

**SLOVENSKI
STANDARD**

SIST HD 22.4 S3:1998/A1:1999

prva izdaja
november 1999

Rubber insulated cables of rated voltages up to and including 450/750 V – Part 4:
Cords and flexible cables - Amendment A1

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b0e608231e2a/sist-hd-22-4-s3-1998-a1-1999](https://standards.iteh.ai/catalog/standards/sist/5698d520-a266-44dc-ad93-b0e608231e2a/sist-hd-22-4-s3-1998-a1-1999)

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Referenčna številka
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Descriptors: See HD 22.4 S3:1995

English version

**Rubber insulated cables of rated voltages up to
and including 450/750 V
Part 4: Cords and flexible cables**

Conducteurs et câbles isolés au
caoutchouc, de tension assignée au plus
égale à 450/750 V
Partie 4: Câbles souples

Gummi-isolierte Leitungen mit
Nennspannungen bis 450/750 V
Teil 4: Flexible Leitungen

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[SIST HD 22.4 S3:1998/A1:1999](https://standards.iteh.ai/catalog/standards/sist/5698d520-a266-44dc-ad93-80008216c2a3/sist-hd-22-4-s3-1995-a1-1999)

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This amendment A1 modifies the Harmonization Document HD 22.4 S3:1995; it was approved by CENELEC on 1998-08-01. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for implementation of this amendment 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 amendment 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, 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

This amendment was prepared by the Technical Committee CENELEC TC20, Electric cables, and agreed at the Copenhagen meeting (June 1996) to go forward to the Unique Acceptance Procedure.

This amendment has been prepared within the regular maintenance programme which covers all Parts of HD 22.

The text of the draft was submitted to the Unique Acceptance Procedure and was approved by CENELEC as amendment A1 to HD 22.4 S3:1995 on 1998-08-01 .

The following dates were fixed:

- latest date by which the existence of the amendment has to be announced at national level (doa) 1998-12-01
- latest date by which the amendment has to be implemented at national level by publication of a harmonized national standard or by endorsement (dop) 1999-06-01
- latest date by which the national standards conflicting with the amendment have to be withdrawn (dow) 2000-06-01

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ORGANISATION INTERNATIONALE
DE NORMALISATION
SISTÈME INTERNATIONAL
DE UNITÉS
ET DE MESURES
1980

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Amendment A1 to HD 22.4 S3

Contents

Against Item 3 delete the word "Tough"

Clause 3

In the title, delete the word "Tough"

Sub-clause 4.3.7

Amend the end of the sub-clause to read:

" Part 1, sub-clause 3.2"

Sub-clause 5.3.6

In line 3 of (b) delete "EM 1"

Sub-clause 5.3.8

Amend the end of the sub-clause to read:

"..... Part 1, sub-clause 3.2"

Sub-clause 6.3.6

In line 3 delete "EM 1"

Sub-clause 6.3.8

Amend the end of the sub-clause to read:

" Part 1, sub-clause 3.2"

Tables II, IV, VI, VIII and X

Delete existing Tables II, IV, VI, VIII and X and replace as attached.

Annex A

Delete HD 405.1 and HD 505

Insert:

- | | |
|--------------|--|
| EN 50265-2-1 | Common test methods for cables under fire conditions - Test for resistance to vertical flame propagation for a single insulated conductor or cable -- Part 2-1: Procedures - 1kW pre-mixed flame |
| EN 60811 | Insulating and sheathing materials of electric cables - Common test methods |

Table II
Tests for type H03RT-F

1	2	3	4	5
Ref. No.	Tests	Category of test	Test method described in	
			HD / EN	Clause
1.	<u>Electrical tests</u>			
1.1	Resistance of conductors	T, S	22.2	2.1
1.2	Voltage test on completed cable at 2000V	T, S	22.2	2.2
1.3	Absence of faults on insulation	R	22.2	2.6
2.	<u>Provisions covering constructional and dimensional characteristics</u>			
2.1	Checking of compliance with constructional provisions	T, S	22.1	Inspection and manual tests
2.2	Measurement of thickness of insulation	T, S	22.2	1.9
2.3	Measurement of overall diameter			
2.3.1	Mean value	T, S	22.2	1.11
2.4	Solderability test (Plain Conductors)	T	22.2	1.12
3.	<u>Mechanical properties of insulation</u>			
3.1	Tensile test before ageing	T	60811-1-1	9.1
3.2	Tensile test after ageing in the air oven	T	60811-1-2	8.1.3.2a
3.3	Tensile test after ageing in the air bomb	T	60811-1-2	8.2
3.4	Hot set test	T	60811-2-1	9
3.5	Ozone resistance test : either method may be used.	T		
	(a) Method A		60811-2-1	8
	(b) Method B		60811-2-1	7.3
4.	<u>Mechanical strength of completed cable</u>			
4.1	Flexing test followed, after immersion in water, by a voltage test on cores at 2000 V	T	22.2	3.1 and 2.3
4.2	Wear resistance test	T	22.2	3.3
5.	<u>Resistance to heat of textile braid</u>	T	22.2	8

Table IV
Tests for Type H05RR-F

1	2	3	4	5
Ref. No.	Tests	Category of test	Test method described in	
			HD / EN	Clause
1.	<u>Electrical tests</u>			
1.1	Resistance of conductors	T, S	22.2	2.1
1.2	Voltage test on cores according to specified insulation thickness			
1.2.1	at 1500V up to and including 0,6mm	T	22.2	2.3
1.2.2	at 2000V exceeding 0,6mm	T	22.2	2.3
1.3	Voltage test on completed cable at 2000V	T, S	22.2	2.2
1.4	Absence of faults on insulation	R	22.2	2.6
1.5	Surface resistance of sheath	T	22.2	2.7
2.	<u>Provisions covering constructional and dimensional characteristics</u>			
2.1	Checking of compliance with constructional provisions	T, S	22.1	Inspection and manual tests
2.2	Measurement of thickness of insulation	T, S	22.2	1.9
2.3	Measurement of thickness of sheath	T, S	22.2	1.10
2.4	Measurement of overall diameter			
2.4.1	Mean value	T, S	22.2	1.11
2.4.2	Ovality	T, S	22.2	1.11
2.5	Solderability test (Plain conductors)	T	22.2	1.12
3.	<u>Mechanical properties of insulation</u>			
3.1	Tensile test before ageing	T	60811-1-1	9.1
3.2	Tensile test after ageing in the air oven	T	60811-1-2	8.1.3.2a
3.3	Tensile test after ageing in the air bomb	T	60811-1-2	8.2
3.4	Hot set test	T	60811-2-1	9
4.	<u>Mechanical properties of sheath</u>			
4.1	Tensile test before ageing	T	60811-1-1	9.2
4.2	Tensile test after ageing in the air oven	T	60811-1-2	8.1.3.1
4.3	Hot set test	T	60811-2-1	9
5.	<u>Mechanical strength of completed cable</u>			
5.1	Flexing test (*) followed, after immersion in water, by a voltage test on cores			
	- at 1500V on cores with specified insulation thickness up to and including 0,6mm	T	22.2	3.1 and 2.3
	- at 2000V on cores with specified insulation thickness exceeding 0,6mm	T	22.2	3.1 and 2.3
6.	<u>Carbon black content of sheath</u> (where applicable)	T	60811-4-1	11
7.	<u>Ozone resistance test for insulation and sheath</u> (either method may be used)	T		
	(a) Method A		60811-2-1	8
	(b) Method B		22.2	7.3

(*) Not applicable to cables with conductors greater than 4mm²

Table VI
Tests for Type H05RN-F

1	2	3	4	5
Ref. No.	Tests	Category of tests	Test method described in	
			HD / EN	Clause
1.	<u>Electrical tests</u>			
1.1	Resistance of conductors	T, S	22.2	2.1
1.2	Voltage test on cores at 1500V	T	22.2	2.3
1.3	Voltage test on completed cable at 2000V	T, S	22.2	2.2
1.4	Absence of faults on insulation	R	22.2	2.6
1.5	Surface resistance of sheath	T	22.2	2.7
2.	<u>Provisions covering constructional and dimensional characteristics</u>			
2.1	Checking of compliance with constructional provisions	T, S	22.1	Inspection and manual tests
2.2	Measurement of thickness of insulation	T, S	22.2	1.9
2.3	Measurement of thickness of sheath	T, S	22.2	1.10
2.4	Measurement of overall diameter			
2.4.1	Mean value	T, S	22.2	1.11
2.4.2	Ovality	T, S	22.2	1.11
2.5	Solderability test (Plain Conductors)	T	22.2	1.12
3.	<u>Mechanical properties of insulation</u>			
3.1	Tensile test before ageing	T	60811-1-1	9.1
3.2	Tensile test after ageing in the air oven	T	60811-1-2	8.1.3.2a
3.3	Tensile test after ageing in the air bomb	T	60811-1-2	8.2
3.4	Hot set test	T	60811-2-1	9
4.	<u>Mechanical properties of sheath</u>			
4.1	Tensile test before ageing	T	60811-1-1	9.2
4.2	Tensile test after ageing in the air oven	T	60811-1-2	8.1.3.1
4.3	Tensile test after immersion in oil	T	60811-2-1	10
4.4	Hot set test	T	60811-2-1	9
5.	<u>Mechanical strength of completed cable</u>			
5.1	Flexing test followed, after immersion in water, by a voltage test on cores at 1500V	T	22.2	3.1 and 2.3
6.	<u>Test under fire conditions</u>	T	50265-2-1	-
7.	<u>Tests at low temperature</u>			
7.1	Bending test for sheath	T	60811-1-4	8.2
8.	<u>Ozone resistance test for insulation (either method may be used)</u>	T		
	(a) Method A		60811-2-1	8
	(b) Method B		22.2	7.3

Table VIII
Tests for Type H07RN-F

1	2	3	4	5
Ref. No.	Tests	Category of test	Test method described in	
			HD / EN	Clause
1.	<u>Electrical tests</u>			
1.1	Resistance of conductors	T, S	22.2	2.1
1.2	Voltage test on cores at 2500V	T	22.2	2.3
1.3	Voltage test on completed cable at 2500V	T, S	22.2	2.2
1.4	Absence of faults on insulation	R	22.2	2.6
1.5	Surface resistance of sheath	T	22.2	2.7
2.	<u>Provisions covering constructional and dimensional characteristics</u>			
2.1	Checking of compliance with constructional provisions	T, S	22.1	Inspection and manual tests
2.2	Measurement of thickness of insulation	T, S	22.2	1.9
2.3	Measurement of thickness of sheath	T, S	22.2	1.10
2.4	Measurement of overall diameter			
2.4.1	Mean value	T, S	22.2	1.11
2.4.2	Ovality	T, S	22.2	1.11
2.5	Solderability test (Plain Conductors)	T	22.2	1.12
3.	<u>Mechanical properties of insulation</u>			
3.1	Tensile test before ageing	T	60811-1-1	9.1
3.2	Tensile test after ageing in the air oven	T	60811-1-2	8.1.3.2a
3.3	Tensile test after ageing in the air bomb	T	60811-1-2	8.2
3.4	Hot set test	T	60811-2-1	9
4.	<u>Mechanical properties of sheath</u>			
4.1	Tensile test before ageing	T	60811-1-1	9.2
4.2	Tensile test after ageing in the air oven	T	60811-1-2	8.1.3.1
4.3	Tensile test after immersion in oil	T	60811-2-1	10
4.4	Hot set test	T	60811-2-1	9
5.	<u>Mechanical strength of completed cable</u>			
5.1	Flexing test (*) followed, after immersion in water, by a voltage test on cores at 2000V	T	22.2	3.1 and 2.3
6.	<u>Test under fire conditions</u>	T	50265-2-1	-
7.	<u>Tests at low temperature</u>			
7.1	Bending test for sheath (+)	T	60811-1-4	8.2
7.2	Elongation test for sheath (‡)	T	60811-1-4	8.4
8.	<u>Ozone resistance test for insulation</u> (either method may be used)	T		
	(a) Method A		60811-2-1	8
	(b) Method B		22.2	7.3
(*) Not applicable to single core cables, or to multicore cables having conductors greater than 4mm ² (+) Only applicable to cables having mean overall diameters up to and including 12,5mm (‡) Only applicable if the mean overall outer diameter of the cable exceeds 12,5mm and conductor cross-section does not exceed 16mm ²				