
Low-voltage fuses - Part 3-1: Supplementary requirements for fuses for use by unskilled persons (fuses mainly for household and similar applications) - Sections I to IV (IEC 60269-3-1:1994 + A1:1995 + A2:2001, modified)

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST HD 630.3.1 S3:2003](https://standards.iteh.ai/catalog/standards/sist/542a5cfe-521c-44d0-a7e2-c9f89591af29/sist-hd-630-3-1-s3-2003)

<https://standards.iteh.ai/catalog/standards/sist/542a5cfe-521c-44d0-a7e2-c9f89591af29/sist-hd-630-3-1-s3-2003>

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST HD 630.3.1 S3:2003

<https://standards.iteh.ai/catalog/standards/sist/542a5cfe-521c-44d0-a7e2-c9f89591af29/sist-hd-630-3-1-s3-2003>

English version

Low-voltage fuses
Part 3-1: Supplementary requirements for fuses
for use by unskilled persons
(fuses mainly for household and similar applications) –
Sections I to IV
 (IEC 60269-3-1:1994 + A1:1995 + A2:2001, modified)

Fusibles basse tension
 Partie 3-1: Règles supplémentaires
 pour les fusibles destinés à être utilisés
 par des personnes non qualifiées
 (fusibles pour usages essentiellement
 domestiques et analogues) –
 Sections I à IV
 (CEI 60269-3-1:1994 + A1:1995 +
 A2:2001, modifiée)

Niederspannungssicherungen (D-System)
 Teil 3-1: Zusätzliche Anforderungen an
 Sicherungen zum Gebrauch durch Laien
 (Sicherungen überwiegend für
 Hausinstallationen und ähnliche
 Anwendungen) –
 Hauptabschnitte I bis IV
 (IEC 60269-3-1:1994 + A1:1995 +
 A2:2001, modifiziert)

This Harmonization Document was approved by CENELEC on 2002-02-01. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for implementation of this Harmonization Document on a national level.

Up-to-date lists and bibliographical references concerning such national implementation may be obtained on application to the Central Secretariat or to any CENELEC member.

This Harmonization Document exists in three official versions (English, French, German).

CENELEC members are the national electrotechnical committees of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

CENELEC

European Committee for Electrotechnical Standardization
 Comité Européen de Normalisation Electrotechnique
 Europäisches Komitee für Elektrotechnische Normung

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

Foreword

The text of the International Standard IEC 60269-3-1:1994 and its amendments 1:1995 and 2:2001, prepared by SC 32B, Low-voltage fuses, of IEC TC 32, Fuses, together with the common modifications prepared by the CENELEC BTTF 56-2, Low-voltage fuses, was submitted to the Unique Acceptance Procedure and was approved by CENELEC as HD 630.3.1 S3 on 2002-02-01.

The following dates were fixed:

- latest date by which the existence of the HD has to be announced at national level (doa) 2002-08-01
- latest date by which the HD has to be implemented at national level by publication of a harmonized national standard or by endorsement (dop) 2003-02-01
- latest date by which the national standards conflicting with the HD have to be withdrawn (dow) 2005-02-01

This Part 3.1 of HD 630 is to be used in conjunction with EN 60269-1:1998 and EN 60269-3:1995.

Annexes designated "normative" are part of the body of the standard.

Annexes designated "informative" are given for information only.

In this standard, annex ZA is normative and annex A is informative.

Annex ZA has been added by CENELEC.

SIST HD 630.3.1 S3:2003

<https://standards.iteh.ai/catalog/standards/sist/542a5cfe-521c-44d0-a7e2-c9f89591af29/sist-hd-630-3-1-s3-2003>

Endorsement notice

The text of the International Standard IEC 60269-3-1:1994 + A1:1995 + A2:2001 was approved by CENELEC as a Harmonization Document with agreed common modifications as given below.

COMMON MODIFICATIONS

1 General

Replace note 2 by:

NOTE 2 The following fuse systems are standardized systems in respect to their safety aspects. The National Committees shall select at least one complete section of this standard for their standards. Colour codes are not specified for each fuse-system. Where colour codes are indicated, they apply only to that particular fuse-system.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST HD 630.3.1 S3:2003](https://standards.iteh.ai/catalog/standards/sist/542a5cfe-521c-44d0-a7e2-c9f89591af29/sist-hd-630-3-1-s3-2003)

<https://standards.iteh.ai/catalog/standards/sist/542a5cfe-521c-44d0-a7e2-c9f89591af29/sist-hd-630-3-1-s3-2003>

Annex ZA (normative)**Normative references to international publications
with their corresponding European publications**

This Harmonization Document incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this Harmonization Document only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

NOTE When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60529	1989	Degrees of protection provided by enclosures (IP Code)	EN 60529	1991
IEC 60664	series	Insulation coordination for equipment within low-voltage systems	HD 625	series
IEC 60898 (mod)	1987	Circuit-breakers for overcurrent protection for household and similar installations	EN 60898 ¹⁾ + corr. October + A11 + A12 + A13 + A14 + A15 + A16 + A17 + A18 + A19	1991 1991 1994 1995 1995 1995 1995 1996 1998 1998 2000
IEC 60999-1 (mod)	1990	Connecting devices - Safety requirements for screw-type and screwless-type clamping units for electrical copper conductors -- Part 1: General requirements and particular requirements for conductors from 0,5 mm ² up to 35 mm ² (included)	EN 60999-1 + corr. March	1993 ²⁾ 1997
ISO 228-1	1994	Pipe threads where pressure-tight joints are not made on the threads -- Part 1: Dimensions, tolerances and designation		
ISO 228-2	1987	Pipe threads where pressure-tight joints are not made on the threads -- Part 2: Verification by means of limit gauges		
ISO 965-1	1998	ISO general-purpose metric screw threads - Tolerances -- Part 1: Principles and basic data		

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST HD 630.3.1 S3:2003](https://standards.iteh.ai/catalog/standards/sist/542a5cfe-521c-44d0-a7e2-c9f89591af29/sist-hd-630-3-1-s3-2003)

<https://standards.iteh.ai/catalog/standards/sist/542a5cfe-521c-44d0-a7e2-c9f89591af29/sist-hd-630-3-1-s3-2003>

¹⁾ EN 60898 includes corrigendum May 1988 + A2:1990 + A3:1990 + corrigendum August 1990 to IEC 60898.

²⁾ EN 60999-1 is superseded by EN 60999-1:2000 which is based on IEC 60999-1:1999.

NORME
INTERNATIONALE
INTERNATIONAL
STANDARD

CEI
IEC
269-3-1

Première édition
First edition
1994-08

Fusibles basse tension –

Partie 3-1:

Règles supplémentaires pour les fusibles destinés
à être utilisés par des personnes non qualifiées
(fusibles pour usages essentiellement domestiques
et analogues) –

Sections I à IV

SIST HD 630.3.1 S3:2003

<https://standards.iteh.ai/catalog/standards/sist/542a5cf5-521c-44d0-a7e2-c9f89591af29/sist-hd-630-3-1-s3-2003>

Low-voltage fuses –

Part 3-1:

Supplementary requirements for fuses for use by
unskilled persons (fuses mainly for household and
similar applications) –

Sections I to IV

© CEI 1994 Droits de reproduction réservés — Copyright — all rights reserved

Aucune partie de cette publication ne peut être reproduite ni
utilisée sous quelque forme que ce soit et par aucun pro-
cédé, électronique ou mécanique, y compris la photocopie et
les microfilms, sans l'accord écrit de l'éditeur

No part of this publication may be reproduced or utilized in
any form or by any means, electronic or mechanical,
including photocopying and microfilm, without permission
in writing from the publisher.

Bureau Central de la Commission Electrotechnique Internationale 3, rue de Varembe Genève, Suisse



Commission Electrotechnique Internationale
International Electrotechnical Commission
Международная Электротехническая Комиссия

CODE PRIX
PRICE CODE XD

Pour prix, voir catalogue en vigueur
For price, see current catalogue

CONTENTS

	Page
FOREWORD	15
EXPLANATORY NOTE	19
Clause	
1 General	19
1.0 Normative references	21
SECTION I – D-TYPE FUSES	
1.1 Scope	23
5 Characteristics of fuses	23
5.2 Rated voltage	23
5.3.1 Rated current of the fuse-link	23
5.3.2 Rated current of the fuse-holder	23
5.5 Rated power dissipation of a fuse-link and rated power acceptance of a fuse-holder	23
5.6 Limits of time-current characteristics	23
5.6.1 Time-current characteristics, time-current zones and overload curves	25
5.6.2 Conventional times and currents	25
5.6.3 Gates	27
5.7 Breaking range and breaking capacity	27
5.7.2 Rated breaking capacity	27
6 Markings	27
7 Standard conditions for construction	27
7.1 Mechanical design	27
7.1.2 Connections including terminals	27
7.1.3 Fuse-contacts	29
7.1.4 Non-interchangeability	29
7.1.5 Construction of a fuse-base	29
7.1.6 Construction of a fuse-carrier	29
7.1.7 Construction of a fuse-link	29
7.1.8 Construction of a gauge-piece	31
7.2 Insulating properties	33
7.3 Temperature rise, power dissipation of the fuse-link and power acceptance of the fuse-holder	33
7.7 I^2t characteristics	33
7.7.1 Pre-arcing I^2t values	33
7.7.2 Operating I^2t values	33
7.8 Overcurrent discrimination of "gG" fuse-links	35
7.9 Protection against electric shock	35
8 Tests	35
8.1.5.1 Complete tests	35
8.1.5.2 Testing of fuse-links of a homogeneous series	37
8.2 Verification of insulating properties	37
8.2.1 Arrangement of the fuse-holder	37
8.2.6 Creepage distances, clearances and distances through sealing compound	37
8.2.6.1 Test method	37
8.2.6.2 Acceptability of test results	37

Clause		Page
8.3	Verification of temperature rise and power dissipation	37
8.3.1	Arrangement of the fuse	37
8.3.3	Measurement of the power dissipation of the fuse-link.....	39
8.3.4.1	Temperature rise of the fuse-holder	39
8.3.5	Acceptability of test results	39
8.4.3.1	Verification of conventional non-fusing and fusing current	39
8.4.3.2	Verification of rated current of fuse-links	39
8.4.3.5	Conventional cable overload protection	41
8.4.3.6	Operation of indicating devices and strikers, if any	41
8.5.2	Characteristics of the test circuit	41
8.5.8	Acceptability of test results	41
8.7.4	Verification of overcurrent discrimination	41
8.9	Verification of resistance to heat	43
8.9.1	Fuse-base	43
8.9.1.1	Test arrangement	43
8.9.1.2	Test method	45
8.9.1.3	Acceptability of test results	45
8.9.2	Fuse-carrier	45
8.9.2.1	Test arrangement	45
8.9.2.2	Test method	47
8.9.2.3	Acceptability of test results	47
8.10	Verification of non-deterioration of contacts	47
8.10.1	Arrangement of the fuse	47
8.10.2	Test method	47
8.10.3	Acceptability of test results	49
8.11	Mechanical and miscellaneous tests	51
8.11.1	Mechanical strength	51
8.11.1.1	Mechanical strength of the gauge-piece	51
8.11.1.2	Mechanical strength of the fuse-carrier	51
8.11.1.3	Mechanical strength of the fuse-link	51
8.11.1.4	Mechanical strength of the fuse	53
8.11.2.4	Resistance to storage at elevated temperature	53
8.11.2.4.1	Test arrangement	53
8.11.2.4.2	Test method	53
8.11.2.4.3	Acceptability of test results	55
Figures (1 to 9)		56

SECTION IIA – CYLINDRICAL FUSES TYPE A

1.1	Scope	79
2	Definitions	79
2.1.12	Screw-type terminal	79
2.1.13	Pillar terminal	79
5	Characteristics of fuses	79
5.2	Rated voltage	79
5.3.1	Rated current of the fuse-link	79
5.3.2	Rated current of the fuse-holder	79
5.5	Rated power dissipation of a fuse-link and rated power acceptance of a fuse-holder	79
5.6.2	Conventional times and currents	81
5.6.3	Gates	81

Clause		Page
7	Standard conditions for construction	81
7.1	Mechanical design	81
7.1.2	Connections including terminals	83
7.2	Insulating properties	85
7.7	I^2t characteristics	85
7.7.1	Pre-arcing I^2t values	87
7.7.2	Total I^2t values	87
7.8	Overcurrent discrimination of "gG" fuse-links	87
7.9	Protection against electric shock	87
8	Tests	87
8.1.5.1	Complete tests	87
8.1.6	Testing of fuse-holders	89
8.3.1	Arrangement of the fuse	91
8.3.3	Measurement of the power dissipation of the fuse-link	91
8.3.4.1	Temperature rise of the fuse-holder	91
8.4	Verification of operation	91
8.4.1	Arrangement of the fuse	91
8.4.3.6	Operation of indicating devices and strikers, if any	93
8.5	Verification of the breaking capacity	93
8.5.1	Arrangement of the fuse	93
8.5.8	Acceptability of test results	93
8.7.4	Verification of overcurrent discrimination	95
8.8	Verification of the degree of protection of enclosures	95
8.8.1	Verification of protection against electric shock	95
8.9	Verification of resistance to heat	95
8.10	Verification of non-deterioration of contacts	95
8.10.1	Arrangement of the fuse	97
8.10.2	Test method	97
8.10.3	Acceptability of test results	97
8.11.1.1	Mechanical strength of the fuse-holder	97
8.11.1.1.1	Verification of resistance to shock	97
8.11.1.1.1.1	Test apparatus	99
8.11.1.1.1.2	Test procedure	101
8.11.1.1.2	Verification of the constructional requirements	103
8.12	Verification of the reliability of terminals	104
	Figures (10 to 16)	104

SECTION IIB – CYLINDRICAL FUSES TYPE B

1.1	Scope	113
5	Characteristics of fuses	113
5.3	Rated current	113
5.3.1	Rated current of the fuse-link	113
5.3.2	Rated current of the fuse-holder	113
5.5	Rated power dissipation of a fuse-link and rated power acceptance of a fuse-holder	113
5.6	Limits of time-current characteristics	113
5.6.1	Time-current characteristics, time-current curves and overload curves	113
5.6.2	Conventional times and currents	115
5.7	Breaking range and breaking capacity	115
5.7.2	Rated breaking capacity	115

Clause		Page
7	Standard conditions for construction	115
7.1	Mechanical design	115
7.1.2	Connections including terminals	115
7.9	Protection against electric shock	115
8	Tests	115
8.1	General	115
8.1.4	Arrangement of the fuse	115
8.3	Verification of temperature rise and power dissipation	115
8.3.1	Arrangements of the fuse	115
8.3.3	Measurement of the power dissipation of the fuse-link.....	115
8.4	Verification of operation	117
8.4.1	Arrangement of fuse	117
8.5	Verification of breaking capacity	117
8.5.1	Arrangement of the fuse	117
8.5.8	Acceptability of test results	117
8.10	Verification of non-deterioration of contacts	117
8.10.1	Arrangement of the fuse	117
8.10.2	Test method.....	117
8.10.3	Acceptability of test results	119
Figures (17 to 22).....		120

SECTION IIC – CYLINDRICAL FUSES TYPE C
(standards.iteh.ai)

1.1	Scope	131
5	Characteristics of fuses	131
5.3.1	Rated current of the fuse-link.....	131
5.3.2	Rated current of the fuse-holder.....	131
5.5	Rated power dissipation of a fuse-link and rated power acceptance of a fuse-holder	133
5.6	Limits of time-current characteristics	133
5.6.1	Time-current characteristics, time-current zones and overload curves	133
5.6.2	Conventional times and currents	133
5.6.3	Gates	135
7	Standard conditions for construction	135
7.1	Mechanical design	135
7.1.2	Connections including terminals	135
7.2	Insulating properties	137
7.3	Temperature rise, power dissipation of the fuse-link and power acceptance of the fuse-holder	137
7.7	I^2t characteristics	137
7.7.1	Minimum pre-arcing I^2t values at 0,01 s	137
7.7.2	Maximum operating I^2t values at 0,01 s	137
8	Tests	137
8.1.6	Testing of the fuse-holder	137
8.3	Verification of temperature rise and power dissipation	139
8.3.1	Arrangement of the fuse	139
8.3.3	Measurement of the power dissipation of the fuse-link.....	139
8.3.4.1	Temperature rise of the fuse-holder	139
8.4	Verification of operation	141
8.4.1	Arrangement of the fuse	141

Clause		Page
8.5	Verification of the breaking capacity	141
8.5.1	Arrangement of the fuse	141
8.5.8	Acceptability of test results	141
8.7.4	Verification of discrimination	143
8.9	Verification of resistance to heat	143
8.9.1	Test in heating cabinet	143
8.9.2	Ball pressure test	145
8.10	Verification of non-deterioration of contacts	145
8.10.1	Arrangement of the fuse	145
8.10.2	Test method	145
8.10.3	Acceptability of test results	145
8.11	Mechanical and miscellaneous tests	145
8.11.1.6	Mechanical strength of the fuse-holder	145
8.11.1.6.1	Impact test	149
8.11.1.6.2	Construction of the fuse-carrier	151
8.11.1.6.3	Mechanical strength of the screw-type fuse-holder	152
	Figures (23 to 28)	152

SECTION III – PIN-TYPE FUSES

1.1	Scope	159
2	Definitions	159
2.3	Characteristic quantities	159
2.3.25	Equivalent section of a fuse-base	159
2.3.26	Size of the fuse-base	159
5	Characteristics of fuses	159
5.5	Rated power dissipation of the fuse-link	159
5.6	Limits of time-current characteristics	159
5.6.2	Conventional times and currents	161
5.6.3	Gates	161
6	Markings	161
6.1	Markings of fuse-holders	161
6.2	Markings of fuse-links	161
6.4	Markings of the gauge-pieces	163
7	Standard conditions for construction	163
7.1	Mechanical design	163
7.1.8	Construction of the gauge-piece	163
7.3	Temperature rise, power dissipation of the fuse-link and power acceptance of the fuse-holder	163
8	Tests	163
8.3	Verification of temperature rise and power dissipation	163
8.3.1	Arrangement of the fuse	163
8.3.3	Measurement of the power dissipation of the fuse-link	165
8.3.4	Test method	165
8.3.4.1	Temperature rise of the fuse-holder	167
8.10	Verification of non-deterioration of contacts	167
8.10.1	Arrangement of the fuse	167
8.10.2	Test method	169
8.10.3	Acceptability of test results	170
	Figures (29 to 32)	170

Clause		Page
SECTION IV – CYLINDRICAL FUSE-LINKS FOR USE IN PLUGS		
1.1	Scope	175
5	Characteristics of fuses	175
5.2	Rated voltage	175
5.3.1	Rated current of the fuse-link	175
5.5	Rated power dissipation of the fuse-link and rated power acceptance of a fuse-holder	175
5.6.1	Time-current characteristics, time-current zones and overload curves	175
5.6.2	Conventional times and currents	175
5.6.3	Gates	175
7	Standard conditions for construction	177
7.7	I^2t characteristics	177
7.7.1	Pre-arcing I^2t values	177
8	Tests	177
8.1.4	Arrangement of the fuse-link for tests	177
8.1.5	Testing of fuse-links	177
8.2.5	Acceptability of test results	181
8.3	Verification of temperature rise and power dissipation	181
8.3.1	Arrangement of the fuse	181
8.3.4	Test method	181
8.3.5	Acceptability of test results	181
8.4	Verification of operation	181
8.4.1	Arrangement of the fuse	181
8.4.3.1	Verification of conventional non-fusing and fusing current	181
8.4.3.2	Verification of rated current of "gG" fuse-links	181
8.5	Breaking capacity tests	183
8.5.1	Arrangement of the fuse	183
8.5.2	Characteristics of the test circuit	183
8.5.4	Calibration of the test circuit	185
8.5.8	Acceptability of test results	185
8.7	Verification of I^2t characteristics and overcurrent discrimination	185
8.10	Verification of non-deterioration of contacts	187
8.11.1	Mechanical strength	187
	Figures (33 to 36)	188

INTERNATIONAL ELECTROTECHNICAL COMMISSION

LOW-VOLTAGE FUSES -

Part 3-1:
Supplementary requirements for fuses for use by unskilled persons
(fuses mainly for household and similar applications) -

Sections I to IV

FOREWORD

- 1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the IEC is to promote international cooperation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, the IEC publishes International Standards. Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. The IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of the IEC on technical matters, prepared by technical committees on which all the National Committees having a special interest therein are represented, express, as nearly as possible, an international consensus of opinion on the subjects dealt with.
- 3) They have the form of recommendations for international use published in the form of standards, technical reports or guides and they are accepted by the National Committees in that sense.
- 4) In order to promote international unification, IEC National Committees undertake to apply IEC International Standards transparently to the maximum extent possible in their national and regional standards. Any divergence between the IEC Standard and the corresponding national or regional standard shall be clearly indicated in the latter.
- 5) The IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with one of its standards.

International Standard IEC 269-3-1 has been prepared by sub-committee 32B: Low-voltage fuses, of IEC technical committee 32: Fuses.

This edition cancels and replaces the first edition of IEC 269-3A published in 1978.

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

Six Months' Rule/ DIS	Reports on voting	Two Months' Procedure/ Amendment to DIS	Reports on voting
32B(CO)69	32B(CO)71	32B(CO)74 32B(CO)75 32B(CO)76 32B(CO)77 32B(CO)78 32B(CO)79 32B(CO)89	32B(CO)82 and 82A 32B(CO)83 and 83A 32B(CO)84 and 84A 32B(CO)85 and 85A 32B(CO)86 and 86A 32B(CO)87 and 87A 32B(CO)98
32B(CO)73 32B(CO)88 and 88A 32B(CO)91 32B(CO)92 32B(CO)93 32B(CO)96	32B(CO)81 32B(CO)97 32B(CO)99 32B(CO)100 32B(CO)101 32B(CO)104		

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

IEC 269 consists of the following parts, under the general title: *Low-voltage fuses*

- Part 1: 1986, *General requirements*
- Part 2: 1986, *Supplementary requirements for fuses for use by authorized persons (fuses mainly for industrial application)*
- Part 3: 1987, *Supplementary requirements for fuses for use by unskilled persons (fuses mainly for household and similar application)*
- Part 4: 1986, *Supplementary requirements for fuse-links for the protection of semi-conductor devices.*