

SLOVENSKI STANDARD

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Nadomešča:

SIST EN 61340-5-1:2008

Elektrostatika - 5-1. del: Zaščita elektronskih naprav pred elektrostatskimi pojavi - Splošne zahteve (IEC 61340-5-1:2016)

Electrostatics - Part 5-1: Protection of electronic devices from electrostatic phenomena - General requirements (IEC 61340-5-1:2016)

Elektrostatik - Teil 5-1: Schutz von elektronischen Bauelementen gegen elektrostatische Phänomene - Allgemeine Anforderungen

Electrostatique - Partie 5-1: Protection des dispositifs électroniques contre les phénomènes électrostatiques - Exigences générales

Ta slovenski standard je istoveten z: EN 61340-5-1:2016

ICS:

17.220.99	Drugi standardi v zvezi z elektriko in magnetizmom	Other standards related to electricity and magnetism
31.020	Elektronske komponente na splošno	Electronic components in general

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en

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EUROPEAN STANDARD

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November 2016

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English Version

**Electrostatics - Part 5-1: Protection of electronic devices from
electrostatic phenomena - General requirements
(IEC 61340-5-1:2016)**

Electrostatique - Partie 5-1: Protection des dispositifs
électroniques contre les phénomènes électrostatiques -
Exigences générales
(IEC 61340-5-1:2016)

Elektrostatik - Teil 5-1: Schutz von elektronischen
Bauelementen gegen elektrostatische Phänomene -
Allgemeine Anforderungen
(IEC 61340-5-1:2016)

This European Standard was approved by CENELEC on 2016-07-01. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CENELEC member.

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European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

EN 61340-5-1:2016**European foreword**

The text of document 101/505/FDIS, future edition 2 of IEC 61340-5-1, prepared by IEC/TC 101 "Electrostatics" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 61340-5-1:2016.

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) 2017-05-18
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2019-11-18

This document supersedes EN 61340-5-1:2007.

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The text of the International Standard IEC 61340-5-1:2016 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standard indicated :

IEC 60749-26	NOTE	Harmonized as EN 60749-26.
IEC 60749-27	NOTE	Harmonized as EN 60749-27.
IEC 60364 (Series)	NOTE	Harmonized as EN 60364 (Series).
IEC 61010-1	NOTE	Harmonized as EN 61010-1.
IEC 61140	NOTE	Harmonized as EN 61140.
IEC/TR 61340-5-2	NOTE	Harmonized as CLC/TR 61340-5-2.

Annex ZA (normative)

Normative references to international publications with their corresponding European publications

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

NOTE 1 When an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cenelec.eu.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
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	EN 61340-2-3	-
IEC 61340-4-1	-	Electrostatics -- Part 4-1: Standard test methods for specific applications - Electrical resistance of floor coverings and installed floors	EN 61340-4-1	-
IEC 61340-4-3	-	Electrostatics -- Part 4-3: Standard test methods for specific applications - Footwear	EN 61340-4-3	-
IEC 61340-4-5	-	Electrostatics -- Part 4-5: Standard test methods for specific applications - Methods for characterizing the electrostatic protection of footwear and flooring in combination with a person	EN 61340-4-5	-
IEC 61340-4-6	-	Electrostatics -- Part 4-6: Standard test methods for specific applications - Wrist straps	EN 61340-4-6	-
IEC 61340-4-7	-	Electrostatics - Part 4-7: Standard test-methods for specific applications - Ionization		-
IEC 61340-4-9	-	Electrostatics - Part 4-9: Standard test methods for specific applications - Garments	EN 61340-4-9	-
IEC 61340-5-3	-	Electrostatics - Part 5-3: Protection of electronic devices from electrostatic phenomena - Properties and requirements classification for packaging intended for electrostatic discharge sensitive devices	EN 61340-5-3	-

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

ELECTROSTATICS –

Part 5-1: Protection of electronic devices from electrostatic phenomena – General requirements

FOREWORD

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International Standard IEC 61340-5-1 has been prepared by IEC technical committee 101: Electrostatics.

This second edition cancels and replaces the first edition published in 2007. This edition constitutes a technical revision.

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

- a) Technical requirements were changed to align IEC 61340-5-1 with other industry ESD standards;
- b) Reference documents were updated to reflect newly released IEC standards;
- c) A section on product qualification was added;
- d) Table 4 was deleted and detailed packaging requirements were deferred to IEC 61340-5-3;

e) Clause A.1 was removed and is now included in IEC 61340-4-6.

The text of this standard is based on the following documents:

FDIS	Report on voting
101/505/FDIS	101/508/RVD

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

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

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 publication will remain unchanged until the stability date indicated on the IEC website under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

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

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INTRODUCTION

This part of IEC 61340 covers the requirements necessary to design, establish, implement and maintain an electrostatic discharge (ESD) control program for activities that: manufacture, process, assemble, install, package, label, service, test, inspect, transport or otherwise handle electrical or electronic parts, assemblies and equipment susceptible to damage by electrostatic discharges greater than or equal to 100 V human body model (HBM), 200 V charged device model (CDM) and 35 V on isolated conductors. Isolated conductors were historically represented by machine model (MM). The 35 V limit is related to the level achievable using ionizers specified in this standard. The MM test is no longer required for qualification of devices, only the HBM and CDM tests are. The MM test is retained in this standard for process control of isolated conductors only.

Any contact and physical separation of materials or flow of solids, liquids, or particle-laden gases can generate electrostatic charges. Common sources of ESD include charged: personnel, conductors, common polymeric materials, and processing equipment. ESD damage can occur when:

- a charged person or object comes into contact with an ESD sensitive device (ESDS);
- an ESDS comes into direct contact with a highly conductive surface while exposed to an electrostatic field;
- a charged ESDS comes into contact with another conductive surface which is at a different electrical potential. This surface may or may not be grounded.

Examples of ESDS are microcircuits, discrete semiconductors, thick and thin film resistors, hybrid devices, printed circuit boards and piezoelectric crystals. It is possible to determine device and item susceptibility by exposing the device to simulated ESD events. The ESD withstand voltage determined by sensitivity tests using simulated ESD events does not necessarily represent the ability of the device to withstand ESD from real sources at that voltage level. However, the levels of sensitivity are used to establish a baseline of susceptibility data for comparison of devices with equivalent part numbers from different manufacturers. Three different models have been used for qualification of electronic components – human body model (HBM), machine model (MM), and charged device model (CDM). In current practice devices are qualified only using HBM and CDM susceptibility tests.

This standard covers the ESD control program requirements necessary for setting up a program to handle ESDS, based on the historical experience of both military and commercial organizations. The fundamental ESD control principles that form the basis of this standard are as follows.

- Avoid a discharge from any charged, conductive object (personnel and especially automated handling equipment) into the ESDS. This can be accomplished by bonding or electrically connecting all conductors in the environment, including personnel, to a known ground or contrived ground (as on board ship or on aircraft). This attachment creates an equipotential balance between all conducting objects and personnel. Electrostatic protection can be maintained at a potential different from a “zero” voltage ground potential as long as all conductive objects in the system are at the same potential.
- Avoid a discharge from any charged ESD sensitive device. Charging can result from direct contact and separation or it can be induced by an electric field. Necessary insulators in the environment cannot lose their electrostatic charge by attachment to ground. Ionization systems provide neutralization of charges on these necessary insulators (circuit board materials and some device packages are examples of necessary insulators). The ESD hazard created by electrostatic charges on the necessary insulators in the work place is assessed to ensure that appropriate actions are implemented, according to the risk.
- Once outside of an electrostatic discharge protected area (hereinafter referred to as an EPA) it is generally not possible to control the above items, therefore, ESD protective packaging may be required. ESD protection can be achieved by enclosing ESD sensitive products in static protective materials, although the type of material depends on the situation and destination. Inside an EPA, static dissipative materials may provide