

### SLOVENSKI STANDARD SIST EN 60695-9-2:2014

01-junij-2014

# Preskušanje požarne ogroženosti - 9-2. del: Površinsko širjenje plamena - Pregled in primernost preskusnih metod (IEC 60695-9-2:2014)

Fire hazard testing - Part 9-2: Surface spread of flame - Summary and relevance of test methods

## iTeh STANDARD PREVIEW

Essais relatifs aux risques du feus Partie 9-2; Propagation des flammes en surface -Résumé et pertinence des méthodes d'essai

SIST EN 60695-9-2:2014

Ta slovenski standard je istoveten z: 5-81e4-47be-b3e8-15-81e4-47be-b3e8-15-92-2-2014

### ICS:

13.220.40	Sposobnost vžiga in obnašanje materialov in proizvodov pri gorenju	Ignitability and burning behaviour of materials and products
29.020	Elektrotehnika na splošno	Electrical engineering in general

SIST EN 60695-9-2:2014

en

SIST EN 60695-9-2:2014

## iTeh STANDARD PREVIEW (standards.iteh.ai)

### SIST EN 60695-9-2:2014

## EUROPEAN STANDARD NORME EUROPÉENNE EUROPÄISCHE NORM

## EN 60695-9-2

April 2014

ICS 13.220.40; 29.020

English version

### Fire hazard testing -Part 9-2: Surface spread of flame -Summary and relevance of test methods (IEC 60695-9-2:2014)

Essais relatifs aux risques du feu -Partie 9-2: Propagation des flammes en surface -Résumé et pertinence des méthodes d'essai (CEI 60695-9-2:2014) Prüfungen zur Beurteilung der Brandgefahr -Teil 9-2: Flammenausbreitung auf Oberflächen -Zusammenfassung und Anwendbarkeit der Prüfverfahren (IEC 60695-9-2:2014)

## iTeh STANDARD PKEVIEW (standards.iteh.ai)

#### SIST EN 60695-9-2:2014

https://standards.iteh.ai/catalog/standards/sist/72f4c2f5-81e4-47be-b3e8-This European Standard was approved by CENELEC on 2014-04-19. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

# CENELEC

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

© 2014 CENELEC - All rights of exploitation in any form and by any means reserved worldwide for CENELEC members.

### Foreword

The text of document 89/1202/FDIS, future edition 1 of IEC 60695-9-2, prepared by IEC/TC 89 "Fire hazard testing" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 60695-9-2:2014.

The following dates are fixed:

<ul> <li>latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement</li> </ul>		(dop)	2015-01-10
•	latest date by which the national standards conflicting with the document have to be withdrawn	(dow)	2017-04-10

This standard is to be used in conjunction with EN 60695-9-1.

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.

### **Endorsement notice**

The text of the International Standard IEC 60695-9-2:2014 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 60695-11-10	NOTE	Harmonized as EN 60695-11-10.
IEC 60695-11-20ttps://st	aNOTE.iteh.ai/a	aHarmonized as EN 60695-111-20-47be-b3e8-
IEC 60332-1-1	NOTE <sup>£2477a</sup>	8af506/sist-en-60695-9-2-2014 Harmonized as EN 60332-1-1.
IEC 60332-1-2	NOTE	Harmonized as EN 60332-1-2.
IEC 60332-1-3	NOTE	Harmonized as EN 60332-1-3.
IEC 60332-2-1	NOTE	Harmonized as EN 60332-2-1.
IEC 60332-2-2	NOTE	Harmonized as EN 60332-2-2.
IEC 60332-3-10	NOTE	Harmonized as EN 60332-3-10.
IEC 60332-3-21	NOTE	Harmonized as EN 60332-3-21.
IEC 60332-3-22	NOTE	Harmonized as EN 60332-3-22.
IEC 60332-3-23	NOTE	Harmonized as EN 60332-3-23.
IEC 60332-3-24	NOTE	Harmonized as EN 60332-3-24.
IEC 60332-3-25	NOTE	Harmonized as EN 60332-3-25.

- 3 -

# 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 When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

Publication	Year	Title	<u>EN/HD</u>	<u>Year</u>
IEC 60695-4	-	Fire hazard testing - Part 4: Terminology concerning fire tests for electrotechnical products	EN 60695-4	-
IEC 60695-9-1	-	Fire hazard testing - Part 9-1: Surface spread of flame - General guidance	EN 60695-9-1	-
IEC Guide 104	-	The preparation of safety publications and the use of basic safety publications and group safety publications	-	-
ISO/IEC Guide 51	- iT	Safety aspects - Guidelines for their Guidelines for the second s	EW	-
ISO 13943	2008	Fire safetya Vocabularys.iteh.ai)	EN ISO 13943	2010

SIST EN 60695-9-2:2014

https://standards.iteh.ai/catalog/standards/sist/72f4c2f5-81e4-47be-b3e8f2477a8af506/sist-en-60695-9-2-2014 SIST EN 60695-9-2:2014

## iTeh STANDARD PREVIEW (standards.iteh.ai)



## IEC 60695-9-2

Edition 1.0 2014-03

# INTERNATIONAL STANDARD

# NORME INTERNATIONALE

### BASIC SAFETY PUBLICATION

PUBLICATION FONDAMENTALE DE SÉCURITÉ

### Fire hazard testing Teh STANDARD PREVIEW Part 9-2: Surface spread of flame - Summary and relevance of test methods

Essais relatifs aux risques du feu <u>EN 60695-9-2:2014</u> Partie 9-2: Propagation des flammes en surface <del>21</del> Résumé et pertinence des méthodes d'essai f2477a8af506/sist-en-60695-9-2-2014

INTERNATIONAL ELECTROTECHNICAL COMMISSION

COMMISSION ELECTROTECHNIQUE INTERNATIONALE

PRICE CODE CODE PRIX



ICS 13.220.40, 29.020

ISBN 978-2-8322-1386-5

Warning! Make sure that you obtained this publication from an authorized distributor. Attention! Veuillez vous assurer que vous avez obtenu cette publication via un distributeur agréé.

 Registered trademark of the International Electrotechnical Commission Marque déposée de la Commission Electrotechnique Internationale

### CONTENTS

FOR	REWORD	)		3
INTE	RODUCT			5
1	Scope			6
2	Normati	ve referen	ces	6
3	Terms a	nd definiti	ons	7
4	Summar	ry of publis	shed test methods	11
	4.1	Small-sca	ale and intermediate-scale burning tests	11
		4.1.1	Horizontal and vertical 50 W and 500 W flame tests – IEC 60695-11-10 and IEC 60695-11-20	11
		4.1.2	Vertical burning test for cables – IEC 60332-1 [3]	12
		4.1.3	Vertical burning test for cables – IEC 60332-2 [4]	13
		4.1.4	Lateral flame spread on building and transport products – ISO 5658-2 [5]	13
		4.1.5	Intermediate scale test of vertical flame spread – ISO 5658-4 [8]	14
		4.1.6	Fire propagation apparatus, ISO 12136 [9]	15
		4.1.7	Vertical burning test for aircraft materials FAR 25 [19]	16
		4.1.8	Horizontal burning rate for road vehicle materials – ISO 3795 [20](standards.iteh.ai)	17
	4.2	Large-sc	ale burning tests	17
		4.2.1	General <u>SIST EN 60695-9-2:2014</u>	17
		4.2.2 https	s//vertical burning tests for cables (ladder tests) 0.3:8	17
		4.2.3	Vertical burning test for cables - NF C 32-070 [40]	18
		4.2.4	Vertical burning test for riser cables – UL 1666 [41]	23
		4.2.5	Horizontal flame spread test for cables – EN 50289-4-11 and NFPA 262	23
Ann	ex A (info	ormative)	Repeatability and reproducibility data - ISO 5658-2	25
Ann	ex B (info	ormative)	Repeatability and reproducibility data – ISO 5658-4	26
Ann	ex C (inf	ormative)	Repeatability and reproducibility data – NFPA 262	27
Bibli	ography			28

19
21
25
26
27
•

IEC 60695-9-2:2014 © IEC:2014

### INTERNATIONAL ELECTROTECHNICAL COMMISSION

### FIRE HAZARD TESTING -

### Part 9-2: Surface spread of flame – Summary and relevance of test methods

### 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.
- 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. (Standards.iten.al)
- 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. https://standards.iteh.ai/catalog/standards/sist/72f4c2f5-81e4-47be-b3e8-
- 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.

International Standard IEC 60695-9-2 has been prepared by IEC technical committee 89: Fire hazard testing.

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

This first edition cancels and replaces the second edition of IEC TS 60695-9-2 published in 2005. This edition constitutes a technical revision.

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

FDIS	Report on voting
89/1202/FDIS	89/1209/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.

#### - 4 -

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

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

This International standard is to be used in conjunction with IEC 60695-9-1.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC web site 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.

## iTeh STANDARD PREVIEW (standards.iteh.ai)

IEC 60695-9-2:2014 © IEC:2014

– 5 –

### INTRODUCTION

The risk of fire needs to be considered in any electrical circuit. The objective of component, circuit and equipment design, as well as the choice of materials, is to reduce the likelihood of fire, even in the event of foreseeable abnormal use, malfunction or failure.

Electrotechnical products, primarily as victims of fire, may nevertheless contribute to the fire. Fire hazard increases as the burning area increases, leading in some cases to flashover and a fully developed fire. This is a typical fire scenario in buildings. It is therefore useful to measure the rate and extent of the surface spread of flame.

This part of IEC 60695-9 describes surface spread of flame test methods in common use to assess electrotechnical products or materials used in electrotechnical products. It forms part of the IEC 60695-9 series which gives guidance to product committees wishing to incorporate test methods for surface spread of flame in product standards.

IEC 60695-9 consists of the following parts:

- Part 9-1: Surface spread of flame General guidance
- Part 9-2: Surface spread of flame Summary and relevance of test methods.

## iTeh STANDARD PREVIEW (standards.iteh.ai)

- 6 -

IEC 60695-9-2:2014 © IEC:2014

### FIRE HAZARD TESTING -

### Part 9-2: Surface spread of flame – Summary and relevance of test methods

### 1 Scope

This part of IEC 60695 presents a summary of published test methods that are used to determine the surface spread of flame of electrotechnical products or materials from which they are formed.

It represents the current state of the art of the test methods and, where available, includes special observations on their relevance and use.

The list of test methods is not to be considered exhaustive, and test methods that were not developed by IEC TC89 are not to be considered as endorsed by IEC TC89 unless this is specifically stated.

This summary cannot be used in place of published standards which are the only valid reference documents. Teh STANDARD PREVIEW

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.

### SIST EN 60695-9-2:2014

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.

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

IEC 60695-9-1, Fire hazard testing – Part 9-1: Surface spread of flame – General 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 13943:2008, *Fire Safety – Vocabulary*