IEC TS 61340-5-4

Edition 2.0 2026-06

TECHNICAL SPECIFICATION

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

ICS 17.220.99; 29.020

ISBN 978-2-8327-1279-5

IEC TS 61340-5-4:2026-06(en)

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

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

About the IEC
The International Electrotechnical Commission (IEC) is the leading global organization that prepares and publishes International Standards for all electrical, electronic and related technologies.

About IEC publications
The technical content of IEC publications is kept under constant review by the IEC. Please make sure that you have the latest edition, a corrigendum or an amendment might have been published.

IEC publications search - webstore.iec.ch/advsearchform
The advanced search enables to find IEC publications by a variety of criteria (reference number, text, technical committee, …). It also gives information on projects, replaced and withdrawn publications.

IEC Just Published - webstore.iec.ch/justpublished
Stay up to date on all new IEC publications. Just Published details all new publications released. Available online and once a month by email.

IEC Customer Service Centre - webstore.iec.ch/csc
If you wish to give us your feedback on this publication or need further assistance, please contact the Customer Service Centre: sales@iec.ch.

IEC Products & Services Portal - products.iec.ch
Discover our powerful search engine and read freely all the publications previews, graphical symbols and the glossary. With a subscription you will always have access to up to date content tailored to your needs.

Electropedia - www.electropedia.org
The world's leading online dictionary on electrotechnology, containing more than 22 500 terminological entries in English and French, with equivalent terms in 25 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

Warning! Make sure that you obtained this publication from an authorized distributor.

CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

_____

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

FOREWORD

1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
6) All users should ensure that they have the latest edition of this publication.
7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
9) IEC draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). IEC takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, IEC had not received notice of (a) patent(s), which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at https://patents.iec.ch. IEC shall not be held responsible for identifying any or all such patent rights.

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

3.9
organization
company, group or body that handles ESDS

Note 1 to entry: For the purposes of this document, an organization can be an individual person.

3.10
protective earth
terminal used to connect parts to earth for safety reasons

3.11
unprotected ESDS
ESDS without ESD control packaging or coverings

3.12
worksurface
working surface
surface where any type of work or processing can be performed on an unprotected ESDS

4 Personnel safety

WARNING - The procedures and equipment described in this document can expose personnel to hazardous electrical conditions. Users of this document are responsible for selecting equipment that complies with applicable laws, regulatory codes and both external and internal policy. This document does not replace or supersede any requirements for personnel safety included in applicable laws, regulatory codes and both external and internal policy.

Electrical hazard reduction practices shall be exercised and proper grounding instructions for equipment shall be followed. Safety requirements for electrical equipment for measurements are given in IEC 61010-1 and IEC 61010-2-030.

5 General aspects

5.1 Use of this document

This document is organized by compliance verification clauses based on the order that the ESD control items are referenced in IEC 61340-5-1. It is separated into general compliance verification objectives; a listing of IEC 61340 series documents that the compliance verification procedure is based upon; and test equipment needed to perform the compliance verification, followed by compliance verification procedures using various test equipment, as applicable. Figures that follow the compliance verification procedures are intended as examples only and should be modified by the user as necessary. The troubleshooting clause offers guidance for addressing common issue with test equipment used in the compliance verification process. For information and guidance on error consideration and uncertainty of measurements, refer to IEC TR 61340-1-1 [2].

Test equipment shall be verified to be working properly before performing compliance verification procedures.

– Initial compliance verification procedures should be applied when the ESD control item is first brought into service. Subsequent compliance verification of the ESD control item should follow the same compliance verification techniques using the same or similar test equipment.

NOTE 1 Changes in the compliance verification procedure or test equipment can provide different results.

– Compliance verification of the ESD control item shall be performed, as appropriate, where the ESDS item is likely to reside or to be handled in the process. The intent is to assess the as-found condition of the ESD control item being verified. There should be no modification (for example, cleaning, rubbing, moving, etc.) of the ESD control item prior to verification.

NOTE 2 For information in determining the risk associated with the ESD control item in an as-used condition, refer to IEC TS 61340-5-6 [3].

Test methods that are not specifically required by IEC 61340-5-1 are described in informative Annex C, Annex D, Annex E, Annex F, Annex G, Annex H and Annex I.

Compliance verification test frequency is not specified in this document. Guidance on how users should consider compliance verification test frequency is given in informative Annex A.

5.2 General troubleshooting

Troubleshooting procedures are provided within this document to assist the end-user in determining common potential failure modes within the compliance verification procedure and/or test equipment.

For troubleshooting common ESD control item failure modes, see IEC TR 61340-5-2 [1].

5.3 Defective ESD control items

ESD control items that cannot be brought into compliance shall be taken out of service and clearly marked or disposed of.

6 Test equipment

6.1 Selection, calibration, and verification of test equipment

If the organization's ESD control program required limits are outside the operating range for the test equipment listed in this clause, the user is responsible for defining and documenting the test equipment used to meet their specific requirements.

Test equipment should be calibrated and operated according to the manufacturer's recommendations.

Before use, verify that the test equipment is operating properly, following the manufacturer's operating instructions. Procedures for verifying commonly used equipment can be found in Annex B.

NOTE Test equipment listed is used to support compliance verification requirements per IEC 61340-5-1.

6.2 AC outlet analyzer (or mains socket tester)

An AC outlet analyzer (or mains socket tester) is a device that plugs into an AC outlet and provides an indication, typically using lights, of whether the outlet is correctly wired, or if a fault condition exists.

For compliance verification testing, an AC outlet analyzer can be used to indicate the correct wiring of the equipment grounding conductor.

NOTE Some AC outlet analyzers are not able to differentiate ground (or earth) and neutral wire reversals, line and neutral wire reversals, and line and ground wire reversals, or determine if the impedance to ground of the equipment grounding conductor is within the user's specification.