SLOVENSKI STANDARD
oSIST prEN IEC 61340-4-6:2022

01-julij-2022

Elektrostatika - 4-6. del: Standardne preskusne metode za posebne aplikacije - Zapestni trakovi

Electrostatics - Part 4-6: Standard test methods for specific applications - Wrist straps

Elektrostatik - Teil 4-6: Standard-Prüfverfahren für spezielle Anwendungen - Handgelenkerdungsbänder

Électrostatique - Partie 4-6: Méthodes d'essai normalisées pour des applications spécifiques - Bracelets de conduction dissipative

Ta slovenski standard je istoveten z: **prEN IEC 61340-4-6:2022**

ICS:

17.220.99	Drugi standardi v zvezi z elektriko in magnetizmom	Other standards related to electricity and magnetism

oSIST prEN IEC 61340-4-6:2022 **en**

101/661/CDV

COMMITTEE DRAFT FOR VOTE (CDV)

PROJECT NUMBER: **IEC 61340-4-6 ED3**	
DATE OF CIRCULATION: **2022-05-20**	CLOSING DATE FOR VOTING: **2022-08-12**
SUPERSEDES DOCUMENTS: **101/634A/CC**	

IEC TC 101 : ELECTROSTATICS

SECRETARIAT: Germany	SECRETARY: Mr Hartmut Berndt
OF INTEREST TO THE FOLLOWING COMMITTEES:	PROPOSED HORIZONTAL STANDARD: ☐ Other TC/SCs are requested to indicate their interest, if any, in this CDV to the secretary.

FUNCTIONS CONCERNED:

☐ EMC ☐ ENVIRONMENT ☒ QUALITY ASSURANCE ☐ SAFETY

☒ SUBMITTED FOR CENELEC PARALLEL VOTING	☐ NOT SUBMITTED FOR CENELEC PARALLEL VOTING
Attention IEC-CENELEC parallel voting The attention of IEC National Committees, members of CENELEC, is drawn to the fact that this Committee Draft for Vote (CDV) is submitted for parallel voting. The CENELEC members are invited to vote through the CENELEC online voting system.	

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Recipients of this document are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

TITLE:

Electrostatics – Part 4-6: Standard test methods for specific applications – Wrist straps

PROPOSED STABILITY DATE: 2025

NOTE FROM TC/SC OFFICERS:

Change to add clause 2, normative references for equipment safety is the only technical change.

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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ELECTROSTATICS –

Part 4-6: Standard test methods for specific applications – Wrist straps

FOREWORD

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IEC 61340-4-6 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 2015. This edition constitutes a technical revision.

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

a) editorial comments made during the review of the second edition were reviewed and incorporated where appropriate;
b) addition of a normative section, clause 2 to address safety of equipment;

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

Draft	Report on comments
101/628/CD	101/634A/CC

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

A list of all parts in the IEC 61340 series, under the general title *Electrostatics*, can be found on the IEC website.

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.

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

INTRODUCTION

This part of IEC 61340 has been developed to establish test methods for evaluating the electrical and mechanical attributes of wrist straps used in an electrostatic control program. Wrist straps are intended to connect the user to electrical ground, thus preventing electrostatic charge on a user's body from attaining a level that may damage ESD susceptible devices or assemblies.

Test methods and performance limits for evaluation, acceptance, and functional testing are provided.

ELECTROSTATICS –

Part 4-6: Standard test methods for specific applications – Wrist straps

1 Scope

This part of IEC 61340 provides electrical and mechanical test methods and performance limits for evaluation, acceptance and periodic verification testing of wrist straps.

NOTE All dimensions are nominal except where indicated.

This standard is intended for testing wrist straps and wrist strap systems used for the grounding of personnel engaged in working with ESD sensitive assemblies and devices.

It does not address constant monitoring systems.

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 measurements, 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*

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
wrist strap
assembled device consisting of a band and ground cord that is designed to provide electrical connection from a person's skin to ground

3.2
wrist strap system
wrist strap when properly worn by a person, where the electrical path includes the person, the band and the ground cord

3.3
band
portion of the wrist strap worn on the wrist

Note 1 to entry: The band maintains electrical contact with a person's skin.

3.4
ground cord
portion of the wrist strap that provides flexibility of movement while completing the electrical circuit between the band and ground

3.5
evaluation testing
testing of a wrist strap to determine its electrical and mechanical performance abilities

Note 1 to entry: Data are in the form of values from laboratory testing.

3.6
acceptance testing
incoming tests to confirm proper marking and electrical functionality

Note 1 to entry: Data are in the form of visual inspection records and values or pass/fail notation.

3.7
periodic verification testing
end-use testing to confirm electrical functionality

Note 1 to entry: Data are in the form of pass/fail notation or resistance values.

3.8
current-limiting resistance
resistance value incorporated in series with the wrist strap's electrical path to ground

Note 1 to entry: This resistance limits electrical current that could pass through the ground cord in the event of inadvertent user contact with an electrical potential.

3.9
resistance range
user-specified upper and lower resistance values which define the user-acceptable resistance values of a wrist strap or wrist strap system

3.10
strain relief
construction feature designed to protect the connections and cord from premature failure

3.11
breakaway force
force required to disconnect the ground cord from the band

4 Testing levels and performance limits

This standard specifies different types of testing for wrist straps. Tables 1, 2 and 3 detail the three types of testing with the associated limits and subclause references to test methods. The methods provide appropriate tests for the different levels of wrist strap examination. Evaluation tests are laboratory tests for measuring the performance of a wrist strap or for the comparison of wrist straps. Acceptance tests provide methods for incoming goods inspection. Finally, the periodic verification or functional test is a simple check of electrical continuity. This test shall be used on a regular, user defined basis, to ensure that the wrist strap is electrically functional. Testing shall be carried out under ambient laboratory conditions. The temperature and humidity at the time of testing shall be recorded and reported in the test report. In the case of any dispute regarding test values, conditioning and testing shall be done at (23 ± 2) °C and (12 ± 3) % RH.

NOTE Testing has shown that environmental conditions do not significantly affect test results.

Table 1 – Evaluation testing

Electrical	Limit	Test reference
Wrist strap continuity and resistance	< 5 MΩ , or user defined value	5.2
Band resistance Interior: Exterior:	≤ 100 kΩ or user defined value > 10 MΩ	5.3
Mechanical	**Limit**	**Test reference**
Band size	As defined in 4.4	5.4
Breakaway force	> 4,4 N and < 22,6 N	5.5
Cord and connector integrity	> 22,6 N and > 66 % of cord strength	5.6
Ground cord extendibility	Extension to manufacturer's specified length with no loss of electrical continuity	5.7
Bending life	≥ 16 000 cycles	5.8
Marking	**Limit**	**Test reference**
Manufacturer's identification	Logo and/or name	5.9
Identification of non-standard resistance value	Prominent feature or value marked	5.10

Table 2 – Acceptance testing

Electrical	Limit	Test reference
Wrist strap resistance	< 5 MΩ, or user defined value	5.11
Marking	**Limit**	**Test reference**
Manufacturer's identification	Logo and/or name	5.9
Identification of non-standard Resistance value	Prominent feature or value marked	5.10

Table 3 – Periodic or verification testing

Electrical	Limit	Test reference
Wrist strap system continuity (as worn)	≤ 35 MΩ, or user defined value[a]	5.12
[a] A user defined lower limit of resistance might be required for safety or other considerations.		

Discrete current-limiting resistors should be located near the connection between the ground cord and the band.

5 Test methods

5.1 Test method applications

Refer to Tables 1, 2 and 3 for test method applications.

WARNING: Test procedures described in this standard can expose personnel to potentially hazardous electrical conditions. Appropriate electrical hazard reduction practices should be exercised and proper earth grounding instructions for the equipment used should be followed when performing tests. Safety requirements for electrical equipment for measurements are given in IEC 61010-1 and IEC 61010-2-030.