

SLOVENSKI STANDARD

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Preskušanje požarne ogroženosti - 7-2. del: Toksičnost dimnih plinov - Povzetek in relevantnost preskusnih metod (IEC 60695-7-2:2021)

Fire hazard testing - Part 7-2: Toxicity of fire effluent - Summary and relevance of test methods (IEC 60695-7-2:2021)

Prüfungen zur Beurteilung der Brandgefahr - Teil 7-2: Toxizität von Rauch und/oder Brandgasen - Auswertung und Sachdienlichkeit von Prüfverfahren (IEC 60695-7-2:2021)

Essais relatifs aux risques du feu - Partie 7-2: Toxicité des effluents du feu - Résumé et pertinence des méthodes d'essai (IEC 60695-7-2:2021)

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Ta slovenski standard je istoveten z: EN IEC 60695-7-2:2021
2022

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29.020	Elektrotehnika na splošno	Electrical engineering in general

SIST EN IEC 60695-7-2:2022

en

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN IEC 60695-7-2

December 2021

ICS 13.220.40; 29.020

Supersedes EN 60695-7-2:2011 and all of its
amendments and corrigenda (if any)

English Version

**Fire hazard testing - Part 7-2: Toxicity of fire effluent - Summary
and relevance of test methods
(IEC 60695-7-2:2021)**

Essais relatifs aux risques du feu - Partie 7-2: Toxicité des
effluents du feu - Résumé et pertinence des méthodes
d'essai
(IEC 60695-7-2:2021)

Prüfungen zur Beurteilung der Brandgefahr - Teil 7-2:
Toxizität von Rauch und/oder Brandgasen - Auswertung
und Sachdienlichkeit von Prüfverfahren
(IEC 60695-7-2:2021)

This European Standard was approved by CENELEC on 2021-12-02. 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

EN IEC 60695-7-2:2021 (E)**European foreword**

The text of document 89/1489/CDV, future edition 2 of IEC 60695-7-2, prepared by IEC/TC 89 "Fire hazard testing" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 60695-7-2:2021.

The following dates are fixed:

- latest date by which the document has to be implemented at national (dop) 2022-09-02 level by publication of an identical national standard or by endorsement
- latest date by which the national standards conflicting with the (dow) 2024-12-02 document have to be withdrawn

This document supersedes EN 60695-7-2:2011 and all of its amendments and corrigenda (if any).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC shall not be held responsible for identifying any or all such patent rights.

Any feedback and questions on this document should be directed to the users' national committee. A complete listing of these bodies can be found on the CENELEC website.

iTeh STANDARD
Endorsement notice
PREVIEW

The text of the International Standard IEC 60695-7-2:2021 was approved by CENELEC as a European Standard without any modification.

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

~~SIST EN IEC 60695-7-2:2022~~
<https://standards.iteh.ai/catalog/standards/sist/6d064382-2aeb-43fb-b9dd-db030ec20bad/sist-en-iec-60695-7-2-2021>

IEC 60695-1-11 NOTE Harmonized as EN 60695-1-11

IEC 60695-1-12 NOTE Harmonized as EN IEC 60695-1-12

IEC 60695-4 NOTE Harmonized as EN IEC 60695-4

ISO 5659-2 NOTE Harmonized as EN ISO 5659-2

IEC 60695-6-2 NOTE Harmonized as EN IEC 60695-6-2

Annex ZA

(normative)

Normative references to international publications with their corresponding European publications

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.

NOTE 1 Where 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.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60695-1-10	-	Fire hazard testing - Part 1–10: Guidance for assessing the fire hazard of electrotechnical products - General guidelines	EN 60695-1-10	-
IEC 60695-7-1	-	Fire hazard testing - Part 7–1: Toxicity of fire effluent - General guidance	EN 60695-7-1	-
IEC 60695-7-3	-	Fire hazard testing - Part 7–3: Toxicity of fire effluent - Use and interpretation of test results	EN 60695-7-3	-
IEC Guide 104	-	The preparation of safety publications and the use of basic safety publications and group safety publications	-	-
ISO/IEC Guide 51	-	Safety aspects - Guidelines for their inclusion in standards	-	-
ISO 13943	2017	Fire safety - Vocabulary	EN ISO 13943	2017
ISO 13344	-	Estimation of the lethal toxic potency of fire - effluents	-	-
ISO 13571	2007	Life-threatening components of fire - Guidelines for the estimation of time available for escape using fire data	-	-
ISO/TR 16312-2	-	Guidance for assessing the validity of physical fire models for obtaining fire effluent toxicity data for fire hazard and risk assessment - Part 2: Evaluation of individual physical fire models	-	-
ISO 19706	-	Guidelines for assessing the fire threat to people	-	-
ISO 29903	2012	Guidance for comparison of toxic gas data - between different physical fire models and scales	-	-

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IEC 60695-7-2

Edition 2.0 2021-10

INTERNATIONAL STANDARD

NORME INTERNATIONALE

HORIZONTAL PUBLICATION
PUBLICATION HORIZONTALE

iTeh STANDARD

Fire hazard testing –
Part 7-2: Toxicity of fire effluent – Summary and relevance of test methods

PREVIEW
(standards.iteh.ai)

Essais relatifs aux risques du feu –
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<https://standards.iteh.ai/catalog/standards/sist/6d064382-2aeb-43fb-b9dd-db030ec20bad/sist-en-iec-60695-7-2-2022>

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

FIRE HAZARD TESTING –

**Part 7-2: Toxicity of fire effluent –
Summary and relevance of test methods**

FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as “IEC Publication(s)”). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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International Standard IEC 60695-7-2 has been prepared by IEC technical committee 89: Fire hazard testing.

This second edition cancels and replaces the first edition published in 2011. This edition constitutes a technical revision.

The main changes with respect to the previous edition are listed below:

- New text in the introduction;
- New text in the scope;
- Clause 2 has been updated;
- Many terms and definitions in Clause 3 reproduced from ISO 13943 have been deleted. Other terms and definitions have been added.
- New text in Subclauses 4.3 and 4.4;
- New text in Subclause 6.1;

- References to IEC 60695-7-50 and -51 (now withdrawn) have been removed;
- Reference to DEF STAN 07-247 has been added;
- Details of ISO/TS 19021 have been added;
- Details of EN 17084 have been added;
- New text added concerning ISO/TS 19700;
- New text added concerning the IMO FTP toxicity test;
- New Subclause 7.1 has been added;
- The Annex in Edition 1 has been replaced by new Clause 8;
- The bibliography has been updated.

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

Draft	Report on voting
89/1489/CDV	89/1508/RVC

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.

It has the status of a basic safety publication in accordance with IEC Guide 104.

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/standardsdev/publications.

A list of all the parts in the 60695 series, under the general title *Fire hazard testing*, can be found on the IEC website.

IEC 60695-7 consists of the following parts:

- Part 7-1: *Toxicity of fire effluent – General guidance*
- Part 7-2: *Toxicity of fire effluent – Summary and relevance of test methods*
- Part 7-3: *Toxicity of fire effluent – Use and interpretation of test results*

In this document the following print types are used:

- Words *in italics* in the text are defined in Clause 3.

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

In the design of an electrotechnical product, the risk of fire and the potential hazards associated with fire need to be considered. In this respect the objective of component, circuit and equipment design, as well as the choice of materials, is to reduce the risk of fire to a tolerable level even in the event of reasonably foreseeable (mis)use, malfunction or failure.

IEC 60695-1-10, IEC 60695-1-11 [1]¹, and IEC 60695-1-12 [2] provide guidance on how this is to be accomplished.

Fires involving electrotechnical products can also be initiated from external non-electrical sources. Considerations of this nature are dealt with in an overall fire hazard assessment.

The aim of the IEC 60695 series of standards is to save lives and property by reducing the number of fires or reducing the consequences of the fire. This can be accomplished by:

- trying to prevent ignition caused by an electrically energised component part and, in the event of ignition, to confine any resulting fire within the bounds of the enclosure of the electrotechnical product;
- trying to minimise flame spread beyond the product's enclosure and to minimise the harmful effects of fire effluents including heat, smoke, and toxic or corrosive combustion products.

Electrotechnical products, primarily as the objects of a fire, may contribute to the fire hazard due to the release of toxic effluent, which may be a significant contributing factor to the overall fire hazard.

The IEC 60695-7 series provides guidance to IEC product committees on the adoption and implementation of the recommendations of ISO for the minimization of toxic hazard from fires involving electrotechnical products. This part of IEC 60695-7 describes fire effluent toxicity test methods in common use to assess electrotechnical products or materials used in electrotechnical products.

IEC product committees incorporating requirements for the assessment of toxic hazard from fire in product standards should note that *toxic potency* and other measurements of toxicity which are described in this part of IEC 60695 should not be used directly in product specifications. Data from *toxic potency* test methods should only be used as part of a toxic hazard assessment, in conjunction with other product-based reaction to fire data such as mass loss rate.

¹ Numbers in square brackets refer to the bibliography.

FIRE HAZARD TESTING –

Part 7-2: Toxicity of fire effluent – Summary and relevance of test methods

1 Scope

This part of IEC 60695-7 gives a brief summary of the test methods that are in common use in the assessment of the toxicity of fire effluent. It includes special observations on their relevance to real fire scenarios and gives recommendations on their use.

It advises which tests provide *toxic potency* data that are relevant to real fire scenarios, and which are suitable for use in fire hazard assessment and fire safety engineering.

The list of test methods is not to be considered exhaustive.

This summary cannot be used in place of published standards which are the only valid reference documents.

This basic safety publication is intended for use by technical committees in the preparation of standards in accordance with the principles laid down in IEC Guide 104 and ISO/IEC Guide 51.

One of the responsibilities of a technical committee is, wherever applicable, to make use of basic safety publications in the preparation of its publications. The requirements, test methods or test conditions of this basic safety publication will not apply unless specifically referred to or included in the relevant publications.

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 60695-1-10, *Fire hazard testing - Part 1-10: Guidance for assessing the fire hazard of electrotechnical products - General guidelines*

IEC 60695-7-1, *Fire hazard testing - Part 7-1: Toxicity of fire effluent - General guidance*

IEC 60695-7-3, *Fire hazard testing - Part 7-3: Toxicity of fire effluent - Use and interpretation of test results*

IEC GUIDE 104, *The preparation of safety publications and the use of basic safety publications and group safety publications*

ISO/IEC Guide 51, *Safety aspects – Guidelines for their inclusion in standards*

ISO 13943:2017, *Fire safety – Vocabulary*

ISO 13344, *Estimation of the lethal toxic potency of fire effluents*

ISO 13571:2007, *Life-threatening components of fire – Guidelines for the estimation of time available for escape using fire data*

ISO/TR 16312-2, *Guidance for assessing the validity of physical fire models for obtaining fire effluent toxicity data for fire hazard and risk assessment – Part 2: Evaluation of individual physical fire models*

ISO 19706, *Guidelines for assessing the fire threat to people*

ISO 29903:2012, *Guidance for comparison of toxic gas data between different physical fire models and scales*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 13943:2017, some of which are reproduced below for the user's convenience, and the following 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

acute toxicity

toxicity that causes rapidly occurring toxic effects

Note 1 to entry: Compare with the term *toxic potency* (3.16).

[ISO 13943:2017, definition 3.8] [SIST EN IEC 60695-7-2:2022
https://standards.iteh.ai/catalog/standards/sist/6d064382-2aeb-43fb-b9dd-db030ec20bad/sist-en-iec-60695-7-2-2022](https://standards.iteh.ai/catalog/standards/sist/6d064382-2aeb-43fb-b9dd-db030ec20bad/sist-en-iec-60695-7-2-2022)

3.2

asphyxiant

toxicant (3.17) that causes hypoxia, which can result in central nervous system depression or cardiovascular effects

Note 1 to entry: Loss of consciousness and ultimately death may occur.

[ISO 13943:2017, definition 3.23]

3.3

concentration

mass of a dispersed or dissolved material in a given volume

Note 1 to entry: For a fire effluent the typical unit is $\text{g} \cdot \text{m}^{-3}$.

Note 2 to entry: For toxic gas, concentration is usually expressed as a *volume fraction* (3.18) at $T = 298 \text{ K}$ and $P = 1 \text{ atm}$, with typical units of $\mu\text{L/L}$ ($= \text{cm}^3/\text{m}^3 = 10^{-6}$).

Note 3 to entry: The concentration of a gas at a temperature, T , and a pressure, P , can be calculated from its volume fraction (assuming ideal gas behaviour) by multiplying the volume fraction by the density of the gas at that temperature and pressure.

Note 4 to entry: Pascal (Pa) is the SI unit for pressure; however, atmosphere (atm) is typically used in this context, where $1 \text{ atm} = 101,3 \text{ kPa}$.

[ISO 13943:2017, definition 3.62]