

INTERNATIONAL STANDARD

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**Low-voltage fuses –
Part 4: Supplementary requirements for fuse-links for the protection of
semiconductor devices**

**Fusibles basse tension –
Partie 4: Exigences supplémentaires concernant les éléments de remplacement
utilisés pour la protection des dispositifs à semiconducteurs**



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INTERNATIONAL ELECTROTECHNICAL COMMISSION

LOW-VOLTAGE FUSES –

**Part 4: Supplementary requirements for fuse-links
for the protection of semiconductor devices**

FOREWORD

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This consolidated version of IEC 60269-4 consists of the fifth edition (2009) [documents 32B/535/FDIS and 32B/541/RVD] and its amendment 1 (2012) [documents 32B/579/CDV and 32B/586A/RVC]. It bears the edition number 5.1.

The technical content is therefore identical to the base edition and its amendment and has been prepared for user convenience. A vertical line in the margin shows where the base publication has been modified by amendment 1. Additions and deletions are displayed in red, with deletions being struck through.

International Standard IEC 60269-4 has been prepared by subcommittee 32B: Low-voltage fuses, of IEC technical committee 32: Fuses.

This fifth edition cancels and replaces the fourth edition published in 2006. It constitutes a technical revision. The significant technical changes to the fourth edition are:

- the introduction of voltage source inverter fuse-links, including test requirements;
- coverage of the tests on operating characteristics for a.c. by the breaking capacity tests;
- the updating of examples of standardised fuse-links for the protection of semiconductor devices.

This part is to be used in conjunction with IEC 60269-1:2006, *Low-voltage fuses – Part 1: General requirements*.

This Part 4 supplements or modifies the corresponding clauses or subclauses of Part 1.

Where no change is necessary, this Part 4 indicates that the relevant clause or subclause applies.

Tables and figures which are additional to those in Part 1 are numbered starting from 101.

Additional annexes are lettered AA, BB, etc.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts of the IEC 60269 series, under the general title: *Low-voltage fuses*, can be found on the IEC website.

The committee has decided that the contents of the base publication and its amendments will remain unchanged until the stability 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

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LOW-VOLTAGE FUSES –

Part 4: Supplementary requirements for fuse-links for the protection of semiconductor devices

1 General

IEC 60269-1 applies with the following supplementary requirements.

Fuse-links for the protection of semiconductor devices shall comply with all requirements of IEC 60269-1, if not otherwise indicated hereinafter, and shall also comply with the supplementary requirements laid down below.

1.1 Scope and object

These supplementary requirements apply to fuse-links for application in equipment containing semiconductor devices for circuits of nominal voltages up to 1 000 V a.c. or 1 500 V d.c. and also, in so far as they are applicable, for circuits of higher nominal voltages.

NOTE 1 Such fuse-links are commonly referred to as “semiconductor fuse-links”.

NOTE 2 In most cases, a part of the associated equipment serves the purpose of a fuse-base. Owing to the great variety of equipment, no general rules can be given; the suitability of the associated equipment to serve as a fuse-base should be subject to agreement between the manufacturer and the user. However, if separate fuse-bases or fuse-holders are used, they should comply with the appropriate requirements of IEC 60269-1.

NOTE 3 IEC 60269-6 (Low-voltage fuses – Part 6: Supplementary requirements for fuse-links for the protection of solar photovoltaic energy systems) is dedicated to the protection of solar photovoltaic energy systems.

The object of these supplementary requirements is to establish the characteristics of semiconductor fuse-links in such a way that they can be replaced by other fuse-links having the same characteristics, provided that their dimensions are identical. For this purpose, this standard refers in particular to

- a) the following characteristics of fuses:
 - 1) their rated values;
 - 2) their temperature rises in normal service;
 - 3) their power dissipation;
 - 4) their time-current characteristics;
 - 5) their breaking capacity;
 - 6) their cut-off current characteristics and their I^2t characteristics;
 - 7) their arc voltage characteristics;
- b) type tests for verification of the characteristics of fuses;
- c) the markings on fuses;
- d) availability and presentation of technical data (see Annex B).

1.2 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 60269-1:2006, *Low-voltage fuses – General requirements*

IEC 60269-2:2006, *Low-voltage fuses – Supplementary requirements for fuses for use by authorized persons (fuses mainly for industrial application) – Examples of standardized systems of fuses A to J*

IEC 60269-3:2006, *Low-voltage fuses – Supplementary requirements for fuses for use by unskilled persons (fuses mainly for household and similar applications) – Examples of standardized systems of fuses A to F*

IEC 60417, *Graphical symbols for use on equipment*

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

2 Terms and definitions

IEC 60269-1 applies with the following supplementary definitions.

2.2 General terms

2.2.101

semiconductor device

device whose essential characteristics are due to the flow of charge carriers within a semiconductor

[IEV 521-04-01]

2.2.102

semiconductor fuse-link

current-limiting fuse-link capable of breaking, under specific conditions, any current value within the breaking range (see 7.4)

2.2.103

signalling device

device forming part of the fuse and signalling the fuse operation to a remote place

NOTE A signalling device consists of a striker and an auxiliary switch. Electronic devices may also be used.

2.2.104

voltage source inverter

VSI

a voltage stiff inverter

[IEV 551-12-11]

NOTE Also referred to as a voltage stiff inverter i.e. an inverter that supplies current without any practical change in its output voltage.