Electrostatics - Part 4-7: Standard test methods for specific applications - Ionization

EESTI STANDARDIMIS- JA AKREDITEERIMISKESKUS
ESTONIAN CENTRE FOR STANDARDISATION AND ACCREDITATION

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN IEC 61340-4-7:2025 sisaldab Euroopa standardi EN IEC 61340-4-7:2025 ingliskeelset teksti.	This Estonian standard EVS-EN IEC 61340-4-7:2025 consists of the English text of the European standard EN IEC 61340-4-7:2025.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas.	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation and Accreditation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 03.10.2025.	Date of Availability of the European standard is 03.10.2025.
Standard on kättesaadav Eesti Standardimis-ja Akrediteerimiskeskusest.	The standard is available from the Estonian Centre for Standardisation and Accreditation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile standardiosakond@evs.ee.

ICS 17.200.99, 29.020

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Electrostatics - Part 4-7: Standard test methods for specific applications - Ionization (IEC 61340-4-7:2025)

Electrostatique - Partie 4-7 : Méthodes d'essai normalisées pour des applications spécifiques - Ionisation (IEC 61340-4-7:2025)

Elektrostatik - Teil 4-7: Standard-Prüfverfahren für spezielle Anwendungen - Ionisation (IEC 61340-4-7:2025)

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Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

European foreword

The text of document 101/739/FDIS, future edition 3 of IEC 61340-4-7, prepared by TC 101 "Electrostatics" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 61340-4-7:2025.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2026-10-31
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Endorsement notice

The text of the International Standard IEC 61340-4-7:2025 was approved by CENELEC as a European Standard without any modification.

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INTERNATIONAL STANDARD

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Electrostatics - Part 4-7: Standard test methods for specific applications - Ionization

FOREWORD

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IEC 61340-4-7 has been prepared by IEC technical committee 101: Electrostatics. It is an International Standard.

This third edition cancels and replaces the second edition published in 2017. This edition constitutes a technical revision.

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

a) in Figure 5, a NOTE 3 was added to clarify that for AC bars and grids, a single emitter alternating between +/− polarity is used;
b) in Annex B, the relative error for measurement equipment was updated to include the consideration for the resolution of the voltmeter.

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

Draft	Report on voting
101/739/FDIS	101/744/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 61340 series, published under the general title *Electrostatics*, 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

Grounding is the primary method used to limit static charge when protecting electrostatic discharge sensitive items in the work environment. However, grounding methods are not effective in removing static charges from the surfaces of non-conductive (insulative) or isolated (ungrounded) conductive materials. Air ionization techniques, by means of ionizer systems, can be utilized to reduce this charge.

The preferred way of evaluating the ability of an ionizer to neutralize a static charge is to directly measure the rate of charge decay. Charges to be neutralized can be located on insulators as well as on isolated conductors. It is difficult to charge an insulator reliably and repeatably. Charge neutralization is more easily evaluated by measuring the rate of decay of the voltage of an isolated conductive plate. The measurement of this decay should not interfere with or change the nature of the actual decay. Four practical methods of air ionization are addressed in this document:

a) radioactive emission;

b) high-voltage corona from AC electric fields;

c) high-voltage corona from DC electric fields;

d) soft X-ray emission.

This part of IEC 61340 provides test methods and procedures that can be used when evaluating ionization equipment. The objective of the test methods is to generate meaningful, reproducible data. The test methods are not meant to be a recommendation for any particular ionizer configuration. The wide variety of ionizers, and the environments within which they are used, will often require test methods different from those described in this document. Users of this document should be prepared to adapt the test methods as required to produce meaningful data in their own application of ionizers.

Similarly, the test conditions chosen in this document do not represent a recommendation for acceptable ionizer performance. There is a wide range of item sensitivities to static charge. There is also a wide range of environmental conditions affecting the operation of ionizers. Performance specifications should be agreed upon between the user and manufacturer of the ionizer in each application. Users of this document should be prepared to establish reasonable performance requirements for their own application of ionizers.

Annex B provides a method for measuring capacitance of the isolated conductive plate.

1 Scope

This part of IEC 61340 provides test methods and procedures for evaluating and selecting air ionization equipment and systems (ionizers).

This document establishes measurement techniques, under specified conditions, to determine offset voltage (ion balance) and decay (charge neutralization) time for ionizers.

This document does not include measurements of electromagnetic interference (EMI), or the use of ionizers in connection with ordnance, flammables, explosive items or electrically initiated explosive devices.

As contained in this document, the test methods and test conditions can be used by manufacturers of ionizers to provide performance data describing their products. Users of ionizers are urged to modify the test methods and test conditions for their specific application in order to qualify ionizers for use, or to make periodic verifications of ionizer performance. The user will decide the extent of the data required for each application.

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 61010-1, *Safety requirements for electrical equipment for measurement, control, and laboratory use - Part 1: General requirements*

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
air conductivity
ability of air to conduct (pass) an electric current under the influence of an electric field

3.2
air ions
molecular clusters of about ten molecules (water, impurities, etc.) bound by polarization forces to a singly charged oxygen or nitrogen molecule

3.3
charge decay
decrease or neutralization or both of a net electrostatic charge