



# SLOVENSKI STANDARD

## SIST EN 60691:2017

01-april-2017

Nadomešča:

SIST EN 60691:2004

SIST EN 60691:2004/A1:2007

SIST EN 60691:2004/A2:2010

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**Termični taljivi vložki - Zahteve in navodilo za uporabo (IEC 60691:2015 + popravek COR1:2016)**

Thermal-links - Requirements and application guide (IEC 60691:2015 + COR1:2016)

iTeh STANDARD PREVIEW

Temperatursicherungen - Anforderungen und Anwendungshinweise (IEC 60691:2015 + COR1:2016)

[SIST EN 60691:2017](https://standards.iteh.ai/catalog/standards/sist/96762518-2aa-4023-8258-3955cd072/sist-en-60691-2017)

Protecteurs thermiques - Exigences et guide d'application (IEC 60691:2015 + COR1:2016)

**Ta slovenski standard je istoveten z: EN 60691:2016**

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**ICS:**

29.120.50

Varovalke in druga  
medtokovna zaščita

Fuses and other overcurrent  
protection devices

**SIST EN 60691:2017**

**en,fr,de**

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EUROPEAN STANDARD

**EN 60691**

NORME EUROPÉENNE

EUROPÄISCHE NORM

October 2016

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Supersedes EN 60691:2003

English Version

**Thermal-links -  
Requirements and application guide  
(IEC 60691:2015 + COR1:2016)**Protecteurs thermiques -  
Exigences et guide d'application  
(IEC 60691:2015 + COR1:2016)Temperatursicherungen -  
Anforderungen und Anwendungshinweise  
(IEC 60691:2015 + COR1:2016)

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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.

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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**

## European foreword

The text of document 32C/512/FDIS, future edition 4 of IEC 60691, prepared by SC 32C "Miniature fuses", of IEC/TC 32 "Fuses" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 60691:2016.

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) 2017-04-07
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2019-10-07

This document supersedes EN 60691:2003.

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.

**iTeh STANDARD PREVIEW**

This document has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association.

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**Endorsement notice**

The text of the International Standard IEC 60691:2015 + COR1:2016 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 60085:2007	NOTE	Harmonized as EN 60085:2008 (not modified).
IEC 60695-10-3:2002	NOTE	Harmonized as EN 60695-10-3:2002 (not modified).
IEC 60695-11-20:1999/A1:2003	NOTE	Harmonized as EN 60695-11-20:1999/A1:2003 (not modified).
IEC 60127-1:2006/A1:2011	NOTE	Harmonized as EN 60127-1:2006/A1:2011 (not modified).
IEC 60216-1:2013	NOTE	Harmonized as EN 60216-1:2013 (not modified).
IEC 60695-2-11:2014	NOTE	Harmonized as EN 60695-2-11:2014 (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](http://www.cenelec.eu).

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60065 (mod)	2014	Audio, video and similar electronic apparatus - Safety requirements	EN 60065	2014
IEC 60112 + A1	2003 2009	Method for the determination of the proof and the comparative tracking indices of solid insulating materials	EN 60112 + A1	2003 2009
IEC 60127-2	2014	Miniature fuses - Part 2: Cartridge fuse-links	EN 60127-2	2014
IEC 60216-5	2008	Electrical insulating materials - Thermal endurance properties - Part 5: Determination of relative thermal endurance index (RTE) of an insulating material	EN 60216-5	2008
IEC 60664-1	2007	Insulation coordination for equipment within low-voltage systems - Part 1: Principles, requirements and tests	EN 60664-1	2007
IEC 60695-2-12 + A1	2010 2014	Fire hazard testing - Part 2-12: Glowing/hot-wire based test methods - Glow-wire flammability index (GWFI) test method for materials	EN 60695-2-12 + A1	2010 2014
IEC 60695-2-13 + A1	2010 2014	Fire hazard testing - Part 2-13: Glowing/hot-wire based test methods - Glow-wire ignition temperature (GWIT) test method for materials	EN 60695-2-13 + A1	2010 2014
IEC 60695-10-2	2014	Fire hazard testing - Part 10-2: Abnormal heat - Ball pressure test method	EN 60695-10-2	2014

**EN 60691:2016**

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60695-11-10	2013	Fire hazard testing - Part 11-10: Test flames - 50 W horizontal and vertical flame test methods	EN 60695-11-10	2013
IEC 60730-1 (mod)	2013	Automatic electrical controls - Part 1: General requirements	EN 60730-1	2016
IEC 61210 (mod)	2010	Connecting devices - Flat quick-connect terminations for electrical copper conductors - Safety requirements	EN 61210	2010

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IEC 60691

Edition 4.0 2015-10

# INTERNATIONAL STANDARD

# NORME INTERNATIONALE

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Thermal-links – Requirements and application guide

Protecteurs thermiques – Exigences et guide d'application

[SIST EN 60691:2017](https://standards.iteh.ai/catalog/standards/sist/96762518-f2aa-4023-8258-5653cde24072/sist-en-60691-2017)

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

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**THERMAL-LINKS –  
REQUIREMENTS AND APPLICATION GUIDE****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.
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International Standard IEC 60691 has been prepared by subcommittee 32C: Miniature fuses, of IEC technical committee 32: Fuses.

This fourth edition cancels and replaces the third edition published in 2002, Amendment 1: 2006 and Amendment 2: 2010. This fourth edition constitutes a technical revision.

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

- a) requirements for thermal-link packaged assemblies;
- b) renew the requirements and definitions for  $T_h$ -test;
- c) change starting temperature for interrupt current test;
- d) clarify requirements for marking (packing label);
- e) minimum Proof Tracking Index 175 instead 120.

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

FDIS	Report on voting
32C/512/FDIS	32C/515/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.

The basis for this standard is the harmonization of the USA national standard, UL 1020, fifth edition (withdrawn 2003), and IEC 60691:1993, together with its Amendment 1:1995 and Amendment 2:2000.

The following differing practices of a less permanent nature exist in the country indicated below:

- Annex C is required to be declared in the USA;
- Annex E is required in the USA, if applicable;
- Annex F is required to be declared in the USA.

In this standard, the following type is used:

- *compliance statements: in italic type.*

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, <https://standards.iteh.ai/catalog/standards/sist/96762518-f2aa-4023-8258-5653cde24072/sist-en-60691-2017>
- withdrawn,
- replaced by a revised edition, or
- amended.

The contents of the corrigendum of August 2016 have been included in this copy.

## INTRODUCTION

Thermal-links, defined as non-resettable devices functioning once only without refunctioning, are widely applied for the thermal protection of equipment in which, under fault (abnormal) conditions, one or more parts may reach hazardous temperatures.

As these devices have several aspects in common with miniature fuse-links and are used for obtaining a comparable degree of protection, this standard has endeavoured to lay down a number of basic requirements for such devices.

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## THERMAL-LINKS – REQUIREMENTS AND APPLICATION GUIDE

### 1 Scope

This International Standard is applicable to thermal-links intended for incorporation in electrical appliances, electronic equipment and component parts thereof, normally intended for use indoors, in order to protect them against excessive temperatures under abnormal conditions.

NOTE 1 The equipment is not designed to generate heat.

NOTE 2 The effectiveness of the protection against excessive temperatures logically depends upon the position and method of mounting of the thermal-link, as well as upon the current which it is carrying.

This standard may be applicable to thermal-links for use under conditions other than indoors, provided that the climatic and other circumstances in the immediate surroundings of such thermal-links are comparable with those in this standard.

This standard may be applicable to thermal-links in their simplest forms (e.g. melting strips or wires), provided that molten materials expelled during function cannot adversely interfere with the safe use of the equipment, especially in the case of hand-held or portable equipment, irrespective of its position.

Annex H of this standard is applicable to thermal-link packaged assemblies where the thermal-link(s) has already been approved to this standard but packaged in a metallic or non-metallic housing and provided with terminals/wiring leads.

This standard is applicable to thermal-links with a rated voltage not exceeding 690 V a.c. or d.c. and a rated current not exceeding 63 A.

The objectives of this standard are:

- a) to establish uniform requirements for thermal-links,
- b) to define methods of test,
- c) to provide useful information for the application of thermal-links in equipment.

This standard is not applicable to thermal-links used under extreme conditions such as corrosive or explosive atmospheres.

This standard is not applicable to thermal-links to be used in circuits on a.c. with a frequency lower than 45 Hz or higher than 62 Hz.

### 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 60065:2014, *Audio, video and similar electronic apparatus – Safety requirements*

IEC 60112:2003, *Method for the determination of the proof and the comparative tracking indices of solid insulating materials*  
IEC 60112:2003/AMD1:2009

IEC 60127-2:2014, *Miniature fuses – Part 2: Cartridge fuse-links*

IEC 60216-5:2008, *Electrical insulating materials – Thermal endurance properties – Part 5: Determination of relative thermal endurance index (RTE) of an insulating material*

IEC 60664-1:2007, *Insulation coordination for equipment within low-voltage systems – Part 1: Principles, requirements and tests*

IEC 60695-2-12:2010, *Fire hazard testing – Part 2-12: Glowing/hot-wire based test methods – Glow-wire flammability index (GWFI) test method for materials*  
IEC 60695-2-12:2010/AMD1:2014

IEC 60695-2-13:2010, *Fire hazard testing – Part 2-13: Glowing/hot-wire based test methods – Glow-wire ignition temperature (GWIT) test method for materials*  
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IEC 60695-10-2:2014, *Fire hazard testing – Part 10-2: Abnormal heat – Ball pressure test method*

IEC 60695-11-10:2013, *Fire hazard testing – Part 11-10: Test flames – 50 W horizontal and vertical flame test methods*

IEC 60730-1:2013, *Automatic electrical controls – Part 1: General requirements*

IEC 61210:2010, *Connecting devices – Flat quick-connect terminations for electrical copper conductors – Safety requirements*

### 3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

#### 3.1

##### **clearance**

shortest distance in air between two conductive parts

#### 3.2

##### **creepage distance**

shortest distance along the surface of insulating material between two conductive parts

#### 3.3

##### **holding temperature**

$T_h$

maximum temperature of the thermal-link at which it will not change its state of conductivity during a specified time at the rated current

Note 1 to entry: The minimum permissible value of  $T_h$  is 35 °C.

#### 3.4

##### **homogeneous series**

series of thermal-links having the same external dimensions and common overall construction, deviating from each other only in such characteristics (including ratings) that, for a given test,

the testing of one or a reduced number of particular thermal-links of that series shall be taken as representative for all the thermal-links of the series

### 3.5 interrupting current

$I_b$   
value of the current that the thermal-link is capable of interrupting at rated voltage and under specified circuit conditions

### 3.6 maximum temperature limit

$T_m$   
temperature of the thermal-link stated by the manufacturer, up to which the mechanical and electrical properties of the thermal-link, having changed its state of conductivity, will not be impaired for a given time

### 3.7 pilot duty

rating assigned to a switching device that controls the coil of another electro-mechanical device such as a solenoid, relay or contactor

### 3.8 portable equipment

equipment which is moved while in operation or which can easily be moved from one place to another while connected to the supply

### 3.9 rated current

$I_r$   
current used to classify a thermal-link

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### 3.10 rated functioning temperature

$T_f$   
temperature of the thermal-link which causes it to change its state of conductivity with a detection current up to 10 mA as the only load

### 3.11 rated voltage

$U_r$   
voltage used to classify a thermal-link

### 3.12 thermal element

metallic or non-metallic fusible material that is part of a thermal-link and is responsive to temperature by a change of state such as from solid to liquid at the temperature for which it is calibrated

### 3.13 thermal-link

non-resettable device incorporating a thermal element, which will open a circuit once only when exposed for a sufficient length of time to a temperature in excess of that for which it has been designed