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Fire hazard testing -
Part 1-14: Guidance on the different levels of power and energy related to the probability of ignition and fire in low voltage electrotechnical products

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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Fire hazard testing - Part 1-14: Guidance on the different levels of power and energy related to the probability of ignition and fire in low voltage electrotechnical products

FOREWORD

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IEC 60695-1-14 has been prepared by IEC technical committee 89: Fire hazard testing. It is an International Standard.

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

This first edition cancels and replaces the first edition of IEC TS 60695-1-14 published in 2017. This edition constitutes a technical revision. This edition includes the following significant technical changes with respect to the previous edition:

a) Conversion from a Technical Specification to an International Standard;
b) Improved clarification on when the classification of Figure 1 (power/time limits) and Figure 2 (time limits) can be used;
c) Updated normative references.

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

Draft	Report on voting
89/1619/CDV	89/1651/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.

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/publications.

This publication is to be used in conjunction with IEC 60695-1-10 and IEC 60695-1-11.

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

Part 1 consists of the following parts:

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

Part 1-11: *Guidance for assessing the fire hazard of electrotechnical products - Fire hazard assessment*

Part 1-12: *Guidance for assessing the fire hazard of electrotechnical products - Fire safety engineering*

Part 1-14: *Guidance on the different levels of power and energy related to the probability of ignition and fire in low voltage electrotechnical products* (this document)

Part 1-20: *Guidance for assessing the fire hazard of electrotechnical products - Ignitability - General guidance*

Part 1-21: *Guidance for assessing the fire hazard of electrotechnical products - Ignitability - Summary and relevance of test methods*

Part 1-30: *Guidance for assessing the fire hazard of electrotechnical products - Preselection testing process - General guidelines*

Part 1-40: *Guidance for assessing the fire hazard of electrotechnical products - Insulating liquids*

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, or
– revised.

INTRODUCTION

In the design of any 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 [1], IEC 60695-1-11 [2] and IEC 60695-1-12 [3] provide guidance on how this is to be accomplished.

Fires involving electrotechnical products can 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 (all parts) [4] 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;
– minimize flame spread beyond the product's enclosure and to minimize the harmful effects of fire effluents including heat, smoke, and toxic or corrosive combustion products.

This document provides guidance to Product Committees on the power levels and amounts of energy that are likely to cause ignition and fire. It also provides guidance to Product Committees on the fire hazard safeguards that might be necessary to protect against the probability of ignition.

The probability of fire is highly dependent on the specific fire scenario within the electrotechnical product itself. Therefore, Product Committees are ultimately responsible for deciding what fire hazard safeguards are appropriate for their products.

This document was created due to a need for guidance on electrical energy levels in relation to ignition and fire. The preparation of this document is based on electrical energy levels developed by IEC/TC 108, responsible for safety of audio, video and ICT equipment.

1 Scope

This part of IEC 60695 provides guidance about the levels of power and energy that could cause ignition and fire in a low voltage electrotechnical product. It can be used by Product Committees to determine what fire hazard safeguards can be used, based on the electrical energy that could be dissipated as heat.

This document deals with products used in normal atmospheres commonly available in the home and does not deal with special locations such as those in explosive atmospheres. It is intended as guidance to IEC committees, and is intended be used with respect to their individual applications.

This basic safety publication, focusing on safety guidance, is primarily intended for use by TCs in the preparation of safety publications in accordance with the principles laid down in IEC GUIDE 104 [5] and ISO/IEC Guide 51 [6].

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 60335-1:2020, *Household and similar electrical appliances - Safety - Part 1: General requirements*

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 60695-4:2021, *Fire hazard testing - Part 4: Terminology concerning fire tests for electrotechnical products*

IEC 60695-11-10:2013, *Fire hazard testing - Part 11-10: Test flames - 50 W horizontal and vertical flame test methods*

IEC 62368-1:2023, *Audio/video, information and communication technology equipment - Part 1: Safety requirements*

ISO 13943:2017, *Fire safety - Vocabulary*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60695-4:2021 and ISO 13943:2017 (some of which are reproduced below) 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
fire hazard
physical object or condition with a potential for an undesirable consequence from fire

[SOURCE: ISO 13943:2017 [7], 3.131]

3.2
fire hazard safeguard
part or system or instruction specifically provided to reduce the likelihood of ignition (3.3) or spread of fire

Note 1 to entry: A fire hazard safeguard (3.2) is often also called a protection method.

Note 2 to entry: Examples include current limiters, distances to or from ignition (3.3) sources, materials with flame retardant properties.

3.3
ignition
initiation of combustion

[SOURCE: ISO 13943:2017 [7], 3.217]

3.4
low voltage equipment
set of electrical devices or electrical equipment necessary to perform a specific task such as generation, transmission, distribution, utilisation of electric energy and with a supply or output voltage not exceeding 1 000 V for alternating current and 1 500 V for direct current

Note 1 to entry: Examples of low voltage equipment are electric power generator, electrical switchgear and control-gear assemblies, electrical wiring systems, air conditioning units.

[SOURCE: IEC GUIDE 116 [8], 3.1]

3.5
permanently connected equipment
equipment that can only be electrically connected to or disconnected from the mains by the use of a tool

[SOURCE: IEC 62368-1:2023 [9], 3.3.3.6]

3.6
pluggable equipment type A
equipment that is intended for connection to the mains via a non-industrial plug and socket-outlet or via a non-industrial appliance coupler, or both

Note 1 to entry: Examples are plugs and socket-outlets covered by standards such as IEC TR 60083 [10] and IEC 60320-1 [11].

[SOURCE: IEC 62368-1:2023 [9], 3.3.3.7]