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Dielectric and resistive properties of solid insulating materials - Part 2-1: Relative permittivity and dissipation factor - Technical frequencies (0,1 Hz to 10 MHz) - AC Methods

EESTI STANDARDI EESSÕNA

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See Eesti standard EVS-EN IEC 62631-2-1:2018 sisaldab Euroopa standardi EN IEC 62631-2-1:2018 ingliskeelset teksti.	This Estonian standard EVS-EN IEC 62631-2-1:2018 consists of the English text of the European standard EN IEC 62631-2-1:2018.
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EUROPEAN STANDARD

EN IEC 62631-2-1

NORME EUROPÉENNE

EUROPÄISCHE NORM

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English Version

**Dielectric and resistive properties of solid insulating materials -
Part 2-1: Relative permittivity and dissipation factor - Technical
frequencies (0,1 Hz to 10 MHz) - AC Methods
(IEC 62631-2-1:2018)**

Propriétés diélectriques et résistives des matériaux isolants
solides - Partie 2-1: Permittivité relative et facteur de
dissipation - Fréquences techniques (0,1 Hz à 10 MHz) -
Méthodes en courant alternatif
(IEC 62631-2-1:2018)

Dielektrische und resistive Eigenschaften fester
Elektroisolerstoffe Teil 2-1: Dielektrizitätszahl und der
Verlustfaktor Technische Frequenzen (0,1 Hz - 10 MHz) -
Wechselspannungsverfahren
(IEC 62631-2-1:2018)

This European Standard was approved by CENELEC on 2018-04-03. 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.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

European foreword

The text of document 112/412/FDIS, future edition 1 of IEC 62631-2-1, prepared by IEC/TC 112 "Evaluation and qualification of electrical insulating materials and systems" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 62631-2-1:2018.

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) 2019-01-03
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2021-04-03

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Endorsement notice

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

IEC 60216-1	NOTE	Harmonized as EN 60216-1.
IEC 60216-4-1:2006	NOTE	Harmonized as EN 60216-4-1:2006 (not modified).
IEC 60247	NOTE	Harmonized as EN 60247.
IEC 60505	NOTE	Harmonized as EN 60505.
IEC 62631-1	NOTE	Harmonized as EN 62631-1.
IEC 60455 series	NOTE	Harmonized as EN 60455 series.
IEC 60464 series	NOTE	Harmonized as EN 60464 series.
IEC 61212 series	NOTE	Harmonized as EN 61212 series.
ISO 291	NOTE	Harmonized as EN ISO 291.
ISO 294-1	NOTE	Harmonized as EN ISO 294-1.
ISO 294-3	NOTE	Harmonized as EN ISO 294-3.
ISO 295	NOTE	Harmonized as EN ISO 295.

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INTRODUCTION

Tan δ , also called loss tangent, or dissipation factor is a basic parameter for the quality of insulating materials. The measurement of capacitance and loss angle is a classical method well established in the industry over 100 years.

The dissipation factor (tan δ) is dependent on several parameters, such as electrode design, material characteristics, environmental issues, moisture, temperature, voltage applied, and highly dependent on frequencies, the accuracy of measuring apparatus and other parameters applied to the measured specimen.

The frequency range is limited, depending on the test cell and electrode design, the dimension of the samples and connection leads. In this standard the parameters for the frequencies applied are therefore limited in the range of very low frequency (VLF) from less than 1 Hz and up to 10 MHz. However, measuring instruments can provide a broader frequency range, whereby the usable and suitable frequency range is limited by the whole test setup.

DIELECTRIC AND RESISTIVE PROPERTIES OF SOLID INSULATING MATERIALS –

Part 2-1: Relative permittivity and dissipation factor – Technical frequencies (0,1 Hz to 10 MHz) – AC methods

1 Scope

This part of IEC 62631 describes test methods for the determination of permittivity and dissipation factor properties of solid insulating materials (AC methods from 0,1 Hz up to 10 MHz).

NOTE This part of the standard mainly considers measuring setups with guard-electrodes.

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 60212, *Standard conditions for use prior to and during the testing of solid electrical insulating materials*

ISO 4593, *Plastics – Film and sheeting – Determination of thickness by mechanical scanning*

3 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

3.1

electrical insulating material

solid with negligibly low electric conductivity, used to separate conducting parts at different electrical potentials

Note 1 to entry: The term "electrical insulating material" is sometimes used in a broader sense to designate also insulating liquids and gases. Insulating liquids are covered by IEC 60247.

3.2

dielectric properties

comprehensive behaviour of an insulating material measured with AC comprising the capacitance, absolute permittivity, relative permittivity, relative complex permittivity, dielectric dissipation factor

3.3

absolute permittivity

electric flux density divided by the electric field strength