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**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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CONTENTS

FOREWORD.....	4
INTRODUCTION.....	6
1 Scope.....	7
2 Normative references.....	7
3 Terms, definitions and symbols.....	8
3.1 Terms and definitions.....	8
3.2 Symbols.....	10
4 General aspects of smoke test methods.....	11
4.1 Fire scenarios and physical fire models.....	11
4.2 Factors affecting smoke production.....	12
4.2.1 General.....	12
4.2.2 Modes of decomposition.....	12
4.2.3 Ventilation and the burning environment.....	16
4.2.4 Time and temperature.....	16
4.2.5 Removal mechanisms for smoke particles.....	16
5 Principles of smoke measurement.....	16
5.1 General.....	16
5.2 Bouguer's law.....	16
5.3 Extinction area.....	17
5.4 Log ₁₀ units.....	18
5.5 Light sources.....	18
5.6 <i>Specific extinction area of smoke</i>	18
5.7 <i>Mass optical density of smoke</i>	19
5.8 <i>Visibility</i>	20
6 Static and dynamic methods.....	20
6.1 Static methods.....	20
6.1.1 Principles.....	20
6.1.2 <i>Extinction area of smoke</i>	20
6.1.3 <i>Specific optical density of smoke</i>	21
6.1.4 Prediction of <i>visibility</i>	21
6.2 Dynamic methods.....	21
6.2.1 Principles.....	21
6.2.2 Smoke production rate.....	21
6.2.3 Total smoke production.....	22
6.2.4 SMOGRA index.....	22
7 Test methods.....	23
7.1 Consideration of test methods.....	23
7.2 Selection of test specimen.....	24
8 Presentation of data.....	24
9 Relevance of data to hazard assessment.....	24
Annex A (informative) Calculation of <i>visibility</i>	27
A.1 General.....	27
A.2 Example.....	27
Annex B (informative) Relationships between D_s and some other smoke parameters as measured in ISO 5659-2 [4].....	29

Annex C (informative) Relationships between per cent transmission, as measured in a "three metre cube" enclosure, and extinction area	31
Bibliography	33
Figure 1 – Different phases in the development of a fire within a compartment	12
Figure 2 – Attenuation of light by smoke	17
Figure 3 – Extinction area	18
Figure 4 – Dynamic smoke measurement	21
Figure 5 – Example SPR_{av} versus t curve	23
Figure 6 – SMOGRA curve derived from Figure 5	23
Figure 7 – Evaluation and consideration of smoke test methods.....	26
Figure A.1 – <i>Visibility</i> (ω) versus <i>extinction coefficient</i> (k).....	27
Figure B.1 – Smoke parameters related to D_s as measured in ISO 5659-2	30
Figure C.1 – Extinction area (amount of smoke) related to per cent transmission as measured in the "three metre cube".....	32
Table 1 – Characteristics of fire stages (from Table 1 in ISO 19706:2011).....	14
Table B.1 – Conversion from D_s to some other smoke parameters as measured in ISO 5659-2.....	29
Table C.1 – Conversions from per cent transmission, as measured in the "three metre cube" to amount of smoke (extinction area)	31

INTERNATIONAL ELECTROTECHNICAL COMMISSION

FIRE HAZARD TESTING –

Part 6-1: Smoke obscuration – General guidance

FOREWORD

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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. The main document types developed by IEC are described in greater detail at 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 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]¹ 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*.

¹ 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*