

Miniature fuses —

Part 1: Definitions for miniature fuses and general requirements for miniature fuse-links

ICS 29.120.50

National foreword

This British Standard is the UK implementation of EN 60127-1:2006+A2:2015. It is identical to IEC 60127-1:2006, incorporating amendment 2:2015. It supersedes BS EN 60127-1:2006+A1:2011, which will be withdrawn on 25 March 2018.

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 2 is indicated by **A2** ~~A2~~.

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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Miniature fuses
Part 1: Definitions for miniature fuses and
general requirements for miniature fuse-links
(IEC 60127-1:2006)

Coupe-circuit miniatures
Partie 1: Définitions pour coupe-circuit
miniatures et prescriptions générales pour
éléments de remplacement miniatures
(CEI 60127-1:2006)

Geräteschutzsicherungen
Teil 1: Begriffe für
Geräteschutzsicherungen und
allgemeine Anforderungen an
G-Sicherungseinsätze
(IEC 60127-1:2006)

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CENELEC

European Committee for Electrotechnical Standardization
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Europäisches Komitee für Elektrotechnische Normung

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Foreword

The text of document 32C/387/FDIS, future edition 2 of IEC 60127-1, prepared by SC 32C, Miniature fuses, of IEC TC 32, Fuses, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 60127-1 on 2006-07-01.

This European Standard supersedes EN 60127-1:1991 + A1:1999 + A2:2003.

The major technical changes concern Subclause 9.2.3 where the nature of the current source has been clarified; in addition, IEC 60038: *IEC standard voltages*, has been added to the list of normative references.

The following dates were fixed:

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Endorsement notice

The text of the International Standard IEC 60127-1:2006 was approved by CENELEC as a European Standard without any modification.

Foreword to amendment A1

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Foreword to amendment A2

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The text of the International Standard IEC 60127-1:2006/A2:2015 was approved by CENELEC as a European Standard without any modification.

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MINIATURE FUSES –

Part 1: Definitions for miniature fuses and general requirements for miniature fuse-links

1 Scope and object

This part of IEC 60127 covers the general requirements and tests applicable to all types of miniature fuse-links (e.g. cartridge fuse-links, sub-miniature fuse-links and universal modular fuse-links) for the protection of electric appliances, electronic equipment and component parts thereof normally intended to be used indoors.

^{A2} This standard does not apply to fuses intended for the protection of low-voltage electrical installations. These are covered by IEC 60269, *Low Voltage Fuses*. ^{A2}

Specific details covering each major subdivision are given in subsequent parts.

This standard does not apply to fuses for appliances intended to be used under special conditions, such as in a corrosive or explosive atmosphere.

The object of this standard is

- a) to establish uniform requirements for miniature fuses so as to protect appliances or parts of appliances in the most suitable way,
- b) to define the performance of the fuses, so as to give guidance to designers of electrical appliances and electronic equipment and to ensure replacement of fuse-links by those of similar dimensions and characteristics,
- c) to define methods of testing,
- d) to define maximum sustained dissipation of fuse-links to ensure good compatibility of stated power acceptance when used with fuse-holders according to this standard (see IEC 60127-6).

2 Normative references

The following referenced documents are indispensable for the application 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 60038, *IEC standard voltages*

IEC 60127-6:1994, *Miniature fuses – Part 6: Fuse-holders for miniature fuse-links*
Amendment 1 (1996)
Amendment 2 (2003)

3 Terms and definitions

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

3.1

fuse

device that, by the fusing of one or more of its specially designed and proportioned components, opens the circuit in which it is inserted by breaking the current when this exceeds a given value for a sufficient time

NOTE The fuse comprises all the parts that form the complete device.

3.2

miniature fuse

fuse in which the fuse-link is a miniature fuse-link

3.3

fuse-link

part of a fuse including the fuse-element(s) intended to be replaced after the fuse has operated

3.4

enclosed fuse-link

fuse-link in which the fuse-element is totally enclosed, so that during operation within its rating it cannot produce any harmful external effects, e.g. due to development of an arc, the release of gas or the ejection of flame or metallic particles

3.5

miniature fuse-link

enclosed fuse-link for the protection of electric appliances, electronic equipment and component parts thereof normally intended to be used indoors

3.5.1

cartridge fuse-link

enclosed miniature fuse-link of rated breaking capacity not exceeding 2 kA and which has at least one of its principle dimensions not exceeding 10 mm

NOTE Principle dimensions are length, width, height and diameter.

3.5.2

miniature fuse-link for special applications

enclosed miniature 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 and having a width and height not exceeding 12 mm and a length not exceeding 50 mm 

3.6

sub-miniature fuse-link

miniature fuse-link of which the case (body) has no principal dimension exceeding 10 mm

NOTE Principal dimensions are length, width, height and diameter.

3.7

universal modular fuse-link

miniature fuse-link primarily adapted for direct electrical connection to printed circuit boards or other conductive substrates, incorporating features designed to provide a degree of non-interchangeability where necessary

3.8

fuse-link contact

conductive part of a fuse-link designed to engage with a fuse-base contact or with a fuse-carrier contact

3.9

fuse-holder

combination of a fuse-base with its fuse-carrier

3.10

fuse-base

fuse-mount

fixed part of a fuse provided with contacts and terminals for connection to the system

3.11

fuse-base contact

fuse-mount contact

conductive part of a fuse-base, connected to a terminal designed to engage with a fuse-carrier contact or with a fuse-link contact

3.12

fuse-carrier

movable part of a fuse designed to carry a fuse-link

3.13

fuse-carrier contact

conductive part of a fuse-carrier connected to a fuse-link contact and designed to engage with a fuse-base contact

3.14

fuse-element

part of the fuse-link designed to melt when the fuse operates

3.15

homogeneous series (of fuse-links)

series of fuse-links, deviating from each other only in such characteristics that, for a given test, the testing of one or a reduced number of particular fuse-links of the series may be taken as representative of all the fuse-links of the series

NOTE Fuse-links are considered as forming a homogeneous series when the characteristics comply with the following:

- the bodies have the same dimensions, material and method of manufacture;
- the caps or other end closures of the body have the same dimensions, materials and method of attachment and sealing;
- the granular filler, if any, of the body is of the same material and completeness of filling. It should be of the same size or any variation of the grain size with current rating should be monotonous;
- the fuse-elements are of the same material with the same principles of design and construction; any changes of fuse-element dimensions with current rating should be monotonous;
- the rated voltage is the same;
- for low-breaking capacity fuse-links it is only necessary to test the highest rated breaking capacity in a homogeneous series.

3.16 rating

general term employed to designate the characteristic values that together define the working conditions upon which the tests are based and for which the fuse is designed

Examples of rated values usually stated for fuses:

- voltage (U_N);
- current (I_N);
- breaking capacity.

3.17 time/current characteristics (of a fuse-link)

- a) For a.c.: curve giving, under stated conditions of operation, the value of time expressed as virtual time as a function of the prospective symmetrical current, expressed as the r.m.s. value
- b) For d.c.: curve giving, under stated conditions of operation, the value of time expressed as actual time as a function of the d.c. prospective current

NOTE Time/current characteristics usually stated for a fuse-link relate to the pre-arcing time and the operating time.

3.18 conventional non-fusing current

value of current specified as that which the fuse-link is capable of carrying for a specified time (conventional time) without melting

3.19 prospective current (of a circuit and with respect to a fuse)

current that would flow in a circuit, if a fuse situated therein were replaced by a link of negligible impedance

3.20 pre-arcing time (melting time)

interval of time between the beginning of a current large enough to cause a break in the fuse-element and the instant when an arc is initiated

3.21 arcing time

interval of time between the instant of the initiation of the arc and the instant of final arc extinction

3.22 operating time (total clearing time)

sum of the pre-arcing time and the arcing time

3.23 virtual time

value of I^2t divided by the value of the square of the value of the prospective current

NOTE The values of the virtual times, usually stated for a fuse-link, are the values of the pre-arcing time and of the operating time.