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

Táto norma obsahuje anglickú verziu európskej normy.
This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 03/17

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Electrostatics - Part 2-3: Methods of test for determining the resistance and resistivity of solid materials used to avoid electrostatic charge accumulation (IEC 61340-2-3:2016)

Électrostatique - Partie 2-3: Méthodes d'essais pour la détermination de la résistance et de la résistivité des matériaux solides destinés à éviter les charges électrostatiques
(IEC 61340-2-3:2016)

Elektrostatik - Teil 2-3: Prüfverfahren zur Bestimmung des Widerstandes und des spezifischen Widerstandes von festen Werkstoffen, die zur Vermeidung elektrostatischer Aufladung verwendet werden
(IEC 61340-2-3:2016)

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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 61340-2-3:2016

European foreword

The text of document 101/470/CDV, future edition 2 of IEC 61340-2-3, prepared by IEC/TC 101 "Electrostatics" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 61340-2-3:2016.

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)	2017-04-28
• latest date by which the national standards conflicting with the document have to be withdrawn	(dow)	2019-07-28

This document supersedes EN 61340-2-3:2000.

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Endorsement notice

The text of the International Standard IEC 61340-2-3:2016 was approved by CENELEC as a European Standard without any modification.

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

Publication	Year	Title	EN/HD	Year
IEC 62631-3-1	-	Dielectric and resistive properties of solid insulating materials - Part 3-1 Determination of resistive properties (DC Methods) - Volume resistance and volume resistivity, general method	EN 62631-3-1	-
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	EN 62631-3-2	-
IEC 62631-3-3	-	Dielectric and resistive properties of solid insulating materials - Part 3-3: Determination of resistive properties (DC methods) - Insulation resistance	EN 62631-3-3	-
ISO 1853	-	Conducting and dissipative rubbers, vulcanized or thermoplastic - Measurement of resistivity	-	-
ISO 2951	-	Rubber, vulcanized or thermoplastic - Determination of insulation resistance	-	-
ISO 3915	-	Plastics - Measurement of resistivity of conductive plastics	EN ISO 3915	-
ISO 7619-1	-	Rubber, vulcanized or thermoplastic - Determination of indentation hardness - Part-1: Durometer method (Shore hardness)	-	-

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INTERNATIONAL STANDARD

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

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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ELECTROSTATICS –

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

FOREWORD

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International Standard IEC 61340-2-3 has been prepared by IEC technical committee 101: Electrostatics.

This second edition cancels and replaces the first edition published in 2000. This edition constitutes a technical revision.

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

a) a distinction has been introduced between instrumentation used for laboratory evaluations, instrumentation used for acceptance testing and instrumentation used for compliance verification (periodic testing);

b) an alternative electrode assembly is described, which can be used on non-planar products or when the dimensions of the product under test are too small to allow the larger electrode assembly to be used;

c) the formulae for calculating surface and volume resistivity have been modified to correspond with common industry practice in the main areas of application for the IEC 61340 series.

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

CDV	Report on voting
101/470/CDV	101/494/RVC

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 the 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.

INTRODUCTION

Measurements of resistances and related calculations of resistivities belong to the fundamental objectives of electrical measuring techniques along with measurements of voltage and current.

Resistivity is the electrical characteristic having the widest range, extending over some thirty orders of magnitude from the most conductive metal to almost perfect insulators.

The basis is Ohm's law and is valid for DC current and instantaneous values of AC current in electron conductors (metals, carbon, etc.). Values of resistance measurements using AC current can be influenced by capacitive/inductive reactance, depending on the frequency. Thus, existing national and international standards dealing with resistance measurements of solid materials normally require the application of DC current.

Most non-metal materials such as plastics are classified as polymers and ion conductors. The transport of charges can be dependent upon the applied electrical field strength during the measurement. Beside the measuring current, there exists a charging current that polarizes and/or electrostatically charges the material, indicated by an asymptotic decay of the measuring current with time and causing an apparent change in resistance. If this effect is observed, it will be advisable to repeat the measurement immediately after a definite electrification time has elapsed using the reverse polarity for the measuring current and averaging both obtained values.

ELECTROSTATICS –

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

1 Scope

This part of IEC 61340 describes test methods for the determination of the electrical resistance and resistivity of solid materials used to avoid electrostatic charge accumulation, in which the measured resistance is in the range 10^4 Ω to 10^{12} Ω.

It takes account of existing IEC/ISO standards and other published information, and gives recommendations and guidelines on the appropriate method.

2 Normative references

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.

IEC 62631-3-1, *Dielectric and resistive properties of solid insulating materials – Part 3-1: Determination of resistive properties (DC Methods) – Volume resistance and volume resistivity – General method*

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*

IEC 62631-3-3, *Dielectric and resistive properties of solid insulating materials – Part 3-3: Determination of resistive properties (DC Methods) – Insulation resistance*

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

ISO 2951, *Rubber, vulcanized or thermoplastic – Determination of insulation resistance*

ISO 3915, *Plastics – Measurement of resistivity of conductive plastics*

ISO 7619-1, *Rubber, vulcanized or thermoplastic – Determination of indentation hardness – Part 1: Durometer method (Shore hardness)*