Si $C_R >> C_{CPM}$, C_{CPM}/C_R peut être omis dans l'Equation (A.4). Par conséquent, la capacité du moniteur à plaque chargée peut être calculée à partir de l'équation suivante:

$$C_{CPM} = (U_1/U_0) \times C_R \quad \text{(A.5)}$$

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Bibliographie

[1] IEC 61340-5-1, *Electrostatique – Partie 5-1: Protection des dispositifs électroniques contre les phénomènes électrostatiques – Exigences générales*

[2] ISO/IEC Guide 98-1, *Incertitude de mesure – Partie 1: Introduction à l'expression de l'incertitude de mesure*

[3] Guide IEC 108, *Lignes directrices pour assurer la cohérence des publications de l'IEC – Application des normes horizontales*

Références supplémentaires non citées

IEC TR 61340-1, *Electrostatique – Partie 1: Phénomènes électrostatiques – Principes et mesures*

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Electrostatics –
Part 2-1: Measurement methods – Ability of materials and products to dissipate static electric charge

Électrostatique –
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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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ELECTROSTATICS –

Part 2-1: Measurement methods – Ability of materials and products to dissipate static electric charge

FOREWORD

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This consolidated version of the official IEC Standard and its amendment has been prepared for user convenience.

IEC 61340-2-1 edition 2.1 contains the second edition (2015-08) [documents 101/446/CDV and 101/462/RVC] and its amendment 1 (2022-06) [documents 101/639/CDV and 101/651/RVC].

This Final version does not show where the technical content is modified by amendment 1. A separate Redline version with all changes highlighted is available in this publication.

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International Standard IEC 61340-2-1 has been prepared by IEC technical committee 101: Electrostatics.

This second edition constitutes a technical revision.

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

a) the first edition supported requirements in IEC TR 61340-5-1, but with the revision of IEC TR 61340-5-1 into an International Standard, this support is no longer required; references to IEC 61340-5-1[1][1] have been removed;
b) the introduction gives additional information on when charge decay time measurements are appropriate, and the applications for which each of the two test methods are best suited;
c) procedures for performance verification of measuring instruments for the corona charging method have been added.

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

It has the status of a horizontal standard in accordance with IEC Guide 108[3].

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 the base publication and its amendment will remain unchanged until the stability date indicated on the IEC web site under 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.

1 Numbers in square brackets refer to the Bibliography.

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INTRODUCTION

Measurements of the rate of dissipation of static charge belong to the essential measurement techniques in the field of electrostatics.

For homogeneous conductive materials, this property can be evaluated indirectly by measuring resistance or resistivity parameters. Care should be exercised when determining the homogeneity of materials, as some materials that appear homogenous do exhibit non−homogeneous electrical characteristics. If the homogeneity of materials is not known and cannot be otherwise verified, it is possible that resistance measurements will not be reliable or will not give enough information. It is also possible that resistance measurements will not be reliable when evaluating materials in the dissipative or insulative range and especially for high ohmic materials that include conductive fibres (e.g. textiles with a metallic grid). In such cases, the rate of dissipation of static charge should be measured directly.

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ELECTROSTATICS –

Part 2-1: Measurement methods – Ability of materials and products to dissipate static electric charge

1 Scope

This part of IEC 61340 describes test methods for measuring the rate of dissipation of static charge of insulating and static dissipative materials and products.

It includes a generic description of test methods and detailed test procedures for specific applications.

The two test methods for measuring charge decay time, one using corona charging and one using a charged metal plate are different and it is possible that they will not give equivalent results. Nevertheless, each method has a range of applications for which it is best suited. The corona charging method is suitable for evaluating the ability of materials, for example textiles, packaging, to dissipate charge from their own surfaces. The charged metal plate method is suitable for evaluating the ability of materials and objects such as gloves, finger cots, hand tools, to dissipate charge from conductive objects placed on or in contact with them. It is possible that the charged plate method will not be suitable for evaluating the ability of materials to dissipate charge from their own surfaces.

In addition to its general application, this horizontal standard is also intended for use by technical committees in the preparation of standards in accordance with the principles laid down in IEC Guide 108.

One of the responsibilities of a technical committee is, wherever applicable, to make use of horizontal standards in the preparation of its publications. The contents of this horizontal standard shall not apply unless specifically referred to or included in the relevant publications.

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 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 61340-4-6, *Electrostatics – Part 4-6: Standard test methods for specific applications – Wrist straps*

IEC 61340-4-7, *Electrostatics – Part 4-7: Standard test methods for specific applications – Ionization*

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3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
charge decay
migration of charge across or through a material leading to a reduction of charge density or surface potential at the area where the charge was deposited

3.2
charge decay time
time from an initial voltage to a set fraction of the initial voltage

Note 1 to entry: 1/e and 10 % are appropriate fractions (e is the base of natural logarithms, equal to 2,718). If the initial voltage is low, the accuracy of decay time measurements to a small fraction of the initial voltage can be susceptible to the noise level of the fieldmeter.

3.3
charged plate monitor
CPM
instrument using a charged metal plate of a defined capacitance and geometry which is discharged in order to measure charge dissipation/neutralization properties of products or materials

Note 1 to entry: This note only applies to the French language.

3.4
corona
corona discharge
generation of ions of either polarities by a high electric field

3.5
static dissipative material
material which allows charge to migrate over its surface and/or through its volume in a time which is short compared to the time scale of the actions creating the charge, or short compared to the time within which this charge will cause an electrostatic problem

Note 1 to entry: Materials that are considered conductive in other contexts are included within this definition for the purposes of this part of IEC 61340.

3.6
initial voltage
< corona charge decay> surface potential at a time after the end of charge deposition that is a sensible match to the time it takes material surfaces to separate in practical situations

Note 1 to entry: A time of 100 ms is appropriate for manual tribocharging actions.

3.7
initial voltage
<contact charge decay> voltage applied to the conductive plate of a charged plate monitor

3.8
insulator
material with very low mobility of charge so that any charge on the surface will remain there for a time which is long compared to the time scale of the actions creating the charge

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