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Interested committees:

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Part 4-7: Standard test methods for specific applications - Ionization

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Introduction

This draft standard is based on European discussions in which the UK took an active part. Your comments on this draft are welcome and will assist in the preparation of the consequent British Standard. Comment is particularly welcome on national legislative or similar deviations that may be necessary.

Even if this draft standard is not approved by the UK, if it receives the necessary support in Europe, the UK will be obliged to publish the official English Language text unchanged as a British Standard and to withdraw any conflicting standard.

UK Vote

Please indicate whether you consider the UK should submit a negative (with reasons) or positive vote on this draft.

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Template for comments and secretariat observations

Date: xx/xx/20xx	Document: ISO/DIS xxxx
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1	2	(3)	4	5	(6)	(7)
MB	Clause No./ Subclause No./Annex (e.g. 3.1)	Paragraph/ Figure/ Table/Note	Type of comment	Comment (justification for change) by the MB	Proposed change by the MB	Secretariat observations on each comment submitted
	3.1	Definition 1	ed	Definition is ambiguous and needs clarifying.	Amend to read '...so that the mains connector to which no connection...'	
	6.4	Paragraph 2	te	The use of the UV photometer as an alternative cannot be supported as serious problems have been encountered in its use in the UK.	Delete reference to UV photometer.	



101/445/CDV

COMMITTEE DRAFT FOR VOTE (CDV) PROJET DE COMITÉ POUR VOTE (CDV)

Project number Numéro de projet		IEC 61340-4-7 Ed.2	
IEC/TC or SC: TC 101 CEI/CE ou SC:		Secretariat / Secrétariat Germany	
☒ Submitted for parallel voting in CENELEC ☐ Soumis au vote parallèle au CENELEC	Date of circulation Date de diffusion 2014-09-19	Closing date for voting (Voting mandatory for P-members) Date de clôture du vote (Vote obligatoire pour les membres (P)) 2014-12-19	
Also of interest to the following committees Intéresse également les comités suivants		Supersedes document Remplace le document 101/396/CD; 101/426A/CC	
Proposed horizontal standard Norme horizontale suggérée ☐ Other TC/SCs are requested to indicate their interest, if any, in this CDV to the TC/SC secretary Les autres CE/SC sont requis d'indiquer leur intérêt, si nécessaire, dans ce CDV à l'intention du secrétaire du CE/SC			
Functions concerned Fonctions concernées ☐ Safety Sécurité ☐ EMC CEM ☐ Environment Environnement ☒ Quality assurance Assurance qualité			

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Title :

IEC 61340-4-7 Ed.2: Electrostatics - Part 4-7: Standard test methods for specific applications – Ionization

Titre:

IEC 61340-4-7 Ed. 2: Electrostatique - Partie 4-7: Méthodes d'essai normalisées pour des applications spécifiques - Ionisation

ATTENTION VOTE PARALLÈLE CEI – CENELEC L'attention des Comités nationaux de la CEI, membres du CENELEC, est attirée sur le fait que ce projet de comité pour vote (CDV) de Norme internationale est soumis au vote parallèle. Les membres du CENELEC sont invités à voter via le système de vote en ligne du CENELEC	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) for an International Standard is submitted for parallel voting. The CENELEC members are invited to vote through the CENELEC online voting system.
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INTERNATIONAL ELECTROTECHNICAL COMMISSION

ELECTROSTATICS –

**Part 4-7: Standard test methods for specific applications –
Ionization**

FOREWORD

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International Standard IEC 61340-4-7 has been prepared by IEC technical committee 101: Electrostatics.

The text of this standard is based on ANSI/ESD STM3.1-2006. It was submitted to the National Committees for voting under the Fast Track Procedure.

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

FDIS	Report on voting
101/292/FDIS	101/299/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, under the general title *Electrostatics*, can be found on the IEC website.

102 The committee has decided that the contents of this publication will remain unchanged until
103 the maintenance result date indicated on the IEC web site under "http://webstore.iec.ch" in
104 the data related to the specific publication. At this date, the publication will be

- 105 • reconfirmed,
- 106 • withdrawn,
- 107 • replaced by a revised edition, or
- 108 • amended.

109 A bilingual version of this publication may be issued at a later date.

110

1

¹ The National Committees are requested to note that for this publication the stability date is 2019.

111

INTRODUCTION

112 Grounding is the primary method used to limit static charge when protecting electrostatic
113 discharge-susceptible items in the work environment. However, grounding methods are not
114 effective in removing static charges from the surfaces of non-conductive (insulative) or
115 isolated conductive materials. Air ionization techniques, by means of ionizer systems, can be
116 utilized to reduce this charge.

117 The preferred way of evaluating the ability of an ionizer to neutralize a static charge is to
118 directly measure the rate of charge decay. Charges to be neutralized may be located on
119 insulators as well as on isolated conductors. It is difficult to charge an insulator reliably and
120 repeatably. Charge neutralization is more easily evaluated by measuring the rate of decay of
121 the voltage of an isolated conductive plate. The measurement of this decay should not
122 interfere with or change the nature of the actual decay. Four practical methods of air
123 ionization are addressed in this standard test method:

- 124 a) radioactive emission;
- 125 b) high-voltage corona from a.c. electric fields;
- 126 c) high-voltage corona from d.c. electric fields;
- 127 d) soft X-ray emission.

128 This part of IEC 61340 provides test methods and procedures that can be used when
129 evaluating ionization equipment. The objective of the test methods is to generate meaningful,
130 reproducible data. The test methods are not meant to be a recommendation for any particular
131 ionizer configuration. The wide variety of ionizers, and the environments within which they are
132 used, will often require test methods different from those described in this standard. Users of
133 this standard should be prepared to adapt the test methods as required to produce meaningful
134 data in their own application of ionizers.

135 Similarly, the test conditions chosen in this standard do not represent a recommendation for
136 acceptable ionizer performance. There is a wide range of item sensitivities to static charge.
137 There is also a wide range of environmental conditions affecting the operation of ionizers.
138 Performance specifications should be agreed upon between the user and manufacturer of the
139 ionizer in each application. Users of this standard test method should be prepared to establish
140 reasonable performance requirements for their own application of ionizers.

141 Annex B provides a method for measuring capacitance of the charged plate.

142 The 2013 version of this document includes the use of contacting plate voltage measurements
143 in addition to the previous non-contacting plate voltage measurements. Charged Plate
144 Monitors (CPMs) using this technology have been in use in the industry for many years.

145

ELECTROSTATICS –

Part 4-7: Standard test methods for specific applications – Ionization

1 Scope

This standard provides test methods and procedures for evaluating and selecting air ionization equipment and systems (ionizers).

This standard establishes measurement techniques, under specified conditions, to determine offset voltage (ion balance) and discharge (charge neutralization) time for ionizers.

This standard does not include measurements of electromagnetic interference (EMI), or uses of ionizers in connection with ordnance, flammables, explosive items or electrically initiated explosive devices.

As contained in this standard, the test methods and test conditions may be used by manufacturers of ionizers to provide performance data describing their products. Users of ionizers are urged to modify the test methods and test conditions for their specific application in order to qualify ionizers for use, or to make periodic verifications of ionizer performance. The user will need to decide the extent of the data required for each application.

With respect to safety, the procedures and equipment described in this document may expose personnel to hazardous electrical and non-electrical conditions. Users of this document are responsible for selecting equipment that complies with applicable laws, regulatory codes and both external and internal policy. Users are cautioned that this document cannot replace or supersede any requirements for personnel safety.

2 Normative references

The following referenced documents are indispensable for the application 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/TR 61340-5-2, Protection of electronic devices from electrostatic phenomena – User guide

3 Terms and definitions

For the purposes of this document, the following terms and definitions, in addition to those specified in the ESD association glossary of terms, shall apply.

3.1

air conductivity

ability of air to conduct (pass) an electric current under the influence of an electric field

3.2

air ions

molecular clusters of about ten molecules (water, impurities, etc.) bound by polarization forces to a singly charged oxygen or nitrogen molecule

3.3

charge decay

decrease and/or neutralization of a net electrostatic charge

3.4

charge induction

redistribution of charge in an isolated conductor when placed in an electric field (e.g. from a charged body)

NOTE Momentary grounding of such a conductor would result in its gaining a net charge.

- 193 **3.5**
194 **charged plate monitor**
195 **CPM**
196 instrument used to measure the charge neutralization properties of ionization equipment
- 197 **3.6**
198 **compressed gas ionizer**
199 ionization devices that can be used to neutralize charged surfaces and/or remove surface
200 particles with pressurized gas
- 201 NOTE This type of ionizer may be used to ionize the gas within production equipment.
- 202 **3.7**
203 **corona**
204 production of positive or negative ions by a very localized high electric field
- 205 NOTE The field is normally established by applying a high voltage to a conductor in the shape of a sharp point or
206 wire.
- 207 **3.8**
208 **decay rate**
209 decrease of charge or voltage per unit time
- 210 **3.9**
211 **discharge time**
212 time necessary for a voltage (due to an electrostatic charge) to decay from an initial value to
213 some chosen final value
- 214 **3.10**
215 **emitter**
216 conducting sharp object, usually a needle or wire, which will cause a corona discharge when
217 kept at a high potential
- 218 **3.11**
219 **horizontal laminar flow**
220 non-turbulent airflow in a horizontal direction
- 221 **3.12**
222 **ion balance**
223 (see offset voltage)
- 224 **3.13**
225 **ionizer**
226 device that is designed to generate positive and/or negative air ions
- 227 **3.14**
228 **isolated conductor**
229 non-grounded conductor
- 230 **3.15**
231 **laminar flow hood ionization**
232 these devices or systems provide local area ionization coverage in vertical or horizontal
233 laminar flow hoods or benches