

INTERNATIONAL STANDARD

IEC 60691

2002

AMENDMENT 1
2006-09

Amendment 1

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

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FOREWORD

This amendment has been prepared by subcommittee 32C: Miniature fuses, of IEC technical committee 32: Fuses.

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

FDIS	Report on voting
32C/395/FDIS	32C/400/RVD

Full information on the voting for the approval of this amendment can be found in the report on voting indicated in the above table.

The committee has decided that the contents of this amendment and the base publication will remain unchanged until the maintenance result 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- withdrawn,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.

A bilingual version of this amendment may be issued at a later date.

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Add, after Clause 12, the following new Clause heading:

13 Manufacturer's validation programme

Page 5

FOREWORD

Add the following new paragraphs 7), 8) and 9) to the first part of the Foreword:

- 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.

Replace the last paragraph on page 5 by the following:

The basis for this standard is the harmonization of the USA national standard, UL 1020, fifth edition (withdrawn 2003), and IEC 60691, second edition, together with its amendments 1 and 2.

Page 7

Replace the first paragraph by the following:

The committee has decided that the contents of this publication will remain unchanged until the maintenance result date¹⁾ 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

A bilingual version of this amendment may be issued at a later date.

Add the following footnote to the bottom of page 7:

1) The National Committees are requested to note that for this publication the maintenance result date is 2009.

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2 Normative references

Add, after IEC 60065:2001, the following:

"Amendment 1 (2005)

Replace the reference to IEC 60085:1984, by the following:

IEC 60085:2004, *Electrical insulation – Thermal classification*

Replace the reference to IEC 60112 (including its footnote) by the following:

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

Add, after IEC 60664-1, the following:

Amendment 1 (2000)

Amendment 2 (2002)

Replace the reference to IEC 60695-10-2:1995 by the following:

IEC 60695-10-2:2003, *Fire hazard testing – Part 10-2: Abnormal heat – Ball pressure test*

Add, after IEC 60695-11-10:1999, the following:

Amendment 1 (2003)

Add, after IEC 60730-1:1999, the following:

Amendment 1 (2003)

Delete the reference to UL 1020:1994.

Page 15

3 Definitions

Replace the existing definition 3.7 by the following:

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

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5 General notes on tests

Replace the existing Clause 5 by the following:

5 General notes on tests

Unless otherwise specified, all tests shall be carried out under the following atmospheric conditions:

Temperature: 15 °C to 35 °C

Relative humidity: 25 % to 75 %

Air pressure: $8,6 \times 10^4$ Pa to $1,06 \times 10^5$ Pa

Where the above-mentioned conditions have a significant influence, they shall be kept substantially constant during the tests.

If the temperature limits given in this clause are too wide for certain tests, these shall be repeated, in case of doubt, at a temperature of (23 ± 1) °C.

In every test report, the ambient temperature shall be stated. If the standard conditions for relative humidity or pressure are not fulfilled during the tests, a note to this effect shall be added to the report.

If the result of a test is influenced, to an appreciable extent, by the position and method of mounting of the specimen, the most unfavourable condition shall be chosen for the relevant tests and recorded.

If a thermal-link has been specifically designed for use in a special type of equipment and cannot be tested separately, the tests of this standard shall be performed in that equipment or in the relevant part of it, or similar.

When testing a homogeneous series of thermal-links, all the tests shall be applied to thermal-links with the lowest and highest T_f . Thermal-links with intermediate rated functioning temperatures need only be subjected to tests according to 10.6, 11.2, 11.3 and 11.4.

The total number of specimens required is 45. Out of a total of 45 specimens, 15 are kept as spares in case some of the tests have to be repeated. Out of a total of 45 specimens, 30 are divided into groups assigned an alphabetical letter from A to J. Each group consists of three specimens. In general, tests shall be performed in the order indicated in Table 1 but, if so required, tests may be repeated, for example the test on marking (see Clause 7). Additional samples may be needed according to Note 2 of Table 1.

NOTE 1 For optional tests, additional samples will be required per the annexes.

If, in any of the tests carried out in accordance with any clause, a failure is reported, the cause of the failure will be identified and corrective action taken. Based on the failure analysis report and the corrective action, at a minimum, that test sequence shall be repeated on twice the number of revised specimens and no further failures are allowed.

The conductive heat ageing test of Annex C is applicable when declared by the manufacturer.

Exception: The conductive heat ageing test may be omitted if the thermal link is constructed without contacts.

NOTE 2 In the USA the conductive heat ageing test is required to be declared.

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Table 1 – Test schedule

Clause or subclause	Test	Specimen groups									
		A	B	C	D	E	F	G	H	I	J
7*	Marking (rub test)	X	X								
9	Mechanical requirements										
9.2*	Tensile force	X									
9.3*	Thrust force		X								
9.4*	Bending/twist force			X							
10	Electrical requirements										
10.1*	Creepage distances and clearances						X	X			
10.2*	Temperature and humidity cycle conditioning	X	X	X			X	X			
12*	Resistance to rusting (ferrous parts only)	X	X	X							
10.3*	Dielectric strength (if applicable)	X	X	X			X	X			
10.4*	Insulation resistance (if applicable)	X	X	X			X	X			
10.5*	Resistance to tracking				X	X					
10.6	Interrupting current						X	X			
10.7*	Transient overload current	X	X						X		
11	Temperature tests										
11.2	Check on T_f	X		X							
11.3	Check on T_m followed by dielectric test and insulation resistance			X	X						
11.4	Ageing step 1 (optional) 21 days step 2 (mandatory) 21 days step 3 (mandatory) 14 days step 4 (mandatory) 7 days step 5 (mandatory) 7 days step 6 (mandatory) 24 h		X			X			X	X	X
10.3	Dielectric strength	X	X			X	X	X	X	X	X
10.4	Insulation resistance	X	X			X	X	X	X	X	X
7*	Marking (visual inspection only)	X	X								
NOTE 1 For homogeneous series, tests marked with an asterisk may be omitted for intermediate ratings.											
NOTE 2 If the conditions of voltage, power and current in c), d) and e) of 10.6.2 are not covered by one test, a minimum of three samples should be tested for each condition.											

7 Marking

Replace, on page 25, the penultimate paragraph of Clause 7 (which starts with “The marking in accordance with a), b), c) etc.”) by the following:

If the thermal-link is small in size, and not intended to be replaced, the markings in accordance with a), b), c) and d) above shall be printed on the packaging, together with a reference to this standard.