BS EN 60695-11-20:2015
Incorporating corrigendum January 2016



BSI Standards Publication

Fire hazard testing

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

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National foreword

This British Standard is the UK implementation of EN 60695-11-20:2015. It is identical to IEC 60695-11-20:2015, incorporating corrigendum January 2016. It supersedes BS EN 60695-11-20:1999 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee GEL/89, Fire hazard testing.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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31 March 2016	Implementation of IEC corrigendum January 2016: Figures 4.b and A.4 corrected

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English Version

Fire hazard testing - Part 11-20: Test flames - 500 W flame test methods (IEC 60695-11-20:2015)

Essais relatifs aux risques du feu - Partie 11-20: Flammes d'essai - Méthodes d'essai à la flamme de 500 W (IEC 60695-11-20:2015)

Prüfungen zur Beurteilung der Brandgefahr - Teil 11-20: Prüfflammen - Prüfverfahren mit einer 500-W-Prüfflamme (IEC 60695-11-20:2015)

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European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

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European foreword

The text of document 89/1241/FDIS, future edition 2 of IEC 60695-11-20, prepared by IEC/TC 89 "Fire hazard testing" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 60695-11-20:2015.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2016-02-27
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2018-05-27

This document supersedes EN 60695-11-20:1999.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC [and/or CEN] shall not be held responsible for identifying any or all such patent rights.

This standard covers the Principle Elements of the Safety Objectives for Electrical Equipment Designed for Use within Certain Voltage Limits (LVD - 2006/95/EC).

Endorsement notice

The text of the International Standard IEC 60695-11-20:2015 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 60695-1-10:2009	NOTE	Harmonized as 60695-1-10:2010 (not modified).
IEC 60695-1-11:2010	NOTE	Harmonized as EN 60695-1-11:2010 (not modified).
IEC 60695-1-30:2008	NOTE	Harmonized as EN 60695-1-30:2008 (not modified).
IEC 60695-11-5:2004	NOTE	Harmonized as EN 60695-11-5:2005 (not modified).
ISO 1043-1:2011	NOTE	Harmonized as EN ISO 1043-1:2011 (not modified).

Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

NOTE 1 When an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cenelec.eu.

Publication	Year	Title	EN/HD	Year
IEC 60695-4	2012	Fire hazard testing - Part 4: Terminology concerning fire tests for electrotechnical products	EN 60695-4	2012
IEC 60695-11-3	-	Fire hazard testing - Part 11-3: Test flames - 500 W flames - Apparatus and confirmational test methods	EN 60695-11-3	-
IEC 60695-11-10	-	Fire hazard testing - Part 11-10: Test flames - 50 W horizontal and vertical flame test methods	EN 60695-11-10	-
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 291	-	Plastics - Standard atmospheres for conditioning and testing	EN ISO 291	-
ISO 293	-	Plastics - Compression moulding of test specimens of thermoplastic materials	EN ISO 293	-
ISO 294-1	1996	Plastics - Injection moulding of test specimens of thermoplastic materials Part 1: General principles, and moulding of multipurpose and bar test specimens	EN ISO 294-1	1998
ISO 294-2	1996	Plastics - Injection moulding of test specimens of thermoplastic materials Part 2: Small tensile bars	EN ISO 294-2	1998

Publication	Year	Title	EN/HD	Year
ISO 294-3	1996 [1)]	Plastics - Injection moulding of test specimens of thermoplastic materials Part 3: Small plates	EN ISO 294-3	1998 [2)]
ISO 295	-	Plastics - Compression moulding of test specimens of thermosetting materials	EN ISO 295	-
ISO 845	-	Cellular plastics and rubbers - Determination of apparent density	EN ISO 845	-
ISO 13943	2008	Fire safety - Vocabulary	EN ISO 13943	2010
ISO 16012	-	Plastics - Determination of linear dimensions of test specimens	-	-

1) Superseded by ISO 294-3:2002.

2) Superseded by EN ISO 294-3:2003.

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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FIRE HAZARD TESTING –

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

FOREWORD

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International Standard IEC 60695-11-20 has been prepared by IEC technical committee 89: Fire hazard testing.

The text of this standard is based on the following documents:

FDIS	Report on voting
89/1241/FDIS	89/1250/RVD

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

This second edition cancels and replaces the first edition of IEC 60695-11-20 published in 1999. This edition constitutes a technical revision.

The main changes with respect to the first edition are listed below:

– The Part title has been modified to the singular – 500 W flame test method.
– Editorial changes have been made throughout the document for the purpose of aligning IEC 60695-11-10 with IEC 60695-11-20.
– The Introduction has been modified to clarify the description of the test method.
– The Scope has been modified for clarification.
– All occurrences of the term “fixture” have been deleted from the document.
– Preferred thickness values have been added to 7.2 and 7.3.
– 7.4.4: ‘Thickness measurement’ is now numbered 7.5 to which a new Table 1 – Thickness tolerances has been added.
– New Subclause 8.1.4 ‘Conditioning of the cotton pad’ has been added.
– 8.2.3 clarifies the application of the test flame to distorted specimens
– Explanatory notes have been added to Figures 5 and 6.
– The Bibliography has been updated and references added.

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

This International Standard is to be used in conjunction with IEC 60695-11-3.

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 publication will remain unchanged until the stability date indicated on the IEC website under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

INTRODUCTION

In the design of an 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 to a tolerable level of risk of fire even in the event of reasonably foreseeable (mis)use, malfunction or failure. Fires involving electrotechnical products can also be initiated from external non-electrical sources. Considerations of this nature are dealt with in the overall fire hazard assessment.

The aim of the IEC 60695 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.
– trying to minimise flame spread beyond the product's enclosure and to minimise the harmful effects of fire effluents including heat, smoke, and toxic or corrosive combustion products.

This part of IEC 60695 describes a test method which consists of two small-scale fire test procedures carried out on materials used in electrotechnical equipment. A 500 W test flame is used as an ignition source. The test method described provides classifications which may be used for quality assurance, the pre-selection of component materials of products, or to verify the required minimum flammability classification of materials used in end products.

This test method should not be used to solely describe or appraise the fire hazard or fire risk of materials, products, or assemblies under actual fire conditions. However, results of this test may be used as elements of a fire hazard assessment which takes into account all of the factors which are pertinent to a particular end use.

This international standard may 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 international standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

FIRE HAZARD TESTING –

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

1 Scope

This part of IEC 60695 describes a test method consisting of two small-scale laboratory test procedures which is intended to compare the burning behaviour of different materials used in electrotechnical products. Vertically oriented bar specimens or horizontally oriented plate test specimens are exposed to a small flame ignition source with a nominal thermal power of 500 W. The test method uses two test specimen configurations to classify material performance. Rectangular bar-shaped test specimens are used to assess ignitability and burning behaviour, and square plate test specimens are used to assess the resistance of the test specimen to burn-through, as defined in 8.3.3. This test method only applies to materials that have been classified as V-0 or V-1 according to IEC 60695-11-10.

This test method is only applicable to solid and cellular materials that have an apparent density of more than 250 kg/m^3, determined in accordance with ISO 845. The method does not apply to materials that shrink away from the applied flame without igniting due to their thinness.

The test method described provides classifications which may be used for quality assurance, the pre-selection of component materials of products, or to verify the required minimum flammability classification of materials used in end products. If used for pre-selection, then positive results shall be obtained at a test specimen thickness which equals the smallest thickness used in the product application.

The results obtained provide some information about the behaviour of materials in service, but cannot by themselves assure safe performance in service.

NOTE 1 Guidance on pre-selection is given in IEC 60695-1-30 [3][1].

NOTE 2 Test results are influenced by material additives, e.g. pigments, fillers, and fire retardants, and properties such as the direction of anisotropy and the molecular mass.

This basic safety publication is intended for use by technical committees in the preparation of standards 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, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

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1 Numbers in square brackets refer to the bibliography.