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Fire hazard testing -
Part 11-12: Test flames - Burning droplets test for finished units

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IEC Secretariat
3, rue de Varembé
CH-1211 Geneva 20
Switzerland

Tel.: +41 22 919 02 11
info@iec.ch
www.iec.ch

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Fire hazard testing - Part 11-12: Test flames - Burning droplets test for finished units

FOREWORD

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IEC TS 60695-11-12 has been prepared by IEC technical committee 89: Fire Hazard Testing. It is a Technical Specification.

The text of this Technical Specification is based on the following documents:

Draft	Report on voting
89/1661/DTS	89/1677/RVDTS

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 Technical Specification 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 parts in the IEC 60695 series, published under the general title *Fire hazard testing*, can be found on the IEC website.

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– withdrawn, or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 abnormal heat and the potential hazards associated with abnormal heat 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 during normal operating conditions, reasonably foreseeable abnormal use, malfunction and/or failure. IEC Technical Committee 89 has developed IEC 60695-1-10 [1], together with its companion IEC 60695-1-11 [2], to provide guidance on how this is to be accomplished.

The primary aims of IEC 60695-1-10 [1] and IEC 60695-1-11 [2] 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 IEC 60695-1-10 [1] and IEC 60695-1-11 [2] include the minimization of any flame spread beyond the product's enclosure and the minimization of the harmful effects of fire effluents such as heat, smoke, toxicity and/or corrosivity.

IEC TC 108 (Safety of electronic equipment within the field of audio/video, information technology and communication technology) has used the hot flaming oil test in the past to test the adequacy of the bottom of a fire enclosure (see IEC 60950-1:2005/AMD2:2013 [3], 4.6.2 and Clause A.3, Hot Flaming Oil Test). While this test was representative in times where oil was used in components such as transformers, it was deemed too severe and not reflective of the current materials used in electrotechnical products, where the majority of the burning materials present inside the equipment are made of plastics. When a fire starts in modern equipment, it is expected that the melting material will be a mixture of plastic, copper and other materials. This mixture will have a much higher density compared to the hot flaming oil. This test method replaces the oil with a sample of plastic material as expected in the application.

1 Scope

This part of IEC 60695, which is a technical specification, describes a test method intended to investigate whether the bottom part of an enclosure having openings is able to contain the burning droplets inside the enclosure if ignition occurs inside a finished unit.

The purpose of the test is to verify whether the size of the openings in the bottom part of an enclosure are of such a size that reduces the risk of propagation of a flame outside the enclosure of a finished unit.

This technical specification is intended to be used by technical committees in the preparation of documents in accordance with the principles laid down in IEC GUIDE 104 [4] and ISO/IEC Guide 51 [5]. While this document currently does not have the status of a horizontal safety publication, it is intended to become one if the document is transformed into an International Standard.

NOTE 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 technical specification 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 TS 60695-2-21:2023, *Fire hazard testing - Part 2-21: Glowing/hot-wire based test methods - Fire containment test on finished units*

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

IEC 60695-11-4, *Fire hazard testing - Part 11-4: Test flames - 50 W flame - Apparatus and confirmational test method*

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

IEC 60695-11-20, *Fire hazard testing - Part 11-20: Test flames - 500 W flame test method*

ISO 291:2008, *Plastics - Standard atmospheres for conditioning and testing*

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, as well as 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