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Fire hazard testing -
Part 11-2: Test flames - 1 kW pre-mixed flame - Apparatus, confirmatory test arrangement and guidance

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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Fire hazard testing - Part 11-2: Test flames - 1 kW pre-mixed flame - Apparatus, confirmatory test arrangement and guidance

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IEC 60695-11-2 has been prepared by IEC technical committee 89: Fire hazard testing. It is an International Standard.

This fourth edition cancels and replaces the third edition published in 2017. This edition constitutes a technical revision.

This document has been given the status of a horizontal document in accordance with the ISO/IEC Directives, Part 1. It has the status of a basic safety publication in accordance with IEC GUIDE 104 [1] and ISO/IEC Guide 51 [2].

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

a) correction of errors in notes of Subclauses 5.2 and 5.3.

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

Draft	Report on voting
89/1675/FDIS	89/1686/RVD

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.

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

IEC 60695-11 consists of the following parts:

– IEC 60695-11-2 [3], *Test flames – 1 kW nominal pre-mixed flame – Apparatus, confirmatory test arrangement and guidance*
– IEC 60695-11-3 [4], *Test flames – 500 W flames – Apparatus and confirmational test methods*
– IEC 60695-11-4 [5], *Test flames – 50 W flame – Apparatus and confirmational test method*
– IEC 60695-11-5 [6], *Test flames – Needle-flame test method – Apparatus, confirmatory test arrangement and guidance*
– IEC 60695-11-10 [7], *Test flames – 50 W horizontal and vertical flame test methods*
– IEC 60695-11-11 [8], *Test flames – Determination of the characteristic heat flux for ignition from a non-contacting flame source*
– IEC 60695-11-20 [9], *Test flames – 500 W flame test methods*
– IEC TS 60695-11-21 [10], *Test flames - 500 W vertical flame test method for tubular polymeric materials*
– IEC TR 60695-11-30 [11], *Test flames – History and development from 1979 to 1999*
– IEC TR 60695-11-40 [12], *Test flames – Confirmatory tests – Guidance*

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 product design, as well as the choice of materials, is to reduce to acceptable levels the potential risks of fire during normal operating conditions, reasonably foreseeable abnormal use, malfunction, and/or failure. The IEC has developed IEC 60695-1-10 [13], together with its companion, IEC 60695-1-11 [14], to provide guidance on how this is to be accomplished.

The primary aims of IEC 60695-1-10 [13] and IEC 60695-1-11 [14] are to provide guidance on how:

a) to prevent ignition caused by an electrically energized component part, and

b) to confine any resulting fire within the bounds of the enclosure of the electrotechnical product in the event of ignition.

Secondary aims of these documents include the minimization of any flame spread beyond the product's enclosure and the minimization of harmful effects of fire effluents such as heat, smoke, toxicity and/or corrosivity.

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

This document provides a description of the apparatus required to produce a 1 kW test flame, and provides a description of the principle of a confirmation procedure to check that the effective power output of the flame is as intended. Guidance on confirmatory tests for test flames is given in IEC TR 60695-11-40 [12].

This part of IEC 60695 can involve hazardous materials, operations, and equipment. It does not purport to address all of the safety problems associated with its use. It is the responsibility of the user of this document to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

1 Scope

This part of IEC 60695 gives the requirements for the production and confirmation of a nominal 1 kW propane/air pre-mixed flame for use in fire hazard testing.

This basic safety publication focusing on safety test method(s) 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 [1] and ISO/IEC Guide 51 [2].

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.

This document has the status of a horizontal publication in accordance with IEC Guide 108 [3].

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 60584-1, *Thermocouples - Part 1: EMF specifications and tolerances*

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

ISO 13943:2017, *Fire safety — Vocabulary*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60695-4:2021and ISO 13943:2017 apply.

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

– IEC Electropedia: available at https://www.electropedia.org/
– ISO Online browsing platform: available at https://www.iso.org/obp

3.1
combustion
exothermic reaction of a substance with an oxidizing agent

Note 1 to entry: Combustion (3.1) generally emits fire effluent accompanied by flames (3.3) and/or glowing.

[SOURCE: ISO 13943:2017, 3.55]

3.2
draught-free environment
space in which the results of experiments are not significantly affected by the local air speed

Note 1 to entry: A qualitative example is a space in which a wax candle flame (3.3) remains essentially undisturbed. Quantitative examples are small-scale fire tests in which a maximum air speed of $0{,}1\ m \times s^{-1}$ or $0{,}2\ m \times s^{-1}$ is sometimes specified.

[SOURCE: ISO 13943:2017, 3.83]