SLOVENSKI STANDARD

SIST HD 630.2.1 S5:2003

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Low-voltage fuses - Part 2-1: Supplementary requirements for fuses for use by authorized persons (fuses mainly for industrial application) - Sections I to V: Examples of types of standardized fuses (IEC 60269-2-1:1998 + A1:1999, modified)

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HARMONIZATION DOCUMENT **HD 630.2.1 S5**

DOCUMENT D'HARMONISATION

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Supersedes HD 630.2.1 S4:2000

English version

Low-voltage fuses
Part 2-1: Supplementary requirements for fuses for use by authorized persons (fuses mainly for industrial application) Sections I to V: Examples of types of standardized fuses
(IEC 60269-2-1:1998 + A1:1999, modified)

Fusibles basse tension
Partie 2-1: Règles supplémentaires pour les fusibles destinés à être utilisés par des personnes habilitées (fusibles pour usages essentiellement industriels)
Sections I à V: Exemples de fusibles normalisés
(CEI 60269-2-1:1998 + A1:1999, modifiée)

Niederspannungssicherungen (NH-System)
Teil 2-1: Zusätzliche Anforderungen an Sicherungen zum Gebrauch durch Elektrofachkräfte bzw. elektrotechnisch unterwiesene Personen (Sicherungen überwiegend für den industriellen Gebrauch)
Hauptabschnitte I bis V: Beispiele von genormten Sicherungstypen
(IEC 60269-2-1:1998 + A1:1999, modifiziert)

This Harmonization Document was approved by CENELEC on 2002-05-01. 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 60269-2-1:1998 and its amendment 1:1999, 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 formal vote and was approved by CENELEC as HD 630.2.1 S5 on 2002-05-01.

This Harmonization Document supersedes HD 630.2.1 S4:2000.

The following dates were fixed:

- latest date by which the existence of the HD has to be announced at national level	(doa)	2002-11-01
- latest date by which the HD has to be implemented at national level by publication of a harmonized national standard or by endorsement	(dop)	2003-05-01
- latest date by which the national standards conflicting with the HD have to be withdrawn	(dow)	2005-05-01

This Harmonization Document is to be used in conjunction with EN 60269-1:1998 and EN 60269-2:1995.

Endorsement notice

The text of the International Standard IEC 60269-2-1:1998 + A1:1999 was approved by CENELEC as a Harmonization Document with agreed common modifications as given below.

COMMON MODIFICATIONS

1 General

Replace the note by:

NOTE The following fuse systems are standardized in respect to their safety aspects. The National Committees shall select at least one complete section of this standard for their standards.
The time current characteristics "gD" and "gN" are only relevant for Section V.

Section I – Fuses with fuse-links with blade contacts

1.1 Scope

Insert "see Figure 3(I)" *after* "replacement handle".

Add:

Additional requirements to fuses with fuse-links having gripping-lugs made of insulating material or metallic gripping-lugs fixed in insulating material are also defined in the following.

2 Definitions

Add to the definitions of EN 60269-1:

2.1.12
linked fuse-carrier
a fuse-carrier which is mechanically linked to the fuse-base and gives a defined insertion and withdrawal movement to the fuse-link

NOTE See also EN 60947.

2.1.13
gripping-lugs
the parts of a fuse-link which are engaged with the replacement handle or fuse-carrier. Gripping-lugs may be made of metal or insulating material. Metal gripping-lugs may be live or not live under service conditions

2.1.13.1
live gripping-lugs
metal gripping-lugs electrically connected to the blade contacts of the fuse-link. Metal gripping-lugs without electrical contact to the blade contacts are also deemed to be live in case of inadequate creepage distances and clearances according to this standard

2.1.13.2
isolated gripping-lugs
not-live gripping-lugs made of insulating material or metal. If they are made of metal the required creepage distances and clearances according to the relevant overvoltage category shall be met between the gripping-lugs and the blade contacts as well as between the gripping-lugs and the fuse-base contacts

5.2 Rated voltage

Add:

The rated voltage of fuse-bases according to Figure 2(I) is 690 V.

5.3.1 Rated current of the fuse-link

Add:

A rated current of 224 A is added to the values as given in 5.3.1 of EN 60269-1.

5.6.3 Gates

Add the following values for 224 A in Table III:

1	2	3	4	5
I_n for "gG" A	I_{min} (10 s)*** A	I_{max} (5 s)*** A	I_{min} (0,1 s) A	I_{max} (0,1 s) A
224	680	1 450	2 240	3 980

6.2 Markings of fuse-links

Add:

Fuse-links with isolated gripping-lugs shall be marked in a place easily visible from the front with the graphical symbol of a gripping-lug in a square.

NOTE See Figure 12(I) for detailed dimensions of the symbol.

7.1.2 Connections, including terminals

Replace Table D by the following table for sizes 00 to 2:

Table D — Minimum cross-sectional ranges of unprepared conductors

Size	Range of the rated currents of the fuse-links A	Cross-sectional area ranges mm²	
		Cu	Al
00	6 to 160	6 to 70	25 to 95
0*	6 to 160	6 to 70	25 to 95
1	80 to 250	25 to 120	35 to 150
2	125 to 400	50 to 240	70 to 300
* Not allowed for new installations except for fuse-links with strikers.			

7.1.3 Fuse-contacts

Replace the second sentence by:

If the surface plating of the blade contacts of a fuse-link is other than silver the test according to 8.10 has to be passed with dummies described in 8.10.1.

Add the following note:

NOTE If fuse-links are intended to be removed or inserted under load the construction of the fuse, in particular the fuse-contacts, should be suitable for this purpose.

Add the following subclause:

7.1.5 Construction of fuse-bases

The dynamic short-circuit withstand of the fuse shall - whenever needed - meet the cut-off currents as given in Table G.

Fuse-bases shall meet the temperature rise test according to 8.3 including all protective covers intended to be used.

7.1.7 Construction of a fuse-link

Add:

Electrically conductive parts of indicators shall not be ejected from the fuse-link during operation.

7.2 Insulating properties

Add:

The creepage distances and clearances of the fuses and fuse-accessories shall at minimum meet the requirements of IEC 60664-1 for overvoltage category III and pollution degree 3. The minimum clearances are also applicable to metal parts which are not permanently live but may be touched. They shall not be diminished during replacement of the fuse-link. The creepage distances between isolated metal gripping lugs and live parts are chosen according to the rated voltage divided by $\sqrt{3}$.

For insulation stressed only for a short time the creepage distances of isolated metal gripping lugs corresponding to two voltage steps lower may be used.

Insulating parts of the fuse-base supporting live parts have to pass the test at PTI 500 M according to IEC 60112 on five specimens.

7.7 I^2t characteristics

Add the following values for 224 A in Table VI:

I_n for "gG" A	I^2t_{min} 10^3 x (A^2s)	I^2t_{max} 10^3 x (A^2s)
224	200	520

7.9 Protection against electric shock

Add:

Operation of the fuse-links is considered safe when carried out by authorized persons, instructed in electrical matters, using replacement handles according to this standard or linked fuse-carriers. Insulating covers and/or phase separators may be used where applicable.

8.1.4 Arrangement of the fuse and dimensions

Add:

The requirements of 7.2 are verified on fuse-bases. The fuse-bases are connected to conductors having the minimum and maximum cross-sections of the range as given in Table D.

In case of isolated metal gripping-lugs the creepage distances and clearances of the fuse-link according to 7.2 are verified. The clearances are also verified on a fuse-link inserted into a model fuse-base according to Figure 11(I).

8.2.2 Points of application of the test voltage

Add:

e) between isolated metal gripping-lugs and the terminals of the test fuse-base.

8.2.3 Value of test voltage

Add:

The insulating properties of isolated gripping-lugs may optionally be verified by an impulse withstand voltage test. The relevant rated impulse withstand voltage is given in Table O with reference to the rated voltage of the fuse-link.

Table O — Rated impulse withstand voltage

Rated voltage V	Rated impulse withstand voltage kV
400	4
500	4
690	6

8.2.4 Test method

Add the following subclause:

8.2.4.3 Three impulses of both polarities and of the shape 1,2/50 according to IEC 60060-1 and at the rated withstand voltage level according to Table O are applied to the test object. The minimum period between the impulses shall be 1 s.

NOTE 1 If not otherwise specified the impedance of the impulse generator shall not exceed 500 Ω.

NOTE 2 See IEC 60060-1, IEC 60060-3 and IEC 60060-4 for detailed description of the test equipment.

8.2.5 Acceptability of test results

Add the following subclause:

8.2.5.3 No flash-over or puncture shall occur during the test. Partial discharges are ignored.

Fuse-links with metal gripping-lugs without electrical contact to the blade contacts which do not comply with the requirements of 7.2 are not considered as isolated in service. They need, however, to fulfil the requirements of 8.9.2 and 8.11.1.8.

Add the following subclause:

8.2.6 Resistance to tracking

The test of fuse-links and -bases is carried out according to IEC 60112 using test solution B. Five specimens shall be tested and shall pass at PTI 500 M. Ceramic isolators need not be tested.

8.3.1 Arrangement of the fuse

Add:

In case the test arrangement contains more than one fuse the test specimens are mounted in conventional service position on a wooden plate at a distance between center lines of 3 e_2 according to Figure 1(I).

Copper bars as used for 500 A to 1 250 A test currents are painted mat black.

8.3.2 Measurement of the temperature rise

Add:

Protective covers and fuse-carriers as provided by the manufacturer are mounted.

8.4.3.1 Verification of conventional non-fusing and fusing current

Add:

In case the non-fusing current test is also used for the verification of the time current characteristic a second test specimen shall be used for b).

8.5.5.1 Verification of the peak withstand current of a fuse-base

Add at the end of the first sentence:

... or if the minimum withdrawal forces according to 8.11 are exceeded.

8.5.8 Acceptability of test results

Add the following note:

NOTE The fuse or circuit breaker for protection of the source must not operate during this test.

8.7.4 Verification of overcurrent discrimination

Add the following values for 224 A in Table H:

I_n	Minimum pre-arcing I^2t		Maximum operating I^2t		Discrimination ratio
	Prospective I r.m.s.	I^2t	Prospective I r.m.s.	I^2t	
A	kA	A^2s	kA	A^2s	
224	5,900	139 000	10,200	412 000	1 : 1,6

8.11.2.3 Verification of resistance to rusting

Add the following subclauses:

8.11.2.3.1 The test shall be carried out according to EN ISO 6988 with cyclic moist atmosphere containing 0,2 % SO_2 (SFW 0,2 S); number of cycles: 1.

For reasons of test economy this test may be carried out on the test samples used for the non-deterioration test of contacts according to 8.10 after completion of the test.

8.11.2.3.2 The following test is an optional test to be agreed between manufacturer and customer. It considers severe environmental conditions.

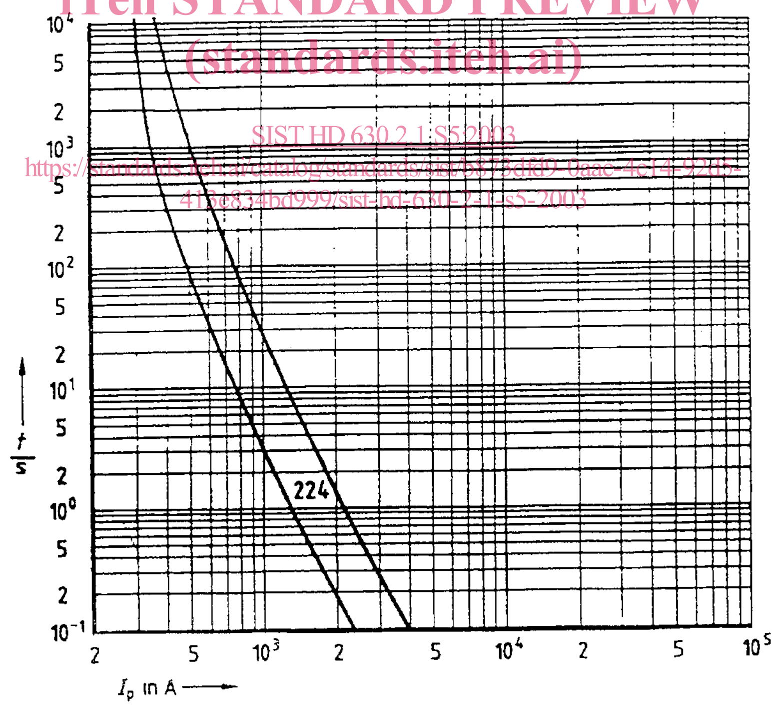
Fuse-links and fuse-bases intended to be used in an environment of pollution degree ≥ 3 according to IEC 60664-1 shall be tested with SFW 2,0 S for 5 cycles. They shall be marked accordingly.

Figures

Figure 1(I) **Replace** the first table of Figure 1(I) for "gG" by:

Size	gG					
	AC 400 V		AC 500 V		AC 690 V	
	I_n A	P_n W	I_n A	P_n W	I_n A	P_n W
00	100/160	5,5/12	100/160	7,5/12	100	12
0	160	12	160	16	100	25
1	250	18	250	23	200	32
2	400	28	400	34	315	45
3	630	40	630	48	500	60
4	-	-	1 000	90	800	90
4a	1 250	90	1 250	110	1 000	110

Figure 4(I) **Add** the time-current on for I_n = 224 A.



Add the following figures:

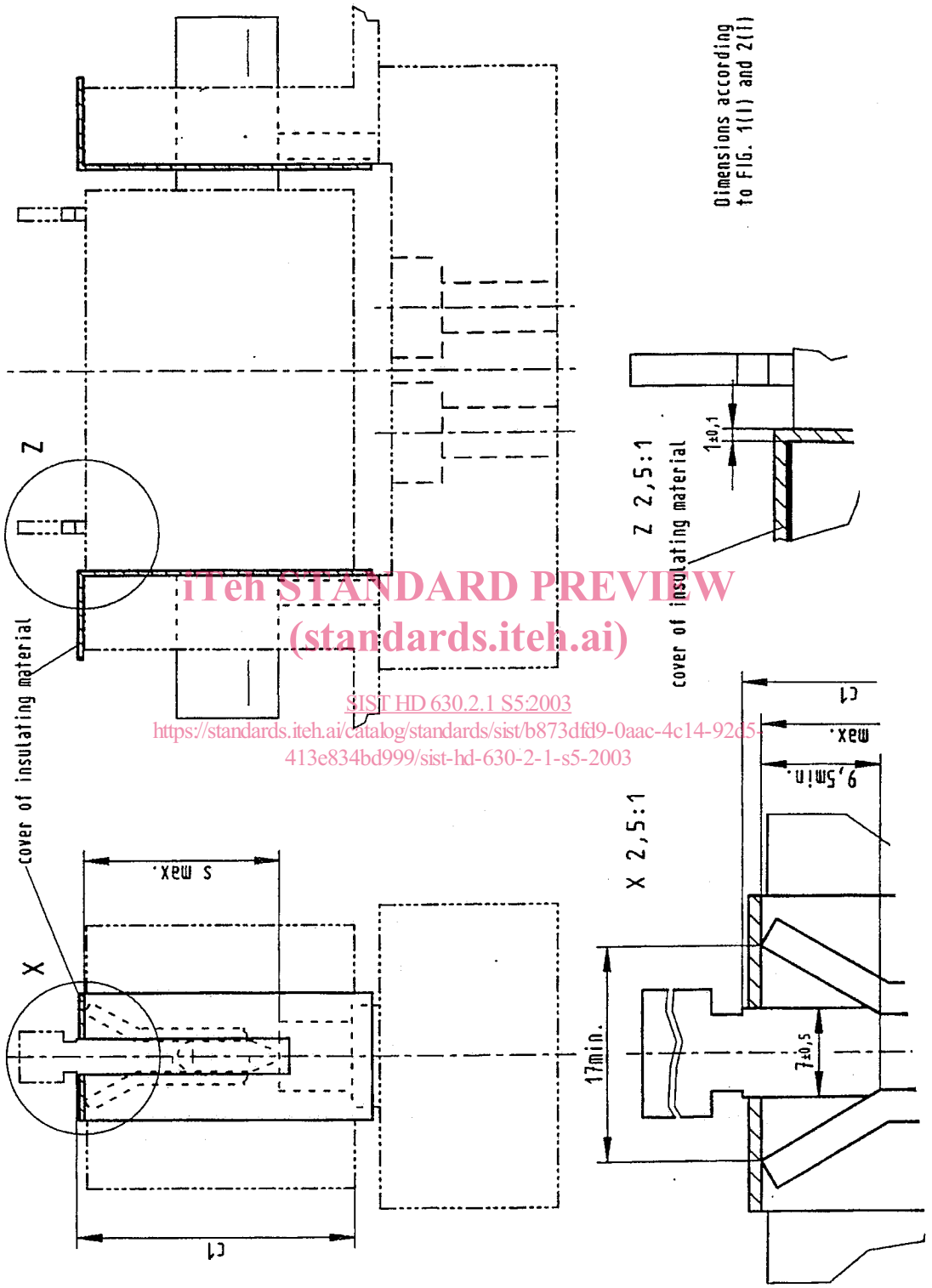
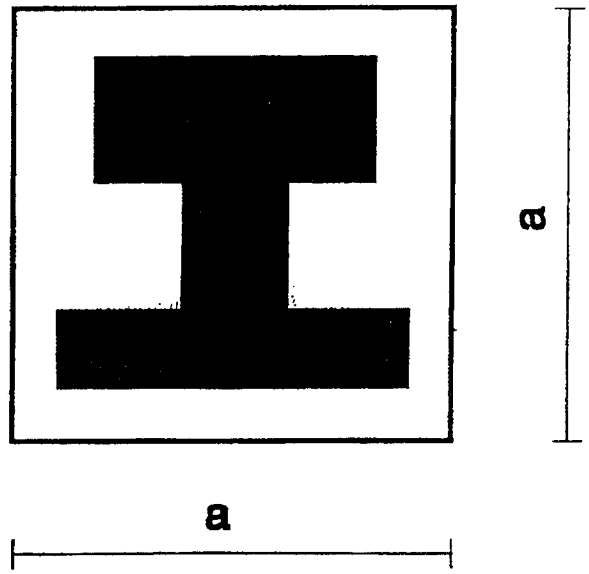


Figure 11(I) — Reference fuse-base



a ≥ 3 mm

Figure 12(l) – Design mark for isolated gripping-lugs

NORME INTERNATIONALE

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Edition 3:1998 consolidated with amendment 1:1999

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