IEC 62706

Edition 2.0 2019-11

INTERNATIONAL STANDARD

NORME INTERNATIONALE

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

Instrumentation pour la radioprotection – Exigences recommandées en matière de performances climatiques, électromagnétiques et mécaniques et méthodes d'essai

IEC 62706:2019-11(en-fr)

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RADIATION PROTECTION INSTRUMENTATION – RECOMMENDED CLIMATIC, ELECTROMAGNETIC AND MECHANICAL PERFORMANCE REQUIREMENTS AND METHODS OF TESTS

FOREWORD

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International Standard IEC 62706 has been prepared by subcommittee 45B: Radiation protection instrumentation, of IEC technical committee 45: Nuclear instrumentation.

This second edition cancels and replaces the first edition, issued in 2012. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

a) addition of more details to selected methods of test;
b) revised radio frequency testing requirements based on measurements made at various locations;
c) added equipment and instrument setup guidance and recommendations.

The text of this International Standard is based on the following documents:

FDIS	Report on voting
45B/942/FDIS	45B/947/RVD

Full information on the voting for the approval of this International Standard can be found in the report on voting indicated in the above table.

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under "http://webstore.iec.ch" in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

INTRODUCTION

Radiation protection instrumentation including those instruments used for the detection and identification of radioactive material and radionuclides are used in many different environments. They are typically exposed to different temperatures, humidity levels, electromagnetic fields, and mechanical stresses such as shock and vibration during normal use. Radiation detection instrumentation may be worn on the body, handheld, mounted to a vehicle, transported from location to location, or installed. All the conditions associated with these very different uses are considered when developing instrument-specific requirements. To ensure consistency between standards, this climatic, electromagnetic, and mechanical performance requirements standard was established.

RADIATION PROTECTION INSTRUMENTATION – RECOMMENDED CLIMATIC, ELECTROMAGNETIC AND MECHANICAL PERFORMANCE REQUIREMENTS AND METHODS OF TESTS

1 Scope

This document recommends the climatic, mechanical and electromagnetic performance requirements and methods of test for radiation protection instrumentation. This document also provides guidance regarding the setup of test equipment and instruments under test (IUT) for certain tests.

The object of this document is to define, for design and test purposes, the environments in which radiation protection instrumentation may be exposed. The environments addressed by this document are applicable to body-worn (e.g., personal radiation detectors, backpack, and dosemeters), handheld, transportable, mobile, and installed instrumentation.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60050-395:2014, *International Electrotechnical Vocabulary (IEV) – Part 395: Nuclear instrumentation – Physical phenomena, basic concepts, instruments, systems, equipment and detectors*

IEC 60068-2-1*, Environmental testing – Part 2-1: Tests – Test A: Cold*

IEC 60068-2-2, *Environmental testing – Part 2-2: Tests – Test B: Dry heat*

IEC 60068-2-5, *Environmental testing – Part 2-5: Tests – Test S: Simulated solar radiation at ground level and guidance for solar radiation testing and weathering*

IEC 60068-2-14, *Environmental testing – Part 2-14: Tests – Test N: Change of temperature*

IEC 60068-2-18, *Environmental testing – Part 2-18: Tests – Test R and guidance: Water*

IEC 60068-2-27, *Environmental testing – Part 2-27: Tests – Test Ea and guidance: Shock*

IEC 60068-2-64, *Environmental testing – Part 2-64: Tests – Test Fh: Vibration, broadband random and guidance*

IEC 60068-2-66, *Environmental testing – Part 2-66: Test methods – Test Cx: Damp heat, steady state (unsaturated pressurized vapour)*

IEC 60068-2-68, *Environmental testing – Part 2-68: Tests – Test L: Dust and sand*

IEC 60529*, Degrees of protection provided by enclosures (IP code)*

IEC 60721-2-7, *Classification of environmental conditions – Part 2-7: Environmental conditions appearing in nature. Fauna and flora*

IEC 60721-3-4, *Classification of environmental conditions – Part 3-4: Classification of groups of environmental parameters and their severities – Stationary use at non-weather protected locations*

IEC 60721-3-5, *Classification of environmental conditions – Part 3-5: Classification of groups of environmental parameters and their severities – Section 5: Ground vehicle installations*

IEC 61000-4-2, *Electromagnetic compatibility (EMC) – Part 4-2: Testing and measurement techniques – Electrostatic discharge immunity test*

IEC 61000-4-3, *Electromagnetic compatibility (EMC) – Part 4-3: Testing and measurement techniques – Radiated, radio-frequency, electromagnetic field immunity test*

IEC 61000-4-5, *Electromagnetic compatibility (EMC) – Part 4-5: Testing and measurement techniques – Surge immunity test*

IEC 61000-4-6, *Electromagnetic compatibility (EMC) – Part 4-6: Testing and measurement techniques – Immunity to conducted disturbances, induced by radio-frequency fields*

IEC 61000-4-8, *Electromagnetic compatibility (EMC) – Part 4-8: Testing and measurement techniques – Power frequency magnetic field immunity test*

IEC 61000-4-12, *Electromagnetic compatibility (EMC) – Part 4-12: Testing and measurement techniques – Ring wave immunity test*

IEEE/ANSI C63.4, *American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz*

3 Terms and definitions, abbreviated terms and symbols, quantities and units

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60050-395, as well as the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at http://www.electropedia.org/
- ISO Online browsing platform: available at http://www.iso.org/obp

3.1.1
body-worn instruments
radiation detection instruments that are worn on the trunk or the extremities of the body while being used

3.1.2
g_n
standard acceleration due to the earth's gravity, which itself varies with altitude and geographical latitude

3.1.3
handheld or portable instruments
radiation detection instruments that are used while being held