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INFORMATION SHEET
Issue 1 1992-11-10

HD 22.1 S2/A13
November 1992

Rubber insulated cables of rated voltages up to and including 450/750 V Part 1: General requirements

Conducteurs et câbles isolés au caoutchouc, de tension assignée au plus égale à 450/750 V Première partie: Prescriptions générales

Isolierte Starkstromleitungen mit einer Isolierung aus Gummi mit Nennspannungen bis 450/750 V Teil 1: Allgemeine Anforderungen

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Related to Directive: 73/23/EEC

This amendment consists of the following:

- Title Page
- Text prepared by CENELEC Technical Committee TC 20

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date of ratification : 1992-09-15
date of announcement : 1993-03-01
date of latest publication : 1993-09-01
date of withdrawal : 1993-09-01

LIST OF NATIONAL STANDARDS IS GIVEN OVERLEAF

AT :

BE :

CH :

DE :

DK :

ES :

FI :

FR :

GB :

GR :

IE :

IS :

IT :

LU :

NL :

NO :

PT :

SE :

NOS No standard
SP Standard in preparation
NR Standard under revision

HARMONIZATION DOCUMENT

DOCUMENT D'HARMONISATION

HARMONISIERUNGSDOKUMENT

HD 22.1 S2/A13

November 1992

UDC 621.315.211.2.027.475-777.1/.2-777.6.001.2.002.2.001.4(083.71)
(083.73)621.315.616
Descriptors: see HD 22.1 S2:1992

ENGLISH VERSION

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This amendment modifies the Harmonization Document HD 22.1 S2:1992. It was approved by CENELEC on 1992-09-15. CENELEC members are bound to comply with the CEN/CENELEC Inernal Regulations which stipulate the conditions for implementation of this amendment on a national level.

Up-to-date lists and bibliographical references concerning 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 and German).

CENELEC members are the national electrotechnical committees of Austria, Belgium, 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

Ref. No. HD 22.1 S2:1992/A13:1992 E

FOREWORD

Following a decision taken by CENELEC Technical Committee TC 20 some supplementary common modifications to the International Standard IEC 245-1:1980 were submitted to the CENELEC Unique Acceptance Procedure (UAP) in November 1991 for acceptance as an amendment to HD 22.1 S2.

The text of the draft was approved by CENELEC as amendment A13 to HD 22.1 S2 on 15 September 1992.

The following dates were fixed:

- latest date of announcement of the amendment at national level	(doa)	1993-03-01
- latest date of publication of a harmonized national standard	(dop)	1993-09-01
- latest date of withdrawal of conflicting national standards	(dow)	1993-09-01

For products which have complied with HD 22.1 S2:1992 and its amendments before 1993-09-01, as shown by the manufacturer or by a certification body, this previous standard may continue to apply for production until 1994-09-01.

CLAUSE 2: DEFINITIONS

Add new sub-clause:

2.1.5 **Polyolefin based cross-linked compound or other equivalent synthetic compound having a low level of emission of corrosive gases**

A crosslinked compound in which the polymer is a polyolefin or equivalent synthetic non-halogenated polymer providing a compound which, when burned, has low emission of corrosive gases and is suitable for use in cables which, when burned, have low emission of smoke.

SUB-CLAUSE 4.2.2: SINGLE CORE NON-SHEATHED CABLES

Amend first sentence to read:

For cable types H07G (Part 7, Clause 2) and H07Z (Part 9, Clause 2 and 3) the following mono-colours are recognised: ....

TABLE I

Delete existing table and insert attached to include EI 5

SUB-CLAUSE 5.2.1 MATERIAL

Insert new lines:

Type EI 5 for cables insulated with polyolefin-based cross-linked compound having a low level of emission of corrosive gases and which is suitable for use in cables which, when burned, have low emission of smoke.

AND

90°C for compound EI 5.

TABLE III

Insert new section as follows:

1	2	3	4	5	6	7	8
Ref. No.	Test	Unit	Rated voltage of cables			Test method described in	
			300/300V	300/500V	450/750V	HD	Clause
4.	Measurement of insulation resistance					22.2	2.4.1
4.1	Test conditions						
	- length of sample from the previous voltage test (ref. 2 or 3)	m	-	5	5		
	- minimum period of immersion in hot water	h	-	2	2		
	- temperature of the water	°C	-	****	****		
4.2	Results to be obtained	MΩ	-	****	****		

**** See tables in the particular specifications (Part 9)

TABLE I

Requirements for the non-electrical test for cross-linked insulation

1	2	3	4	5	6	7	8	9
Ref. No.	Test	Unit	Type of compound				Test method described in	
			EI 2	EI 3	EI 4	EI 5	HD	Clause
1.	**Tensile strength and elongation at break**							
1.1	Properties in the state as delivered						505.1.1	9.1
1.1.1	Values to be obtained for the tensile strength: - median, min.	N/mm²	5.0	6.5	5.0	10.0		
1.1.2	Values to be obtained for the elongation at break: - median, min.	%	150	200	200	125		
1.2	Properties after ageing in air oven						505.1.2	8.1
1.2.1	Ageing conditions: 2) 4) - temperature - duration of treatment	°C h	200±3 10x24	150±3 10x24	100±2 7x24	135±2 7x24		
1.2.2	Value to be obtained for the tensile strength: - median, min. - variation 1) max.	N/mm² %	4.0 -	- ±30	4.2 ±25	- ±30		
1.2.3	Values to be obtained for the elongation at break: - median, min. - variation 1) max.	% %	120 -	- ±30	200 ±25	- ±30		
1.3	**(Spare)**							
1.4	**Properties after ageing in the oxygen bomb for seven days**						505.1.2	8.3
1.4.1	Ageing conditions: - temperature - duration of treatment	°C h	- -	- -	70±1 7x24	- -		
1.4.2	Value to be obtained for the tensile strength: - median, min. - variation 1) max.	N/mm² %	- -	- -	- ±25	- -		
1.4.3	Values to be obtained for the elongation at break: - median, min. - variation 1) max.	% %	- -	- -	- ±25	- -		

TABLE I
(continued)

1	2	3	4	5	6	7	8	9
Ref. No.	Test	Unit	Type of compound				Test method described in	
			EI 2	EI 3	EI 4	EI 5	HD	Clause
1.5	Properties after ageing in the air bomb						505.1.2	8.2
1.5.1	Ageing conditions							
	- temperature	°C	-	150±2	-	-		
	- duration of treatment	h	-	7x24	-	-		
1.5.2	Values to be obtained for the tensile strength							
	- median, min	N/mm²	-	6.0	-	-		
1.5.3	Values to be obtained for the elongation at break							
	- variation, max	%	-	-30(3)	-	-		
2.	**Hot set test**						505.2.1	9
2.1	Conditions of treatment							
	- temperature	°C	250±3	200±3	200±3	200±3		
	- time under load	min	15	15	15	15		
	- mechanical stress	N/cm²	20	20	20	20		
2.2	Test requirements							
	- max. elongation under load	%	100	100	100	100		
	- max. elongation after unloading	%	25	25	25	25		
3.	**Pressure test at high temperature**						505.3.1	8
3.1	Test conditions							
	- force exerted by blade							
	- K value :		-	1.0	-	1.0		
	- duration of heating under load 5)	h	-	0.5	-	4or6		
	- temperature	°C	-	150±2	-	100±2		
3.2	Result to be obtained							
	- median of the depth of penetration max	%	-	50	-	50		

TABLE I
(continued)

1	2	3	4	5	6	7	8	9
Ref. No.	Test	Unit	Type of compound				Test method described in	
			EI 2	EI 3	EI 4	EI 5	HD	Clause
4.	**Ozone resistance test**							
	Method A							
	Test conditions						505.2.1	8
	- test temperature	°C	-	-	25 ± 2	25 ± 2		
	- test duration	h	-	-	24	24		
	- ozone concentration	ppm	-	-	250 to 300	250 to 300		
	Method B						22.2	7.3
	- test temperature	°C	-	-				
	- test duration	h	-	-	40 ± 2	40 ± 2		
	- ozone concentration	pphm	-	-	72	72		
					200 ± 50	200 ± 50		
5.	**Low temperature tests**							
5.1	Bending test						505.1.4	8.1
5.1.1	Test conditions							
	- temperature	°C	-	-				
	- period of application of low temperature		-	-	-	-15 ± 2	505.1.4	8.1.4 and 8.1.5
					-	**		
5.1.2	Result to be obtained		-	-				
					-	No cracks		
5.2	Elongation test						505.1.4	8.3
5.2.1	Test conditions							
	- temperature	°C	-	-				
	- period of application of low temperature		-	-	-	-15 ± 2	505.1.4	8.3.4 and 8.3.5
					-	**		
5.2.2	Result to be obtained							
	- elongation without break (min)	%	-	-	-	30		
5.3	Impact test						505.1.4	8.5
5.3.1	Test conditions							
	- temperature	°C	-	-				
	- period of application of low temperature		-	-	-	-15 ± 2	505.1.4	8.5.5
					-	**		
	- mass of hammer		-	-			505.1.4	8.5.4
					-	**		
5.3.2	Result to be obtained		-	-			505.1.4	8.5.6
					-	**		

TABLE I
(concluded)

1	2	3	4	5	6	7	8	9
Ref. No.	Test	Unit	Type of compound				Test Method described in	
			EI 2	EI 3	EI 4	EI 5	HD	Clause
6.	**Acidic (corrosive) gases evolved**							
6.1	- pH (weighted minimum)		-	-	-	4.3	602	
	- conductivity (maximum)	μS/mm	-	-	-	10	602	

** See test method referred to in columns 8 and 9

1) Variation Difference between the median value after ageing and the median value without ageing, expressed as a percentage of the latter.

2) Unless otherwise specified in the relevant cable specifications a rotating fan inside the oven is normally permissible when testing rubber compounds. However, in case of dispute, ageing shall be carried out in an oven which is designed to operate without a fan rotating inside it.

3) No limit for the positive tolerance.

4) Ageing of Type EI 4 should be carried out with the conductor in place, or with not more than 30% of the conductor strands removed. Ageing of Type EI 5 should be carried out in accordance with sub-clause 8.1.3.1 of HD 505.1.2.

5) For EI 5 duration of heating depends on cable dimension. Four hours for cables of mean overall diameter up to and including 15mm, six hours for cables of mean overall diameter greater than 15mm.