.3, 7.6.3, 7.7, 8.4.4, 8.5.3, 9.2.3, 8.5.3, 9.6.1.3, 9.6.2.3).

This document is modified to adopt IEC 62706:2019 "Environmental, electromagnetic and mechanical performance requirements and test methods for radiation protection equipment".

The technical differences between this document and IEC 62706:2019 and their reasons are as follows.

--- Use normative references GB/T 2423.1, GB/T 2423.2, GB/T 2423.5, GB/T 2423.22, GB/T 2423.24, GB/T 2423.37, GB/T 2423.38, GB/T 2423.4, GB/T 2423.56, GB/T 2900.97, GB/T 4208, GB/T 4797.3, GB/T 4798.4, GB/T 4798.5, GB/T 17626.2, GB/T 17626.3, GB/T 17626.5, GB/T 17626.6, GB/T 17626.8, GB/T 17626.12 replaced IEC 60068-2-1, IEC 60068-2-2, IEC 60068-2-27, IEC 60068-2-14, IEC 60068-2-5, IEC 60068-2-68, IEC 60068-2-18, IEC 60068-2-66, IEC 60068-2-64, IEC 60050-395, IEC 60529, IEC 60721-2-7, IEC 60721-3-4, IEC 60721-3-5, IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-12, provided Operability;

--- Added the term "gravitational acceleration" (see 3.1.2) to adapt to my country's technical

conditions and provide operability;

--- The abbreviation CISPR (see 3.2) has been deleted to adapt to my country's technical conditions and provide operability;

--- Deleted the normative reference to IEEE/ANSI 63.4, and changed the references to IEEE/ANSI 63.4 and CISPR the content is changed to "The test should be carried out in a qualified laboratory" (see 9.4.3) to adapt to my country's technical conditions and provide operability.

Introduction

Radiation protection instrumentation, including instruments for the detection and identification of radioactive materials and radionuclides, is used in many different environments.

During normal use, radiation protection equipment is typically exposed to varying temperatures, humidity, electromagnetic fields and mechanical stresses (e.g. shock and vibration).

Radiation instruments may be wearable, handheld, vehicle mounted, moved from one location to another, or fixedly installed.

All conditions related to various uses. In order to ensure consistency between standards, for environmental, electromagnetic and mechanical performance requirements are established.

Radiation Protection Instrumentation Environmental, Electromagnetic and Mechanical Performance requirements and test methods

1 Scope

This document specifies the environmental, mechanical and electromagnetic performance requirements and test methods for radiation protection equipment. This document also provides some test Guidance is provided for the setup of test equipment and the instrument under test (IUT).

This document applies to body-worn (e.g. personal radiation detectors, backpacks and dosimeters), hand-held, transportable, mobile Tabletop and fixed instruments.

NOTE: The purpose of this document is to specify the possible use environment of radiation protection equipment for the design and testing of the equipment.

2 Normative references

The contents of the following documents constitute essential clauses of this document through normative references in this document.

For referenced documents without a date, only the version corresponding to that date applies to this document; for referenced documents without a date, the latest version (including all amendments) applies to this document.

GB/T 2423.1 Environmental testing for electric and electronic products Part 2: Test methods Test A. Low temperature (GB/T 2423.1-2008, IEC 60068-2-1:2007, IDT) GB/T 2423.2 Environmental testing for electric and electronic products Part 2: Test methods Test B. High temperature (GB/T 2423.2-2008, IEC 60068-2-2:2007, IDT) GB/T 2423.5 Environmental testing Part 2: Test method Test Ea and guidance. Impact (GB/T 2423.5-2019, IEC 60068-2-27:2008, IDT) GB/T 2423.22 Environmental testing Part 2: Test method Test N. Temperature change (GB/T 2423.22-2012, IEC 60068-2-14:2009, IDT) GB/T 2423.24 Environmental testing Part 2: Test methods Test S. Simulated ground solar radiation and solar radiation test and weathering test guidelines (GB/T 2423.24-2022, IEC 60068-2-5:2018, IDT) GB/T 2423.37 Environmental testing for electric and electronic products Part 2: Test methods Test L. Dust test (GB/T 2423.37-2006, IEC 60068-2-68:1994, IDT) GB/T 2423.38 Environmental testing Part 2: Test methods Test R. Water test methods and guidance (GB/T 2423.38-2021, IEC 60068-2-18:2017, IDT) GB/T 2423.40 Environmental testing Part 2: Test methods Test Cx. Unsaturated high pressure steam steady state wet heat (GB/T 2423.40-2013, IEC 60068-2-66:1994, IDT) GB/T 2423.56 Environmental testing Part 2: Test method Test Fh. Broadband random vibration and guidance (GB/T 2423.56-2023, IEC 60068-2-64:2019, IDT) GB/T 2900.97 Electrical terminology Nuclear instruments. Physical phenomena, basic concepts, instruments, systems, equipment and detectors (GB/T 2900.97-2016, IEC 60050-395:2014, IDT) GB/T 4208 Degrees of protection provided by enclosures (IP code) (GB/T 4208-2017, IEC 60529:2013, IDT) GB/T 4797.3 Classification of environmental conditions Natural environmental conditions Part 3: Biological (GB/T 4797.3-2024, IEC 60721-2-7:2018, MOD) GB/T 4798.4 Classification of environmental conditions Classification of environmental parameter groups and their severity classification Part 4: Locations without weather protection