

**SLOVENSKI STANDARD**  
**SIST EN 60695-11-20:2000**  
**01-september-2000**

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**Preskušanje požarne ogroženosti - 11-20. del: Preskusni plameni - Preskusne metode s 500-vatnim plamenom (IEC 60695-11-20:1999)**

Fire hazard testing -- Part 11-20: Test flames - 500 W flame test methods

Prüfungen zur Beurteilung der Brandgefahr -- Teil 11-20: Prüfflammen - Prüfverfahren mit einer 500-W-Prüfflamme

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

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**Ta slovenski standard je istoveten z: EN 60695-11-20:1999**

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**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

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**en**

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**EN 60695-11-20**

April 1999

ICS 13.220.40; 29.020

Partly supersedes HD 441 S1:1983

English version

**Fire hazard testing**  
**Part 11-20: Test flames - 500 W flame test methods**  
(IEC 60695-11-20:1999)

Essais relatifs aux risques du feu  
Partie 11-20: Flammes d'essai  
Méthodes d'essai à la flamme de 500 W  
(CEI 60695-11-20:1999)

Prüfungen zur Beurteilung der  
Brandgefahr  
Teil 11-20: Prüfflammen - Prüfverfahren  
mit einer 500-W-Prüfflamme  
(IEC 60695-11-20:1999)

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Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat 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 Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

**CENELEC**

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

**Central Secretariat: rue de Stassart 35, B - 1050 Brussels**

### Foreword

The text of document 89/316/FDIS, future edition 2 of IEC 60695-11-20, prepared by IEC TC 89, Fire hazard testing, and by SC 4, Burning behaviour, of ISO TC 61, Plastics, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 60695-11-20 on 1999-04-01.

This European Standard partly supersedes HD 411 S1:1983.

The following dates were fixed:

- latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2000-01-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2002-01-01

Annexes designated "normative" are part of the body of the standard.  
Annexes designated "informative" are given for information only.  
In this standard, annex ZA is normative and annex A is informative.  
Annex ZA has been added by CENELEC.

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### Endorsement notice

The text of the International Standard IEC 60695-11-20:1999 was approved by CENELEC as a European Standard without any modification.

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

- IEC 60695-1-1 NOTE: Harmonized as EN 60695-1-1:1995 (not modified).
- IEC 60695-4 NOTE: Harmonized as EN 60695-4:1995 (not modified).
- IEC 60707 NOTE: Harmonized as EN 60707:1999 (not modified).

**Annex ZA (normative)****Normative references to international publications  
with their corresponding European publications**

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

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

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60695-2-2	1991	Fire hazard testing Part 2: Test methods Section 2: Needle-flame test	EN 60695-2-2	1994
IEC 60695-11-3 <sup>1)</sup>		Part 11-3: Test flames - 500 W flames: Apparatus and confirmational test methods	-	-
IEC 60695-11-10	1999	Part 11-10: Test flames - 50 W horizontal and vertical flame test methods	EN 60695-11-10	1999
IEC Guide 104	1997	The preparation of safety publications and the use of basic safety publications and group safety publications	-	-
ISO/IEC Guide 51	1990	Guidelines for the inclusion of safety aspects in standards	-	-
ISO 291	1997	Plastics - Standard atmospheres for conditioning and testing	EN ISO 291	1997
ISO 293	1986	Plastics - Compression moulding of test specimens of thermoplastic materials	-	-
ISO 294	series	Plastics - Injection moulding of test specimens of thermoplastic materials	EN ISO 294	series
ISO 295	1991	Plastics - Compression moulding of test specimens of thermosetting materials	EN ISO 295	1998
ISO 845	1988	Cellular plastics and rubbers - Determination of apparent (bulk) density	EN ISO 845	1995

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1) To be published.

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BASIC SAFETY PUBLICATION

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**Essais relatifs aux risques du feu –**

**Partie 11-20:**

**Flammes d'essai –**

**Méthodes d'essai à la flamme de 500 W**

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**Fire hazard testing –**

**Part 11-20:**

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**Test flames –**

**500 W flame test methods**

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

## FIRE HAZARD TESTING –

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

## FOREWORD

- 1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the 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, the IEC publishes International Standards. Their preparation is entrusted to technical committees; any IEC national Committee interested in the subject dealt with may participate in this preparatory work. The 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 the 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 National Committees.
- 3) The documents produced have the form of recommendations for international use and are published in the form of standards, technical reports or guides and they are accepted by the National Committees in that sense.
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- 5) The IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with one of its standards.
- 6) Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. The IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 60695-11-20 has been prepared by IEC technical committee 89: Fire hazard testing, and by subcommittee 4: Burning behaviour, of ISO technical committee 61: Plastics.

This first edition replaces the pertinent parts of the first edition of IEC 60707, published in 1981.

It cancels and replaces ISO 10351, published in 1992.

This standard has the status of a basic safety standard in accordance with IEC Guide 104.

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

FDIS	Report on voting
89/316/FDIS	89/327/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.

Annex A is for information only.

The contents of the corrigendum of February 2000 have been included in this copy.

## INTRODUCTION

When considering the use of the tests in this International Standard, it is important to distinguish the term “end-product test”, meaning a fire hazard assessment test on a completed product, piece part, component or subassembly, from the term “pre-selection test”, meaning a combustion characteristic test made on a material (piece part, component or subassembly).

Pre-selection tests on materials normally use test pieces that have standardised shapes, such as a rectangular bar or sheet, and are frequently prepared using standardised moulding procedures.

It is emphasized that data using the pre-selection tests given in this standard need careful consideration to ensure their relevance to the intended application and to avoid misuse and erroneous interpretation. The actual fire performance of a part or product is affected by its surroundings, design variables such as shape and size, fabrication techniques, heat transfer effects, the type of potential ignition source and the length of exposure to it. It is important to bear in mind that these properties may also be affected by foreseeable use, abuse and environmental exposure.

The advantages of a pre-selection procedure are listed below.

- a) A material, which reacts more favourably than another when tested as a standard test specimen, will usually also react more favourably when used as a finished part in the product, provided that possible synergistic effects are avoided.
- b) Data concerning relevant combustion characteristics can aid the selection of materials, components and subassemblies during the design stage.
- c) The precision of pre-selection tests is usually higher, and their sensitivity may be superior when compared with end-product tests.
- d) Pre-selection tests may be used in a decision-making process directed to minimize fire hazards. Where applicable for the purpose of fire hazard assessment, they may lead to a reduction in the number of end-product tests, with a consequent reduction in the total testing effort.
- e) When fire hazard requirements need to be upgraded quickly, it may be possible to do this by upgrading the requirements of a pre-selection test before modifying the end-product test.
- f) The grading and classification obtained from the pre-selection test results may be used to specify a basic minimum performance of materials used in product specifications.

It should be noted that, when pre-selection testing is used to replace some of the end-product testing, it is necessary to fix an increased margin of safety in an attempt to ensure satisfactory performance of the end-product. End-product testing may avoid restrictions in innovative design and in economic material selection imposed by a pre-selection procedure. Consequently, following a pre-selection procedure, it may be necessary to implement a value analysis on the end-product, in order not to overspecify the product beyond what is strictly needed.

For electrotechnical products, IEC 60695-1-1 indicates that the risk of fire is present in any electrical circuit which is energized. With regard to this risk, the objective of component circuit and equipment design, and of the choice of materials is to reduce the likelihood of fire, even in the event of foreseeable abnormal use, malfunction or failure. The practical aim is to prevent

ignition due to the electrically energized part but, if ignition and fire occur, to control the fire, preferably within the bounds of the enclosure of the electrotechnical product.

The best method for testing electrotechnical products with regard to fire hazards is to duplicate exactly the conditions occurring in practice. In most instances this is not possible. Accordingly, for practical reasons, the testing of electrotechnical products with regard to fire hazard is best conducted by simulating as closely as possible the actual effects occurring in practice.

IEC 60695-1-3 provides that pre-selection may be made on the basis of specified tests and by the use of specifications of the necessary resistance to fire and related combustion characteristics. It also outlines guidance that is intended to relate the specific function of the electrotechnical product, its subassemblies and its parts to the tested properties of materials, and to demonstrate the significance and the limitations of such a pre-selection procedure.

ISO/TR 10840 summarises specific problems associated with the fire testing of plastics, which should be taken into account when assessing and interpreting test results.

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