BS EN 60691:2016+A1:2019
Incorporating corrigendum August 2016



BSI Standards Publication

Thermal-links - Requirements and application guide

bsi.

National foreword

This British Standard is the UK implementation of EN 60691:2016+A1:2019. It is identical to IEC 60691:2015, incorporating corrigendum August 2016 and amendment 1:2019. It supersedes BS EN 60691:2016, which will be withdrawn on 15 February 2022.

The start and finish of text introduced or altered by amendment is indicated in the text by tags. Tags indicating changes to IEC text carry the number of the IEC amendment. For example, text altered by IEC amendment A1 is indicated by [A1] 〈A1〉.

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The UK participation in its preparation was entrusted to Technical Committee PEL/32, Fuses.

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

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Published by BSI Standards Limited 2019

ISBN 978 0 580 97502 8

ICS 29.120.50

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This British Standard was published under the authority of the Standards Policy and Strategy Committee on 30 November 2016.

Amendments/corrigenda issued since publication

Date	Text affected
30 June 2019	Implementation of IEC amendment 1:2019 with CENELEC endorsement A1:2019

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 60691:2016 +A1

April 2019

ICS 29.120.50

English Version

Thermal-links - Requirements and application guide

Protecteurs thermiques - Exigences et guide d'application

Temperatursicherungen - Anforderungen und Anwendungshinweise

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- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2019-10-07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

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

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).

Foreword to amendment A1

The text of document 32C/548/FDIS, future IEC 60691/A1, 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/A1:2019.

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) 2019-11-15
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2022-02-15

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For the relationship with EU Directive(s), see informative Annex ZZ, included in this document.

Endorsement notice

The text of the International Standard IEC 60691:2015/A1:2019 was approved by CENELEC as a European Standard without any modification.

Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

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.

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 60065 (mod)	2014	Audio, video and similar electronic apparatus - Safety requirements	EN 60065	2014
—	—		+ A11	2017
IEC 60112	2003	Method for the determination of the proof and the comparative tracking indices of solid insulating materials	EN 60112	2003
+ A1	2009		+ A1	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	2010	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	2010
+ A1	2014		+ A1	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	EN 60695-2-13	2010
+ A1	2014		+ A1	2014
IEC 60695-10-2	2014	Fire hazard testing - Part 10-2: Abnormal heat - Ball pressure test method	EN 60695-10-2	2014
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

Publication	Year	Title	EN/HD	Year
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

Annex ZZ
(informative)

Relationship between this European standard and the safety objectives of Directive 2014/35/EU [2014 OJ L96] aimed to be covered

This European Standard has been prepared under a Commission's standardization request relating to harmonized standards in the field of the Low Voltage Directive, M/511, to provide one voluntary means of conforming to safety objectives of Directive 2014/35/EU of the European Parliament and of the Council of 26 February 2014 on the harmonization of the laws of the Member States relating to the making available on the market of electrical equipment designed for use within certain voltage limits [2014 OJ L96].

Once this standard is cited in the Official Journal of the European Union under that Directive, compliance with the normative clauses of this standard given in Table ZZ.1 confers, within the limits of the scope of this standard, a presumption of conformity with the corresponding safety objectives of that Directive, and associated EFTA regulations.

Table ZZ.1 — Correspondence between this European standard and Annex I of Directive 2014/35/EU [2014 OJ L96]

Safety objectives of Directive 2014/35/EU	Clause(s) / sub-clause(s) of this EN	Remarks / Notes
1.General conditions		
1(a) the essential characteristics, the recognition and observance of which will ensure that electrical equipment will be used safely and in applications for which it was made, shall be marked on the electrical equipment, or, if this is not possible, on an accompanying document	7 Marking; 8 Documentation; Annex A Application guide	
1(b) the electrical equipment, together with its component parts, shall be made in such a way as to ensure that it can be safely and properly assembled and connected	4 General requirements; 5 General notes on tests; 7 Marking; 8 Documentation; 10.3 Interrupting current; 10.5 Limited short-circuit test; 10.5.4 Compliance; 13 Manufacturer's validation program; Annex A Application guide	
1(c) the electrical equipment shall be so designed and manufactured as to ensure that protection against the hazards set out in points 2 and 3 is assured, providing that the equipment is used in applications for which it was made and is adequately maintained	Annex A Application guide	
2.Protection against hazards arising from the electrical equipment		

Safety objectives of Directive 2014/35/EU	Clause(s) / sub-clause(s) of this EN	Remarks / Notes
2(a) persons and domestic animals are adequately protected against the danger of physical injury or other harm which might be caused by direct or indirect contact	4 General requirements; 5 General notes on test; 6.1 Electrical conditions; 6.3 & 9.6 Resistance to tracking; 9.7 Creepage distances and clearances; 10.1 Dielectric strength; 10.2 Insulation resistance; 10.3 Interrupting current; 10.4 Transient overload current; 10.5 Limited short-circuit test; 11 Temperature tests; 13 Manufacturer's validation programme	
2(b) temperatures, arcs or radiation which would cause a danger, are not produced	4 General requirements; 5 General notes on test; 6.3 & 9.6 Resistance to tracking; 9.7 Creepage distances and clearances; 10.1 Dielectric strength; 10.2 Insulation resistance; 10.3 Interrupting current; 10.4 Transient overload current; 10.5 Limited short-circuit test; 11 Temperature tests; 13 Manufacturer's validation programme	
2(c) persons, domestic animals and property are adequately protected against non-electrical dangers caused by the electrical equipment which are revealed by experience	4 General requirements; 4.3 ; 5 General notes on test; 10.3 Interrupting current; 11 Temperature tests; 13 Manufacturer's validation programme	
2(d) the insulation is suitable for foreseeable conditions	4 General requirements; 5 General notes on test; 6.3 & 9.6 Resistance to tracking; 9.7 Creepage distances and clearances; 10.1 Dielectric strength; 10.2 Insulation resistance; 13 Manufacturer's validation programme	
3.Protection against hazards which may be caused by external influences on the electrical equipment		
3(a) meets the expected mechanical requirements in such a way that persons, domestic animals and property are not endangered	4 General requirements; 5 General notes on test; 9 Constructional requirements; 10.3 Interrupting current; 10.5 Limited short-circuit test; 11.5 Ageing; 13 Manufacturers validation programme	
3(b) is resistant to non-mechanical influences in expected environmental conditions, in such a way that persons, domestic animals and property are not endangered	9.8 Temperature and humidity cycle conditioning; 10.1 Dielectric strength; 10.2 Insulation resistance; 12 Resistance to rusting;	
3(c) does not endanger persons, domestic animals and property in foreseeable conditions of overload	4 General requirements; 5 General notes on test; 10.4 Transient overload current	

WARNING 1 — Presumption of conformity stays valid only as long as a reference to this European standard is maintained in the list published in the Official Journal of the European Union. Users of this standard should consult frequently the latest list published in the Official Journal of the European Union.

WARNING 2 — Other Union legislation may be applicable to the product(s) falling within the scope of this standard.

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FOREWORD

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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/F DIS	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 perm anent nature ex ist in the countr y 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,
- withdrawn,
- replaced by a revised edition, or
- amended.

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

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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 nonmetallic 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 materialsIEC 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*