IEC TS 60695-11-40

Edition 2.0 2021-06

TECHNICAL SPECIFICATION

BASIC SAFETY PUBLICATION

Fire hazard testing –
Part 11-40: Test flames – Confirmatory tests – Guidance

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

ICS 13.220.40; 29.020

ISBN 978-2-8322-9862-6

CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

_____

FIRE HAZARD TESTING –

Part 11-40: Test flames – Confirmatory tests – 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) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

IEC TS 60695-11-40 has been prepared by IEC technical committee 89: Fire hazard testing. It is a Technical Specification.

It has the status of a basic safety publication in accordance with IEC Guide 104 and ISO/IEC Guide 51.

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

DTS	Report on voting
89/1498/DTS	89/1512/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/standardsdev/publications.

This second edition cancels and replaces the first edition published in 2002. This edition constitutes a technical revision.

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

a) former Clause 4 split into updated/rearranged new Clause 4 and Clause 5;
b) Table 1 updated and moved to new Clause 4;
c) former Clause 5 transformed to Clause 6;
d) former Clause 6 transformed to Clause 7;
e) former Clause7, Clause 8 and Clause 9 combined into an updated/rearranged new Annex A; and
f) all figures were updated.

This Technical Specification is to be used in conjunction with IEC 60695-11-2, IEC 60695-11-3, IEC 60695-11-4 and IEC 60695-11-5.

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 11 consists of the following parts:

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

Part 11-3: Test flames – 500 W flames – Apparatus and confirmational test methods

Part 11-4: Test flames – 50 W flame – Apparatus and confirmational test method

Part 11-5: Test flames – Needle-flame test method – Apparatus, confirmatory test arrangement and guidance

Part 11-10: Test flames – 50 W horizontal and vertical flame test methods

Part 11-11: Test flames – Determination of the characteristic heat flux for ignition from a non-contacting flame source

Part 11-20: Test flames – 500 W flame test methods

Part 11-30: Test flames – History and development from 1979 to 1999

Part 11-40: 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,
- replaced by a revised edition, or
- amended.

INTRODUCTION

Standard flames are specified for various small-scale fire tests. Apparatus design and test parameters are specified in an effort to ensure consistent and defined flames. Burner designs, material specifications and fuel and air specifications are typical necessary parameters. Experience has shown that the quality of the flames and the resulting test measurements are influenced significantly by subtle variations in the equipment and test technique. Simple checks on flame qualities, such as flame colour and dimensions, or the melting characteristics of silver wire, are also sometimes specified or recommended.

The need for a relatively simple check on the power of a flame has been recognized, leading to the introduction of confirmatory tests based on copper block calorimetry. This document is intended to provide information and guidance about small-scale standard flames and the various copper block confirmatory tests.

FIRE HAZARD TESTING –

Part 11-40: Test flames – Confirmatory tests – Guidance

1 Scope

This part of IEC 60695, which is a Technical Specification, presents a general characterization of small-scale test flames and associated confirmatory tests based on copper block calorimetry. Guidance is presented for the selection of critical parameters in confirmatory test designs.

NOTE A theory of thermal dynamics presents, in Annex A, additional performance parameters for confirmatory tests, enabling a precise implicit mathematical characterization of confirmatory test heating curves.

This basic safety publication is intended for use by technical committee 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. 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 60695-4:2012, *Fire hazard testing – Part 4: Terminology concerning fire tests for electrotechnical products*

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

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

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

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

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*