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# INTERNATIONAL STANDARD

CONSOLIDATED VERSION

**Thermal-links - Requirements and application guide**

## CONTENTS

FOREWORD .....	4
INTRODUCTION .....	6
1 Scope .....	7
2 Normative references .....	7
3 Terms and definitions .....	8
4 General requirements .....	10
5 General notes on tests .....	10
6 Classification .....	12
6.1 Electrical conditions .....	12
6.2 Thermal conditions .....	13
6.3 Resistance to tracking .....	13
7 Marking .....	13
8 Documentation .....	14
9 Constructional requirements .....	14
9.1 General .....	14
9.2 Lead secureness tests .....	15
9.2.1 General .....	15
9.2.2 Tensile test .....	15
9.2.3 Thrust test .....	16
9.2.4 Bending/twist test .....	16
9.3 Contacts used for the current path .....	17
9.4 Accessible mounting brackets or metal parts .....	17
9.5 Insulating materials .....	17
9.6 Resistance to tracking .....	17
9.7 Creepage distances and clearances .....	17
9.8 Temperature and humidity cycle conditioning .....	18
9.9 Terminals and terminations .....	18
10 Electrical requirements .....	19
10.1 Dielectric strength .....	19
10.2 Insulation resistance .....	19
10.3 Interrupting current .....	20
10.3.1 General .....	20
10.3.2 Specific conditions .....	20
10.4 Transient overload current .....	21
10.5 Limited short-circuit test .....	22
10.5.1 General .....	22
10.5.2 Test method .....	22
10.5.3 Fuse size (rating) .....	23
10.5.4 Compliance .....	23
11 Temperature tests .....	23
11.1 General .....	23
11.2 Holding temperature, $T_h$ .....	24
11.3 Rated functioning temperature, $T_f$ .....	24
11.4 Maximum temperature limit, $T_m$ .....	24
11.5 Ageing .....	25

12	Resistance to rusting .....	25
13	Manufacturer's validation programme .....	26
	Annex A (normative) Application guide .....	27
	Annex B (normative) Alternative ageing test for thermal-links with $T_h$ greater than 250 °C for use in electric irons .....	28
	Annex C (normative) Conductive heat ageing test.....	29
	C.1 Conductive heat ageing test.....	29
	C.2 Method .....	29
	C.2.1 General .....	29
	C.2.2 Typical test fixture assembly.....	29
	C.2.3 Temperature setting .....	29
	C.2.4 Temperature behaviour.....	29
	C.2.5 Temperature monitoring.....	30
	C.3 Ageing .....	30
	C.3.1 General .....	30
	C.3.2 Cooling operation .....	30
	C.3.3 Premature operation .....	30
	C.4 Results .....	31
	C.5 Dielectric strength test .....	31
	C.6 Test oven.....	31
	Annex D (informative) Extended holding temperature evaluation.....	33
	D.1 Extended holding temperature conditioning test.....	33
	D.2 Load current interrupt test.....	33
	Annex E (normative) Seal ageing test .....	35
	Annex F (normative) Identification requirements .....	37
	Annex G (normative) Indelibility of markings .....	38
	Annex H (normative) Requirements for thermal-link packaged assemblies .....	39
	Annex I (informative) Holding temperature .....	43
	Bibliography.....	44
	 Figure 1 – Bending/twist test.....	16
	Figure C.1 – Typical test fixture assembly.....	31
	Figure C.2 – Typical thermal-link test oven .....	32
	Figure D.1 – Typical terminal block support test fixture .....	34
	Figure E.1 – Conditioning time versus oven temperature for proposed temperature index.....	36
	Figure G.1 – Apparatus for testing durability of markings .....	38
	 Table 1 – Test schedule.....	12
	Table 2 – Strength of leads and terminal parts – Minimum required tensile and thrust test forces.....	16
	Table 3 – Creepage distances and clearances (absolute minimum values) .....	18
	Table 4 – Test voltages for dielectric strength.....	19
	Table 5 – Test current for interrupting test .....	20
	Table 6 – Limited short-circuit test capacity .....	22
	Table H.1 – Push and pull force .....	41

Table H.2 – Minimum nominal cross-sectional area of conductor .....41

Table H.3 – Allowed values for the materials used in the thermal-link package .....42

## INTERNATIONAL ELECTROTECHNICAL COMMISSION

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### **Thermal-links - Requirements and application guide**

#### FOREWORD

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This consolidated version of the official IEC Standard and its amendments has been prepared for user convenience.

IEC 60691 edition 5.2 contains the fifth edition (2023-03) [documents 32C/604/FDIS and 32C/605/RVD], its amendment 1 (2024-10) [documents 32C/645/FDIS and 32C/648/RVD] and its amendment 2 (2026-02) [documents 32C/677/FDIS and 32C/678/RVD].

In this Redline version, a vertical line in the margin shows where the technical content is modified by amendments 1 and 2. Additions are in green text, deletions are in strikethrough red text. A separate Final version with all changes accepted is available in this publication.

IEC 60691 has been prepared by subcommittee 32C: Miniature fuses, of IEC technical committee 32: Fuses. It is an International Standard.

This fifth edition cancels and replaces the fourth edition published in 2015 and Amendment 1:2019. This edition constitutes a technical revision.

This fifth 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;

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 have served as a basis for the elaboration of this standard.

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at [www.iec.ch/members\\_experts/refdocs](http://www.iec.ch/members_experts/refdocs). The main document types developed by IEC are described in greater detail at [www.iec.ch/publications](http://www.iec.ch/publications).

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 document and its amendments will remain unchanged until the stability date indicated on the IEC website under [webstore.iec.ch](http://webstore.iec.ch) in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn, or
- revised.

## 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.

## 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 document 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 document 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 document 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 document is applicable to thermal-links with a rated voltage not exceeding 690 V AC or DC and a rated current not exceeding 63 A.

The objectives of this document are:

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

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

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

## 2 Normative references

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.

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

IEC 60112:2020, *Method for the determination of the proof and the comparative tracking indices of solid insulating materials*

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*



## Bibliography

IEC 60085:2007, *Electrical insulation – Thermal evaluation and designation*

IEC 60695-10-3:2016, *Fire hazard testing – Part 10-3: Abnormal heat – Mould stress relief distortion test*

IEC 60695-11-20:2015, *Fire hazard testing – Part 11-20: Test flames – 500 W flame test methods*

IEC 60127-1:2006, *Miniature fuses – Part 1: Definitions for miniature fuses and general requirements for miniature fuse-links*

IEC 60127-1:2006/AMD1:2011

IEC 60127-1:2006/AMD2:2015

IEC 60216-1:2013, *Electrical insulating materials – Thermal endurance properties – Part 1: Ageing procedures and evaluation of test results*

IEC 60695-2-11:2021, *Fire hazard testing – Part 2-11: Glowing/hot-wire based test methods – Glow-wire flammability test method for end-products (GWEPT)*

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