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INTERNATIONAL STANDARD

Miniature fuses –
Part 7: Miniature fuse-links for special applications

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MINIATURE FUSES –

Part 7: Miniature fuse-links for special applications

FOREWORD

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International Standard IEC 60127-7 has been prepared by subcommittee 32C: Miniature fuses, of IEC technical committee 32: Fuses.

This second edition cancels and replaces the first edition published in 2013.

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

a) defining a test board for surface mount fuse-links, Figure 2;
b) defining test schedules for homogenous series.

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

CDV	Report on voting
32C/507/CDV	32C/513/RVC

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.

A list of all parts in the IEC 60127 series, published under the general title *Miniature fuses*, can be found on the IEC website.

This International Standard is to be used in conjunction with IEC 60127-1:2006, *Miniature fuses – Part 1: Definitions for miniature fuses and general requirements for miniature fuse-links* and its Amendment 1 (2011).

The clauses of this standard supplement, modify or replace the corresponding clauses in IEC 60127-1.

Where there is no corresponding clause or subclause in this standard, the clause or subclause of IEC 60127-1 applies without modification as far as is reasonable. When this standard states “addition” or “replacement”, the relevant text in IEC 60127-1 is to be adapted accordingly.

Subclauses which are additional to those in Part 1 are numbered starting from 101. Additional annexes are numbered AA, BB, etc.

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- withdrawn,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.

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

INTRODUCTION

According to the wish expressed by the users of miniature fuses, all standards, recommendations and other documents relating to miniature fuses should have the same publication number in order to facilitate reference to fuses in other specifications, for example, equipment specifications.

Furthermore, a single publication number and subdivision into parts would facilitate the establishment of new standards, because clauses containing general requirements need not be repeated.

The IEC 60127 series, under the general heading *Miniature fuses*, is thus subdivided as follows:

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

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

IEC 60127-3, *Miniature fuses – Part 3: Sub-miniature fuse-links*

IEC 60127-4, *Miniature fuses – Part 4: Universal modular fuse-links (UMF) – Through-hole and surface mount types*

IEC 60127-5, *Miniature fuses – Part 5: Guidelines for quality assessment of miniature fuse-links*

IEC 60127-6, *Miniature fuses – Part 6: Fuse-holders for miniature fuse-links*

IEC 60127-7, *Miniature fuses – Part 7: Miniature fuse-links for special applications*

IEC 60127-8, (Free for further documents)

IEC 60127-9, (Free for further documents)

IEC 60127-10, *Miniature fuses – Part 10: User guide for miniature fuses*

MINIATURE FUSES –

Part 7: Miniature fuse-links for special applications

1 Scope

This part of IEC 60127 covers requirements for miniature fuse-links for special applications.

This part of IEC 60127 is applicable to fuse-links with a rated voltage not exceeding 1 000 V, a rated current not exceeding 20 A and a rated breaking capacity not exceeding 50 kA.

It does not apply to fuses completely covered by the subsequent parts of IEC 60269-1.

It does not apply to miniature fuse-links for appliances intended to be used under special conditions, such as in corrosive or explosive atmospheres.

This part of IEC 60127 applies in addition to the requirements of IEC 60127-1.

Miniature fuse-links for special applications are not intended to be replaced by the end-user of an electrical / electronic appliance.

The object of this part of IEC 60127 is to establish uniform test methods for miniature fuse-links for special applications, so as to allow verification of the values (for example melting time and breaking capacity values) specified by the manufacturer.

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 60068-2-21:2006, *Environmental testing – Part 2-21: Tests – Test U: Robustness of terminations and integral mounting devices*

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 60127-4:2005, *Miniature fuses – Part 4: Universal modular fuse-links (UMF) – Through-hole and surface mount types*
IEC 60127-4:2005/AMD1:2008
IEC 60127-4:2005/AMD2:2012

IEC 60127-6:2014, *Miniature fuses – Part 6: Fuse-holders for miniature fuse-links*

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*
IEC 60695-2-13:2010/AMD1:2014

IEC 60695-4:2012, *Fire hazard testing – Part 4: Terminology concerning fire tests for electrotechnical products*

IEC 61249-2-7:2002, *Materials for printed boards and other interconnecting structures – Part 2-7: Reinforced base materials clad and unclad – Epoxide woven E-glass laminated sheet of defined flammability (vertical burning test), copper-clad*

ISO 3:1973, *Preferred numbers – Series of preferred numbers*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in Clause 3 of IEC 60127-1:2006, except 3.5, as well as the following apply.

3.1
miniature fuse-link for special applications
enclosed fuse-link which is not covered in IEC 60127-2, IEC 60127-3 or IEC 60127-4 and of rated breaking capacity not exceeding 50 kA, with a width and height not exceeding 12 mm and a length not exceeding 50 mm

Note 1 to entry: Special precautions may be necessary to ensure that the fuse-links will be replaced by a fuse-link with the same technical parameters.

Note 2 to entry: For fuse-links having a metallic cap at each end, any member of terminals or terminations other than the metallic cap such as wire terminations, pins and bolt-in contacts may not be included in the total length of 50 mm and the width and height of 12 mm.

3.2
t_1 to t_8
limit values for time/current characteristic

3.3
I_{70}
test current for testing at elevated temperature of 70 °C

Note 1 to entry: Preferred values are 0,8 I_N or 1,0 I_N or 1,1 I_N.

3.4
I_{test} (A)
test current for endurance testing according to method A

Note 1 to entry: Preferred values are 1,0 I_N or 1,05 I_N or 1,2 I_N.

3.5
I_{test} (B)
test current for endurance testing according to method B

Note 1 to entry: Preferred values are 0,8 I_N or 1,0 I_N.

3.6
I_{OVL} (A)
test current for measuring the maximum sustained dissipation according to method A

Note 1 to entry: Preferred values are 1,25 I_N or 1,35 I_N or 1,5 I_N.

3.7
I_{OVL} (B)
test current for measuring the maximum sustained dissipation according to method B

Note 1 to entry: Preferred values are 1,0 I_N or 1,25 I_N.

4 General requirements

Clause 4 of IEC 60127-1:2006 applies.

5 Standard ratings

Clause 5 of IEC 60127-1:2006 does not apply.

Replacement:

The following ratings shall be agreed upon between the testing house and the manufacturer:

– rated voltage;
– rated current (see standard sheet 1 for preferred ratings);
– rated breaking capacity (a.c. and/or d.c.);
– time/current characteristic (at least at 2,0 I_N or 2,1 I_N and 10 I_N).

The following may be agreed upon on an optional basis:

– test at elevated temperature;
– time/current characteristic (additionally at 2,75 I_N and 4 I_N).

Any additional specified values are given in standard sheet 1.

6 Marking

Clause 6 of IEC 60127-1:2006 applies except as follows.

6.1

Replacement:

d) Not applicable.

NOTE A symbol denoting the time/current characteristic cannot be stated, because this part of IEC 60127 does not specify any values for this parameter.

Addition:

e) Type designation.
f) Rated breaking capacity in amperes (A) or in kilo amperes (kA).

6.2

Deletion of NOTE 2.

6.3

Addition after first paragraph:

Furthermore the rated breaking capacity in amperes (A) or in kilo amperes (kA) shall be marked on the package label.

6.4

Addition of heading title and replacement of text:

6.4 Colour coding for miniature fuse-links for special applications

Marking of fuse-links by means of colour bands according to IEC 60127-1:2006, Annex A, is not permitted. It is, however, possible to use colour markings that clearly differ from this colour band system. In this case, the manufacturer shall provide the relevant information, for example colour key.

Additional subclause:

6.101 Where marking is impracticable due to space limitations, the relevant information should appear on the smallest package and in the manufacturer's technical literature.

7 General notes on tests

Clause 7 of IEC 60127-1:2006 applies except as follows.

7.2 Type tests

7.2.1

Replacement:

For testing the individual current ratings of fuses with a.c. or d.c. breaking capacity, the number of fuse-links required is 51, of which 12 are kept as spares. For fuse-links with wire terminations six extra samples (E1 to E6) have to be taken by random and not sorted according to voltage drop. If necessary, these samples can be used as additional spares after performing the tests according to 8.3.

The testing schedule is shown in Table 2.

For testing the individual current ratings of fuses with a.c. and d.c. breaking capacity, the number of fuse-links required is 63, of which 9 are kept as spares. For fuse-links with wire terminations six extra samples (E1 to E6) have to be taken by random and not sorted according to voltage drop. If necessary, these samples can be used as additional spares after performing the tests according to 8.3.The testing schedule is shown in Table 3.

For testing the maximum ampere rating of a homogenous series with a.c. or d.c. breaking capacity the number of fuse-links required is 51, of which 22 are kept as spares. For fuse-links with wire terminations six extra samples (E1 to E6) have to be taken by random and not sorted according to voltage drop. If necessary, these samples can be used as additional spares after performing the tests according to 8.3.

The testing schedule is shown in Table 4.

For testing the maximum ampere rating of a homogenous series with a.c. and d.c. breaking capacity the number of fuse-links required is 66, of which 32 are kept as spares. For fuse-links with wire terminations six extra samples (E1 to E6) have to be taken by random and not sorted according to voltage drop. If necessary, these samples can be used as additional spares after performing the tests according to 8.3.