



SLOVENSKI STANDARD
SIST HD 620 S1:1998/A2:2004
01-januar-2004

Amendment 2 to HD according to maintenance programme - Group 2

Distribution cables with extruded insulation for rated voltages from 3,6/6 (7,2) kV to 20,8/36 (42) kV

Energieverteilungskabel mit extrudierter Isolierung für Nennspannungen von 3,6/6 (7,2) kV bis 20,8/36 (42) kV

Câbles de distribution, à isolation extrudée, pour des tensions assignées de 3,6/6 (7,2) kV à 20,8/36 (42) kV inclus

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Ta slovenski standard je istoveten z: **HD 620 S1:1996/A2:2003**

ICS:

29.060.20 Kabli Cables

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HARMONIZATION DOCUMENT

HD 620 S1/A2

DOCUMENT D'HARMONISATION

HARMONISIERUNGSDOKUMENT

August 2003

ICS 29.060.20

English version

**Distribution cables with extruded insulation
for rated voltages from 3,6/6 (7,2) kV to 20,8/36 (42) kV**

Câbles de distribution, à isolation
extrudée, pour des tensions assignées
de 3,6/6 (7,2) kV à 20,8/36 (42) kV inclus

Energieverteilungskabel mit extrudierter
Isolierung für Nennspannungen
von 3,6/6 (7,2) kV bis 20,8/36 (42) kV

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This amendment A2 modifies the Harmonization Document HD 620 S1:1996; it was approved by CENELEC on 2003-03-01. 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 one official version (English).

CENELEC members are the national electrotechnical committees of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Lithuania, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, 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 to HD 620 S1:1996 has been prepared by WG 9 of CENELEC TC 20 "Electric cables". CENELEC TC 20 confirmed at its meeting (Paris, May 2001) that the amendment should go to the Unique Acceptance Procedure.

Some detailed amendments are made to Part 1. A list of additions and amendments to the particular sections of Parts 5 to 9 is given in this Part 0.

The text of the draft was submitted to the Unique Acceptance Procedure in June 2002 and was approved by CENELEC as amendment A2 to HD 620 S1:1996 on 2003-03-01.

The following dates were fixed:

- latest date by which the existence of the amendment has to be announced at national level (doa) 2003-09-01
- latest date by which the amendment has to be implemented at national level by publication of a harmonized national standard or by endorsement (dop) 2004-03-01
- latest date by which the national standards conflicting with the amendment have to be withdrawn (dow) 2006-03-01

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- (1) A1 introduces some changes to the text
(2) A1 completely revises the particular section
(3) Item withdrawn by A1
(4) A1 introduces new section
(5) A2 introduces some changes to the text
(6) A2 completely revises the particular section
(7) Item withdrawn by A2
(8) A2 introduces new section

PART 6 XLPE insulated three core cables

- 6-A⁽⁵⁾ Cables with PE (Type 6A-1) or PVC sheath (Type 6A-2)
 6-C⁽²⁾⁽⁵⁾ Cables with PE (Type 6C-1) or PVC sheath (Type 6C-2)
 6-D Cables with PE (Type 6D-1) or PVC (Type 6D-2) sheath
 6-F⁽⁶⁾ Cables with PVC sheath and individual copper screen (Type 6F-1), cables with PE sheath and individual copper screen (Type 6F-2) and cables with PE sheath and common copper screen (Type 6F-3)
 6-J⁽²⁾⁽⁶⁾ Cables with PE (Type 6J-1) or PVC sheath (Type 6J-2) or PVC flame retardant sheath (Type 6J-3)
 6-K⁽⁶⁾ Cables with PE (Type 6K-1) or PVC sheath (Type 6K-2)
 6-M⁽¹⁾⁽⁶⁾ Cables with PE sheath (Type 6M-1) and PVC sheath (Type 6M-2)
 6-N⁽¹⁾ Cables with PE sheath (Type 6N-1) or PVC sheath (Type 6N-2)
 6-O-1⁽¹⁾⁽⁷⁾ (Spare)
 6-O-2⁽¹⁾⁽⁷⁾ (Spare)
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 6-O-4⁽⁸⁾ Three core, 11 kV XLPE insulated cables with copper or steel wire collective metal screen and MDPE oversheath (Type 6O-4)

PART 7 EPR insulated single core cables, and single core pre-assembled cables

- 7-E-1⁽²⁾⁽⁵⁾ Cables with polyolefine compound sheath (Type 7E-1)
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 7-O-1⁽¹⁾⁽⁷⁾ (Spare)
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 7-O-3⁽¹⁾⁽⁷⁾ (Spare)
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PART 8 EPR insulated three core cables

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PART 9 HEPR insulated single core cables, and single core pre-assembled cables

- 9-E⁽⁴⁾⁽⁵⁾ Cables with HEPR insulation and polyolefine compound sheath (Type 9E)
 9-I-1⁽²⁾ Cables with HEPR insulation, PE sheath and Alumoweld messenger (Aerial cables, Type 9I-1)
 9-I-2 Cables with HEPR insulation and PVC sheath, single core and pre-assembled type (Type 9I-2)

(1) A1 introduces some changes to the text
 (2) A1 completely revises the particular section
 (3) Item withdrawn by A1
 (4) A1 introduces new section
 (5) A2 introduces some changes to the text
 (6) A2 completely revises the particular section
 (7) Item withdrawn by A2
 (8) A2 introduces new section

HD 620 S1:1996/A2:2003

Distribution cables with extruded insulation for rated voltages
from 3,6/6 (7,2) kV to 20,8/26 (42) kV
Part 1: General requirements

Replace pages 1-18, 1-26, 1-29, 1-31, 1-32 and 1-33 (as amended by A1:2001) by the following:

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Table 2B – Requirements of insulating compounds – EPR (concluded)

1	2	3	4	5	6
Compound No.⁽¹⁾	Unit	DIE 3	DIE 4	DIE 5	DIE 6
Type		EPR insulation	EPR insulation	EPR insulation	EPR insulation
Maximum operating temperature of the conductor	°C	90	90	90	90
Physical and chemical properties					
hot set test					
temperature	°C	250	250	250	250
duration	min	15	15	15	15
mechanical stress	MPa	0,2	0,2	0,2	0,2
maximum elongation under load	%	175	175	175	175
maximum residual elongation	%	15	15	15	15
hot modulus					
duration	min	-	15	-	-
temperature	°C	-	130	-	-
minimum strength at 100%	MPa	-	1,75	-	-
water absorption					
temperature	°C	85	70	100	100
duration	h	336	336	24	24
a) maximum variation of mass	mg/cm ²	5	0,8	3	3
b) with DC voltage: no breakdown					
insulation resistance Ki (min. value)					
at 20°C	MΩ.km	3670	-	3670	3670
at 60°C	MΩ.km	-	-	-	-
at 70°C	MΩ.km	-	-	-	-
at 90°C	MΩ.km	3,67	-	3,67	3,67
ozone resistance test					
duration	h	24	24	30	24
concentration of ozone	ppm	250 to 300	250 to 300	250 to 300	250 to 300
temperature	°C				
<p>⁽¹⁾ The applicable test methods for each compound are given in the relevant Particular Section.</p> <p>NOTE 1 MPa = 1 N/mm²</p> <p>Remark: The tolerance on temperature values is given in HD 605, 1.5.2, but may be varied if specified in the particular sections.</p>					

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Table 4A – Requirements of sheathing compounds : PVC (continued)

1	2	9	10	11	12	13	14	15
Compound No⁽¹⁾	Unit	DMV 26	DMV 28	DMV 29	DMV 30	DMV 31	DMV 32	DMV 33
Type		PVC sheath	PVC sheath	PVC sheath	PVC sheath	PVC sheath	PVC sheath	PVC sheath
Maximum operating temperature of the conductor	°C	90	90	90	90	90	90	90
Physical and chemical properties								
loss of mass								
duration	h	168	168	168	168	168	168	-
temperature	°C	100	100	100	100	100	100	-
maximum loss of mass	mg/cm ²	1,5	1,5	1,5	1,5	1,5	1,5	-
pressure test at high temperature								
duration	h	6	6	6	6	4/6	4/6	4/6
temperature	°C	80	90	90	90	90	80	80
coefficient k		-	0,7	0,7	0,7	-	0,6/0,7	0,8
maximum depth of indentation	%	50	50	50	50	50	50	50
heat shock test								
duration	h	1	1	1	1	1	1	-
temperature	°C	150	150	150	150	150	150	-
tests at low temperature								
elongation test at low temperature								
temperature	°C	-15	-15	-15	-15	-15	-25	-5
minimum elongation	%	20	20	20	20	20	20	20
impact test at low temperature								
temperature	°C	-15	-15	-15	-15	-15	-25	-
bending test at low temperature								
temperature	°C	-	-15/-25	-	-	-15	-	-5

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Table 4B – Requirements of sheathing compounds : PE (continued)

1	2	3	4	5	6	7	8
Compound No⁽¹⁾	Unit	DMP 2	DMP 5	DMP 8	DMP 9	DMP 10	DMP 11
Type		PE sheath	PE sheath	PE sheath	PE sheath	PE sheath	PE sheath
Maximum operating temperature of the conductor	°C	90	90	90	90	90	90
Physical and chemical properties							
pressure test at high temperature							
duration	h	4/6	6	6	6	6	1
temperature	°C	115	115	115	115	90	115
coefficient k		-	-	-	0,8	0,7	-
maximum depth of indentation	%	30	50	30	30	50	30
shrinkage test							
duration	h	-	-	5 x 5	5 x 5	-	-
temperature	°C	-	-	80	80	-	-
maximum shrinkage	%	-	-	7	-	-	-
	mm	-	-	-	7	-	-
tests at low temperature							
elongation test at low temperature							
temperature	°C	-	-	-	-	-20	-
minimum elongation	%	-	-	-	-	20	-
impact test at low temperature							
temperature	°C	-	-	-	-	-20	-
bending test at low temperature							
temperature	°C	-	-	-	-	-20	-
carbon black content							
	%	2,5 ± 0,5	-	2,5 ± 0,5	2,5 ± 0,5	≥ 2,0	≥ 2,0
shore D-hardness							
minimum		55	-	55	-	-	55

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Table 4B – Requirements of sheathing compounds : PE

1	2	10	11	12	13	14	15	16
Compound No ⁽¹⁾	Unit	DMP 12	DMP 13	DMP 14	DMP 15	DMP 16	DMP 17	DMP 18
Type		PE sheath	PE sheath	PE sheath	PE sheath	PE sheath	PE sheath	PE sheath
Maximum operating temperature of the conductor	°C	90	90	90	90	90	90	90
Mechanical properties								
- before ageing on sample								
minimum tensile strength	MPa	10	15	10	12,5	12,5	10,5	12,5
minimum elongation at break	%	300	350	300	300	300	300	300
- after ageing on sample								
temperature	°C	100	110	100	110	110	100	110
duration T1	h	240	336	240	336	336	240	240
minimum tensile strength	MPa	-	15	-	-	-	-	-
maximum variation T1/T0	%	-	±25	-	-	-	-	-
minimum elongation at break	%	300	350	300	300	300	300	300
maximum variation T1/T0	%	-	±25	-	-	-	-	-
- after ageing on complete cable (non contamination test)								
temperature	°C	100	100	100	100	100	-	100
duration T1	h	-	-	-	-	-	-	336
duration T2	h	168	168	168	168	168	-	1008
minimum tensile strength	MPa	-	15	-	-	-	-	-
maximum variation T2/T0	%	-	±25	-	-	-	-	±30
maximum variation T2/T1	%	-	-	-	-	-	-	±20
minimum elongation at break	%	300	350	300	300	300	-	-
maximum variation T2/T0	%	-	±25	-	-	-	-	±40
maximum variation T2/T1	%	-	-	-	-	-	-	±25

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