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Electrostatics -
Part 5-4: Protection of electronic devices from electrostatic phenomena - Compliance verification

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IEC Secretariat
3, rue de Varembé
CH-1211 Geneva 20
Switzerland

Tel.: +41 22 919 02 11
info@iec.ch
www.iec.ch

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Electrostatics - Part 5-4: Protection of electronic devices from electrostatic phenomena - Compliance verification

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IEC TS 61340-5-4 has been prepared by IEC technical committee 101: Electrostatics. It is a Technical Specification.

This second edition cancels and replaces the first edition published in 2021. This edition constitutes a technical revision.

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

a) significant new revision;

b) document has been updated and reformatted.

The text of this Technical Specification is based on the following documents:

Draft	Report on voting
101/756/DTS	101/761/RVDTS

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 Technical Specification 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– withdrawn, or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

Compliance verification is the process of monitoring and measuring all elements of an ESD control program. Regular compliance verification checks and tests are an essential part of this process, ensure that area precautions and equipment remain effective, and that an ESD control program is correctly implemented in compliance with an organization's ESD control program plan.

Qualification testing is typically carried out under controlled conditions, often in a laboratory environment, and using industry recognized standards. Compliance verification testing is carried out under operational conditions using test methods that are appropriate to a user's requirements. Although qualification test methods can be used, compliance verification testing often uses simple equipment and procedures. Accuracy is still important, but of equal importance is the ability to carry out non-destructive testing without interrupting the normal business of the organization.

This document describes equipment and test methods that can be used for compliance verification testing of ESD control items and systems and provides users with troubleshooting guidance regarding the verification procedures for the ESD control items.

1 Scope

This part of IEC 61340 describes compliance verification testing for technical items included in ESD control programs, such as those specified in IEC 61340-5-1.

Test methods are based on those specified in IEC 61340-5-1 and other parts of the IEC 61340 series and are simplified, where appropriate, for the purposes of compliance verification.

This document describes compliance verification procedures intended for use by competent personnel familiar with the operation of test equipment and knowledgeable about the ESD control items being verified.

Organizations can, by reference to this document in their compliance verification plan, adopt the necessary compliance verification procedures described herein without change or addition. Alternatively, compliance verification procedures described in this document can be adapted to match the organization's ESD control program requirements, provided deviations in test equipment and compliance verification procedures are documented in their compliance verification plan.

Product qualification is excluded from the scope of this document.

NOTE 1 For additional information regarding common failure modes of ESD control items, see IEC TR 61340-5-2 [1][1].

NOTE 2 For additional information regarding the reproducibility of measurement results, see IEC TR 61340-1-1 [2].

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*

IEC 61010-2-030, *Safety requirements for electrical equipment for measurement, control, and laboratory use - Part 2-030: Particular requirements for equipment having testing or measuring circuits*

IEC 61340-2-3, *Electrostatics - Part 2-3: Methods of test for determining the resistance and resistivity of solid materials used to avoid electrostatic charge accumulation*

IEC 61340-4-7, *Electrostatics - Part 4-7: Standard test methods for specific applications - Ionization*

IEC 61340-5-1, *Electrostatics - Part 5-1: Protection of electronic devices from electrostatic phenomena - General requirements*

IEC 62631-3-2, *Dielectric and resistive properties of solid insulating materials - Part 3-2: Determination of resistive properties (DC methods) - Surface resistance and surface resistivity*

ISO 1853, *Conducting and dissipative rubbers, vulcanized or thermoplastic - Measurement of resistivity*

[1] Numbers in square brackets refer to the Bibliography.

ISO 48-4, *Rubber, vulcanized or thermoplastic - Determination of hardness - Part 4: Indentation hardness by durometer method (Shore hardness)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in the documents listed in Clause 2 and the following 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
common connection point
device or location where the conductors of two or more ESD control items are connected in order to bring the ESD control items to the same electrical potential through equipotential bonding

3.2
compliance verification
testing conducted to indicate that the performance has not changed from initial baseline values to exceed selected limits

3.3
equipotential bond
electrical connection of conductive parts (or items used to control ESD) so that they are the same electrical potential under normal operational conditions

3.4
ESD control items
materials or products designed to prevent the generation of static charge and/or dissipate static charges that have been generated to prevent damage to ESD sensitive devices

3.5
ESD ground
terminal used to connect parts to ground for ESD control purposes

3.6
ESD protected area
EPA
area in which an ESDS can be handled with accepted risk of damage because of electrostatic discharge or fields

3.7
ESD sensitive device
ESDS
sensitive device, integrated circuit or assembly that can be damaged by electrostatic fields or electrostatic discharge

3.8
functional ground
terminal used to connect parts to ground for reasons other than safety