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Linear accelerator - Electron linear accelerator for radiation processing - Part 1: General requirement and test methods

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Linear accelerator - Electron linear accelerator for radiation processing - Part 1: General requirements and test methods

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

Draft	Report on voting
45/1036XX/FDIS	45/1051XX/RVD

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

A list of all parts in the IEC 63589 series, published under the general title *Linear accelerator - Electron linear accelerator for radiation processing*, can be found on the IEC website.

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

– reconfirmed,

– withdrawn, or

– revised.

INTRODUCTION

An electron linear accelerator for radiation processing is a device that generates a high-energy electron beam through a linear radio frequency resonant structure. The accelerator device has the advantages of no toxicity or radiation residue, high radiation efficiency, and easy operation and control. It is an important equipment for radiation sterilization, radiation modification, radiation solidification, radiation degradation, agricultural breeding, and other radiation-processing fields.

1 Scope

This document specifies the general requirements and test methods of radiation processing electron linear accelerator device. The rules of naming, technical requirements, test methods, inspection rules, marking, packaging, storage, and transportation requirements are also provided.

This document applies to the electron linear accelerators for radiation processing with energy 1,0 MeV to 15 MeV.

NOTE Linear accelerators described in this document produce electron beams used for radiation processing. Please see IEC 62976 for accelerators producing X-ray bremsstrahlung used for non-destructive testing.

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 60364-1:2025, *Low-voltage electrical installations - Part 1: Fundamental principles, assessment of general characteristics, and definitions*

IEC 61000-4-4, *Electromagnetic compatibility (EMC) - Part 4-4: Testing and measurement techniques - Electrical fast transient/burst immunity test*

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

IEC 61000-6-2, *Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity standard for industrial environments*

IEC 61000-6-4, *Electromagnetic compatibility (EMC) - Part 6-4: Generic standards - Emission standard for industrial environments*

ISO 780, *Packaging - Distribution packaging - Graphical symbols for handling and storage of packages*

ISO/IEC Guide 37, *Instructions for use of products by consumers*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

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

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

3.1
radiation processing
intentional irradiation of products or materials to preserve, modify or to improve their characteristics

[SOURCE: ISO/ASTM 52628:2020, 3.1.14]