IEC 60695-11-2

Edition 4.0 2026-11

INTERNATIONAL STANDARD

REDLINE VERSION

BASIC SAFETY PUBLICATION

HORIZONTAL PUBLICATION

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

ICS 13.220.40

ISBN 978-2-8327-1617-5

CONTENTS

FOREWORD 2
INTRODUCTION 5
1 Scope 6
2 Normative references 6
3 Terms and definitions 6
4 Burner/supply arrangement 7
4.1 Requirements 7
4.2 Apparatus and fuel 7
4.2.1 Burner 7
4.2.2 Flow control 7
4.2.3 Copper block 8
4.2.4 Thermocouple 8
4.2.5 Temperature/time indicating/recording devices 8
4.2.6 Laboratory fume hood/chamber 8
5 Production of the test flame 8
5.1 Selection of the method 8
5.2 Method A 9
5.3 Method B (alternative) 9
6 Confirmation of the test flame 9
6.1 Principle 9
6.2 Frequency of confirmatory tests 9
6.3 Procedure 9
7 Recommended arrangements for use of the test flame 11
Annex A (normative) Burner details, arrangements and confirmatory test 12
A.1 Burner construction 12
A.2 Gas supply arrangement 18
A.3 The copper block 19
A.4 Confirmatory test 20
Bibliography 22

Figure 1 – Flame dimensions 10
~~Figure A.1 – General assembly ....~~
Figure A.1 – General Please move it back to the original position. 14
Figure A.2 – Burner details (1) 15
Figure A.3 – Burner details (2) 16
Figure A.4 – Burner details (3) 17
Figure A.5 – Burner details (4) 18
Figure A.6 – Example of supply arrangement for burner 19
Figure A.7 – Copper block 20
Figure A.8 – Confirmatory test arrangement 21

INTERNATIONAL ELECTROTECHNICAL COMMISSION

_____

Fire hazard testing - Part 11-2: Test flames - 1 kW ~~nominal~~ pre-mixed flame - Apparatus, confirmatory test arrangement and 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.
2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
6) All users should ensure that they have the latest edition of this publication.
7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
9) IEC draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). IEC takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, IEC had not received notice of (a) patent(s), which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at https://patents.iec.ch. IEC shall not be held responsible for identifying any or all such patent rights.

This redline version of the official IEC Standard allows the user to identify the changes made to the previous edition IEC 60695-11-2:2017. A vertical bar appears in the margin wherever a change has been made. Additions are in green text, deletions are in strikethrough red text.

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 ~~may~~ 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 ~~standards~~ 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 0.

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~~/IEC~~ 13943:~~2008~~2017, *Fire safety — Vocabulary*

Bibliography

[1] IEC GUIDE 104, *The preparation of safety publications and the use of basic safety publications and group safety publications*

[2] ISO/IEC Guide 51, *Safety aspects - Guidelines for their inclusion in standards*

[3] IEC GUIDE 108, *Guidelines for ensuring the coherence of IEC publications – Horizontal functions, horizontal publications and their application*

[4] IEC 60695-11-2, *Fire hazard testing - Part 11-2: Test flames - 1 kW pre-mixed flame - Apparatus, confirmatory test arrangement and guidance*

[5] IEC 60695-11-3, *Fire hazard testing - Part 11-3: Test flames - 500 W flames - Apparatus and confirmational test methods*

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

[8] IEC 60695-11-5, *Fire hazard testing - Part 11-5: Test flames - Needle-flame test method - Apparatus, confirmatory test arrangement and guidance*

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

[9] IEC 60695-11-11, *Fire hazard testing - Part 11-11: Test flames - Determination of the characteristic heat flux for ignition from a non-contacting flame source*

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

[11] IEC TS 60695-11-21, *Fire hazard testing - Part 11-21: Test flames - 500 W vertical flame test method for tubular polymeric materials*

[12] IEC TR 60695-11-30, *Fire hazard testing - Part 11-30: Test flames - History and development from 1979 to 1999*

[13] IEC ~~TS~~TR 60695-11-40, *Fire hazard testing - Part 11-40: Test flames - Confirmatory tests - Guidance*

[14] IEC 60695-1-10, *Fire hazard testing – Part 1-10: Guidance for assessing the fire hazard of electrotechnical products – General guidelines*

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

~~ISO 1337:1980, *Wrought coppers (having minimum copper contents of 99,85 %) – Chemical composition and forms of wrought products*~~

~~NOTE This publication was withdrawn without replacement in 2000-03 by ISO/TC 26. The replacement call out for electrolytic tough pitch copper is: Cu-ETP USN C11000 [6].~~