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Standards

Irish Standard  
I.S. EN IEC 60695-6-1:2021

# Fire hazard testing - Part 6-1: Smoke obscuration - General guidance

**I.S. EN IEC 60695-6-1:2021**

*Incorporating amendments/corrigenda/National Annexes issued since publication:*

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## National Foreword

I.S. EN IEC 60695-6-1:2021 is the adopted Irish version of the European Document EN IEC 60695-6-1:2021, Fire hazard testing - Part 6-1: Smoke obscuration - General guidance

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**EN IEC 60695-6-1**

September 2021

ICS 13.220.99; 29.020

Supersedes EN 60695-6-1:2005 and all of its  
amendments and corrigenda (if any)

English Version

**Fire hazard testing - Part 6-1: Smoke obscuration - General  
guidance  
(IEC 60695-6-1:2021)**

Essais relatifs aux risques du feu - Partie 6-1:  
Obscurcissement dû à la fumée - Recommandations  
générales  
(IEC 60695-6-1:2021)

Prüfungen zur Beurteilung der Brandgefahr - Teil 6-1:  
Sichtminderung durch Rauch - Allgemeiner Leitfaden  
(IEC 60695-6-1:2021)

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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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Comité Européen de Normalisation Electrotechnique  
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**CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels**

## **EN IEC 60695-6-1:2021 (E)**

### **European foreword**

The text of document 89/1472/CDV, future edition 3 of IEC 60695-6-1, prepared by IEC/TC 89 “Fire hazard testing” was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 60695-6-1:2021.

The following dates are fixed:

- latest date by which the document has to be implemented at national (dop) 2022-06-09 level by publication of an identical national standard or by endorsement
- latest date by which the national standards conflicting with the (dow) 2024-09-09 document have to be withdrawn

This document supersedes EN 60695-6-1:2005 and all of its amendments and corrigenda (if any).

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### **Endorsement notice**

The text of the International Standard IEC 60695-6-1:2021 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:

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

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

IEC 61034-1 NOTE Harmonized as EN 61034-1

IEC 61034-2 NOTE Harmonized as EN 61034-2

## 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](http://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 60695-1-11	-	Fire hazard testing - Part 1–11: Guidance for assessing the fire hazard of electrotechnical products - Fire hazard assessment	EN 60695-1-11	-
IEC 60695-4	-	Fire hazard testing - Part 4: Terminology concerning fire tests for electrotechnical products	EN IEC 60695-4	-
IEC 60695-6-2	-	Fire hazard testing - Part 6–2: Smoke obscuration - Summary and relevance of test methods	EN IEC 60695-6-2	-
IEC Guide 104	-	The preparation of safety publications and the use of basic safety publications and group safety publications		-
ISO 13943	2017	Fire safety - Vocabulary	EN ISO 13943	2017
ISO/IEC Guide 51	-	Safety aspects - Guidelines for their inclusion in standards		-

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**IEC 60695-6-1**

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# INTERNATIONAL STANDARD

## NORME INTERNATIONALE

HORIZONTAL PUBLICATION  
PUBLICATION HORIZONTALE

**Fire hazard testing –  
Part 6-1: Smoke obscuration – General guidance**

**Essais relatifs aux risques du feu –  
Partie 6-1: Obscurcissement dû à la fumée – Recommandations générales**



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**IEC 60695-6-1**

Edition 3.0 2021-08

# INTERNATIONAL STANDARD

## NORME INTERNATIONALE

HORIZONTAL PUBLICATION  
PUBLICATION HORIZONTALE

**Fire hazard testing –  
Part 6-1: Smoke obscuration – General guidance**

**Essais relatifs aux risques du feu –  
Partie 6-1: Obscurcissement dû à la fumée – Recommandations générales**

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

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### **FIRE HAZARD TESTING –**

#### **Part 6-1: Smoke obscuration – General guidance**

#### **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 60695-6-1 has been prepared by IEC technical committee 89: Fire hazard testing.

This third edition cancels and replaces the second edition of IEC 60695-6-1 published in 2005 and Amendment 1:2010. It constitutes a technical revision.

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

- References to IEC TS 60695-6-30 (withdrawn in 2016) have been removed.
- References to IEC TS 60695-6-31 (withdrawn in 2016) have been removed.
- References to ISO 5659-2 have been inserted.
- The scope contains some additional text.
- Terms and definitions have been updated.

- Subclause 3.2 has been updated.
- Subclause 7.1 has been updated.

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

Draft	Report on voting
89/1472/CDV	89/1504/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 and ISO/IEC Guide 51.

This International Standard is to be used in conjunction with IEC 60695-6-2.

In this standard, the following print types are used:

- *italic font: terms defined in Clause 3.*

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

IEC 60695-6 consists of the following parts:

Part 6-1: Smoke obscuration – General guidance

Part 6-2: Smoke obscuration – Summary and relevance of test methods

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](http://www.iec.ch/members_experts/refdocs). The main document types developed by IEC are described in greater detail at [www.iec.ch/standardsdev/publications](http://www.iec.ch/standardsdev/publications).

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](http://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, and IEC 60695-1-12 [1]<sup>1</sup> 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 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.

One of the contributing hazards is the release of *smoke*, which may cause loss of vision and/or disorientation which could impede escape from the building or fire fighting.

*Smoke* particles reduce the *visibility* due to light absorption and scattering. Consequently, people may experience difficulties in finding exit signs, doors and windows. *Visibility* is often determined as the distance at which an object is no longer visible. It depends on many factors, but close relationships have been established between *visibility* and the measurements of the *extinction coefficient of smoke* – see Annex A.

The production of *smoke* and its optical properties can be measured as well as other fire properties, such as heat release, flame spread, and the production of toxic gas and corrosive effluent. This document serves as a guidance document and focuses on obscuration of light by *smoke*.

---

<sup>1</sup> Numbers in square brackets refer to the bibliography.



## **FIRE HAZARD TESTING –**

### **Part 6-1: Smoke obscuration – General guidance**

#### **1 Scope**

This part of IEC 60695 gives guidance on:

- a) the optical measurement of *obscuration of smoke*;
- b) general aspects of optical *smoke* test methods;
- c) consideration of test methods;
- d) expression of *smoke* test data;
- e) the relevance of optical *smoke* data to hazard assessment.

This basic safety publication focusing on safety guidance is primarily intended for use by technical committees in the preparation of safety publications 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.

#### **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 60695-1-11, *Fire hazard testing – Part 1-11: Guidance for assessing the fire hazard of electrotechnical products – Fire hazard assessment*

IEC 60695-4, *Fire hazard testing – Part 4: Terminology concerning fire tests for electrotechnical products*

IEC 60695-6-2, *Fire hazard testing – Part 6-2: Smoke obscuration – Summary and relevance of test methods*

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*

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