BS EN 50525-3-21:2011

BSI Standards Publication

Electric cables — Low voltage energy cables of rated voltages up to and including 450/750 V (U_0/U)

Part 3-21: Cables with special fire performance — Flexible cables with halogen-free crosslinked insulation, and low emission of smoke

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National foreword

This British Standard is the UK implementation of EN 50525-3-21:2011.

In the UK, the BS EN 50525 series of standards contain complex supersession details. The table below best summarizes the relationship between these standards:

Part 1 together with	Supersedes
2-81	BS 638-4:1996
2-41, 2-42	BS 6007: 2006
2-11 (in part), 2-12, 2-21 (in part), 2-71	BS 6500:2000
2-11 (in part), 2-21 (in part), 2-51 (in part), 2-83, 3-21	BS 7919:2001
2-31, 2-51 (in part)	**BS 6004:2000**
3-41	**BS 7211:1998**
2-22, 2-72, 2-82, 3-11, 3-31	None

NOTE All British Standards will remain current until they are withdrawn on 31 December 2012. British Standards in bold are only partially superseded, and new editions of BS 6004 and BS 7211 will be introduced on 1 January 2013.

National Annex NA (informative) gives information on the origins and identification of particular cable types.

The UK participation in its preparation was entrusted to Technical Committee GEL/20/17, Electric Cables - Low voltage.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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Compliance with a British Standard cannot confer immunity from legal obligations.

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Amendments issued since publication

Date	Text affected

EUROPEAN STANDARD

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EN 50525-3-21

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Supersedes HD 22.13 S2:2007

English version

Electric cables - Low voltage energy cables of rated voltages up to and including 450/750 V (U_0/U) - Part 3-21: Cables with special fire performance - Flexible cables with halogen-free crosslinked insulation, and low emission of smoke

Câbles électriques -
Câbles d'énergie basse tension de tension assignée au plus égale à 450/750 V (U_0/U) -
Partie 3-21: Câbles à performances spéciales au feu -
Câbles souples isolés en matériau élastomère réticulé sans halogène, à faible dégagement de fumée

Kabel und Leitungen -
Starkstromleitungen mit Nennspannungen bis 450/750 V (U_0/U) -
Teil 3-21: Starkstromleitungen mit verbessertem Verhalten im Brandfall -
Flexible halogenfreie, raucharme Leitungen mit vernetzter Isolierung

This European Standard was approved by CENELEC on 2011-01-17. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

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

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

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CENELEC

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

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Ref. No. EN 50525-3-21:2011 E

Foreword

This European Standard was prepared by the Technical Committee CENELEC TC 20, Electric cables.

The text of the draft was submitted to the formal vote and was approved by CENELEC as EN 50525-3-21 on 2011-01-17.

This document, which is one of a multipart series, supersedes HD 22.13 S2:2007.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN and CENELEC shall not be held responsible for identifying any or all such patent rights.

The following dates were fixed:

– latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2012-01-17
– latest date by which the national standards conflicting with the EN have to be withdrawn	(dow)	2014-01-17

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Contents

Tables

1 Scope

EN 50525-3-21 applies to flexible cables, insulated and sheathed with halogen-free crosslinked compound and having low emission of smoke and corrosive gases when exposed to fire.

NOTE 1 Low emission of smoke is checked in accordance with EN 61034-2. Low emission of corrosive gases is checked as part of the check for absence of halogens (see Annex B of EN 50525-1).

The cables are of rated voltage U_0/U 450/750 V.

The cables are intended for the connection of equipment and machinery to the fixed supply.

The maximum conductor operating temperature for each of the cables in this standard is 90 °C.

NOTE 2 HD 516 contains extensive guidance on the safe use of cables in this standard.

This EN 50525-3-21 should be read in conjunction with EN 50525-1, which specifies general requirements.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

NOTE One or more references to the standards below are in respect of a specific sub-division of that standard, for instance a clause, a table, a class or a type. Cross-references to these standards are undated and, at all times, the latest version applies.

EN 50363-5	Insulating, sheathing and covering materials for low voltage energy cables - Part 5: Halogen-free, cross-linked insulating compounds
EN 50363-6	Insulating, sheathing and covering materials for low voltage energy cables - Part 6: Halogen-free, cross-linked sheathing compounds
EN 50395	Electrical test methods for low voltage energy cables
EN 50396	Non electrical test methods for low voltage energy cables
EN 50525-1	Electric cables - Low voltage energy cables of rated voltages up to and including 450/750 V (U_0/U) - Part 1: General requirements
EN 60228	Conductors of insulated cables (IEC 60228)
EN 60332-1-2	Tests on electric and optical fibre cables under fire conditions - Part 1-2: Test for vertical flame propagation for a single insulated wire or cable - Procedure for 1 kW pre-mixed flame (IEC 60332-1-2)
EN 60332-3-24	Tests on electric and optical fibre cables under fire conditions – Part 3-24: Test for vertical flame spread of vertically-mounted bunched wires or cables - Category C (IEC 60332-3-24)
EN 60811-1-2	Insulating and sheathing materials of electric and optical cables - Common test methods - Part 1-2: General application - Thermal ageing methods (IEC 60811-1-2)
EN 60811-1-4	Insulating and sheathing materials of electric and optical cables - Common test methods - Part 1-4: General application - Tests at low temperature (IEC 60811-1-4)
EN 61034-2	Measurement of smoke density of cables burning under defined conditions - Part 2: Test procedure and requirements (IEC 61034-2)

3 Terms and definitions

For the purposes of this document the terms and definitions given in Clause 3 of EN 50525-1 apply.

4 Heat resistant cables (90 °C)

4.1 Heavy duty cables – H07ZZ-F

4.1.1 Construction

4.1.1.1 Conductor

The conductor shall be class 5, according to EN 60228.

4.1.1.2 Sizes of cable

The sizes of cable shall be:

- single core – 1,5 mm^2 to 630 mm^2;
- 2 and 5 core – 1,0 mm^2 to 25 mm^2;
- 3 and 4 core – 1,0 mm^2 to 300 mm^2.

4.1.1.3 Insulation

The insulation shall be a cross-linked compound, Type EI 8 to EN 50363-5, applied around each conductor.

4.1.1.4 Assembly

The cores of cables having two to five cores shall be twisted together.

NOTE 1 A centre filler may be used.

NOTE 2 A tape may be applied around the core assembly before application of the sheath.

4.1.1.5 Sheath

The cores shall be covered with a sheath.

a) For cables with a specified sheath thickness up to and including 2,4 mm:

   1) sheath in a single layer, cross-linked compound of type EM 8 to EN 50363-6.

b) For cables with a specified sheath thickness greater than 2,4 mm:

   1) sheath either in a single layer, cross-linked compound of type EM 8 to EN 50363-6;

   2) or in two layers, with the inner layer made of one of the cross-linked compounds type EM 8 or EM 10 to EN 50363-6 and the outer layer of the cross-linked compound type EM 8 to EN 50363-6.

The sheath applied in a single layer or the inner layer of the sheath in two layers shall, for cables with two to five cores, fill the spaces between the cores. Where a tape of suitable

material is applied around the core assembly (see NOTE 2 to 4.1.1.4) this requirement shall not apply, provided that the finished cables shall not have any substantial cavity in the outer interstices between the cores.

4.1.1.6 Marking

The cable shall be marked with the CENELEC code H07ZZ-F. The marking shall comply with Clause 6 of EN 50525-1.

4.1.2 Requirements

Each cable shall comply with the appropriate requirements given in EN 50525-1, and the particular requirements of this Part.

Testing shall be in accordance with Annex A.

The dimensions of the cables shall conform to Table B.1 for the relevant size.

The requirements to be met for the compatibility test shall be as given in Annex C.

When tested in accordance with the method and procedure given in EN 61034-2, all sizes of cable shall exceed 60 % light transmittance throughout the test.

4.2 Heavy duty multicore cables – H07ZZ-F

4.2.1 Construction

4.2.1.1 Conductor

The conductor shall be class 5, according to EN 60228.

4.2.1.2 Sizes of cable

The sizes of cable shall be:

- 6, 7, 12, 18, 24 and 36 core – 1,5 mm^2 and 2,5 mm^2;
- 6, 7, 12 and 18 core – 4 mm^2.

NOTE The number of cores is preferred. Other numbers of cores, between the minimum and maximum for each conductor size, are permitted. See also footnote c to Table B.2.

4.2.1.3 Insulation

The insulation shall be a cross-linked compound, Type EI 8 to EN 50363-5, applied around each conductor.

The identification of each core shall be in accordance with Annex D of EN 50525-1.

4.2.1.4 Assembly

The cores shall be twisted together. A single core in the centre is not permitted. A protective conductor, if any, shall be applied in the outer layer. A centre filler shall be used for cables having 6, 7, 18, and 36 cores, and also for 19 cores when this non-preferred size is used.

NOTE 1 A centre filler may be used for other sizes.

NOTE 2 A tape may be applied around the core assembly before application of the sheath.

4.2.1.5 Sheath

The cores shall be covered with a sheath.

The sheath shall be made up as follows:

a) For cables with a specified sheath thickness up to and including 2,4 mm:

   1) sheath in a single layer, cross-linked compound type EM 8 to EN 50363-6.

b) For cables with a specified sheath thickness greater than 2,4 mm:

   1) either in a single layer, cross-linked compound type EM 8 to EN 50363-6;

   2) or in two layers, with the inner layer made of one of the cross-linked compounds type EM 8 or EM 10 to EN 50363-6 and the outer layer of the cross-linked compound type EM 8 to EN 50363-6.

The sheath in a single layer or the inner layer of the sheath in two layers shall fill the spaces between the cores. Where a tape of suitable material is applied around the core assembly (see NOTE 2 to 4.2.1.4) this requirement shall not apply, provided that the finished cables shall not have any substantial cavity in the outer interstices between the cores.

4.2.1.6 Marking

The cable shall be marked with the CENELEC code H07ZZ-F. The marking shall comply with Clause 6 of EN 50525-1.

4.2.2 Requirements

Each cable shall comply with the appropriate requirements given in EN 50525-1, and the particular requirements of this Part.

Testing shall be in accordance with Annex A.

The dimensions of the cables shall conform to Table B.2 for the relevant size.

The requirements to be met for the compatibility test shall be as given in Annex C.

When tested in accordance with the method and procedure given in EN 61034-2, all sizes of cable shall exceed 60 % light transmittance throughout the test.

Annex A
(normative)

Tests for cables to EN 50525-3-21

Table A.1

1	2	3	4	5
Ref No.	**Tests** [a]	**Category of test**	**Test method described in**	
			EN	**(Sub)clause**
1	**Electrical tests** [b]			
1.1	Resistance of conductors	T, S	50395	5
1.2	Voltage test on completed cable at 2 500 V	T, S	50395	6
1.3	Voltage test on cores at 2 500 V	T, S	50395	7
1.4	Insulation resistance at 90 °C	T	50395	8.1
1.5	Long term resistance of insulation to d.c.	T	50395	9
1.6	Absence of faults in insulation	R	50395	10
1.7	Surface resistance of sheath	T	50395	11
2	**Constructional and dimensional tests**			
2.1	Checking of compliance with constructional provisions	T, S	50525-1	Inspection and manual tests
2.2	Measurement of thickness of insulation	T, S	50396	4.1
2.3	Measurement of thickness of sheath	T, S	50396	4.2
2.4	Measurement of overall diameter			
2.4.1	Mean value	T, S	50396	4.4.1
2.4.2	Ovality	T, S	50396	4.4.2
2.5	Solderability test (plain conductors)	T	50396	8.2
3	**Insulation material tests**	T	50363-5 [c]	-
4	**Sheath material tests**	T	50363-6 [c d]	-
5	**Compatibility test**	T	60811-1-2	8.1.4
6	**Impact test** at - 5 °C	T	60811-1-4	8.5
7	**Mechanical strength of completed cable** [e]			
	Flexing test followed, after immersion in water, by a voltage test at 2 000 V on cores	T	50396 50395	6.2 7
8	**Tests under fire conditions**			
8.1	Test on single vertical cable	T	60332-1-2	-
8.2	Test on bunched cables	T	60332-3-24	-
8.3	Smoke emission	T	61034-2	
9	**Assessment of halogens for all non-metallic materials**	T, S	50525-1	Annex B

[a] The order given does not imply a sequence of testing.

[b] Particular test conditions and requirements are given in Table 1 of EN 50525-1.

[c] This EN includes all the test methods and requirements for the material. Material to be tested is taken from the finished cable.

[d] The requirement for resistance to ozone is not applicable to the inner layer of two layer sheath.

[e] Not applicable to cables with more than 18 cores laid up in more than two concentric layers.

Annex B
(normative)

General data

NOTE The overall dimensions of cables have been calculated in accordance with EN 60719.

Table B.1

1	2	3	4	5	6	7	8
Number and nominal cross sectional area of conductors	Thickness of insulation	Thickness of sheath			Mean overall diameter		Minimum insulation resistance at 90 °C
		Specified value			Lower limit	Upper limit	
	Specified value	One layer	Two layers				
			Inner layer	Outer layer			
mm^2	mm	mm	mm	mm	mm	mm	MΩ.km
1 x 1,5	0,8	1,4	-	-	5,7	7,1	0,012
1 x 2,5	0,9	1,4	-	-	6,3	7,9	0,010
1 x 4	1,0	1,5	-	-	7,2	9,0	0,009 4
1 x 6	1,0	1,6	-	-	7,9	9,8	0,008 1
1 x 10	1,2	1,8	-	-	9,5	11,9	0,007 6
1 x 16	1,2	1,9	-	-	10,8	13,4	0,006 2
1 x 25	1,4	2,0	-	-	12,7	15,8	0,005 8
1 x 35	1,4	2,2	-	-	14,3	17,9	0,004 9
1 x 50	1,6	2,4	-	-	16,5	20,6	0,004 8
1 x 70	1,6	2,6	1,0	1,6	18,6	23,3	0,004 1
1 x 95	1,8	2,8	1,1	1,7	20,8	26,0	0,004 0
1 x 120	1,8	3,0	1,2	1,8	22,8	28,6	0,003 6
1 x 150	2,0	3,2	1,3	1,9	25,2	31,4	0,003 6
1 x 185	2,2	3,4	1,4	2,0	27,6	34,4	0,003 6
1 x 240	2,4	3,5	1,4	2,1	30,6	38,3	0,003 4
1 x 300	2,6	3,6	1,4	2,2	33,5	41,9	0,003 3
1 x 400	2,8	3,8	1,5	2,3	37,4	46,8	0,003 1
1 x 500	3,0	4,0	1,6	2,4	41,3	52	0,003 0
1 x 630	3,0	4,1	1,6	2,5	45,5	57	0,002 6
2 x 1	0,8	1,3	-	-	7,7	10,0	0,013
2 x 1,5	0,8	1,5	-	-	8,5	11,0	0,012
2 x 2,5	0,9	1,7	-	-	10,2	13,1	0,010
2 x 4	1,0	1,8	-	-	11,8	15,1	0,009 4
2 x 6	1,0	2,0	-	-	13,1	16,8	0,008 1
2 x 10	1,2	3,1	1,2	1,9	17,7	22,6	0,007 6
2 x 16	1,2	3,3	1,3	2,0	20,2	25,7	0,006 2
2 x 25	1,4	3,6	1,4	2,2	24,3	30,7	0,005 8

Table B.1 *(continued)*

1	2	3	4	5	6	7	8
Number and nominal cross sectional area of conductors	**Thickness of insulation**	**Thickness of sheath**			**Mean overall diameter**		**Minimum insulation resistance at 90 °C**
		Specified value					
	Specified value	**One layer**	**Two layers**		**Lower limit**	**Upper limit**	
			Inner layer	**Outer layer**			
mm^2	mm	mm	mm	mm	mm	mm	MΩ.km
3 x 1	0,8	1,4	-	-	8,3	10,7	0,013
3 x 1,5	0,8	1,6	-	-	9,2	11,9	0,012
3 x 2,5	0,9	1,8	-	-	10,9	14,0	0,010
3 x 4	1,0	1,9	-	-	12,7	16,2	0,009 4
3 x 6	1,0	2,1	-	-	14,1	18,0	0,008 1
3 x 10	1,2	3,3	1,3	2,0	19,1	24,2	0,007 6
3 x 16	1,2	3,5	1,4	2,1	21,8	27,6	0,006 2
3 x 25	1,4	3,8	1,5	2,3	26,1	33,0	0,005 8
3 x 35	1,4	4,1	1,6	2,5	29,3	37,1	0,004 9
3 x 50	1,6	4,5	1,8	2,7	34,1	42,9	0,004 8
3 x 70	1,6	4,8	1,9	2,9	38,4	48,3	0,004 1
3 x 95	1,8	5,3	2,1	3,2	43,3	54	0,004 0
3 x 120	1,8	5,6	2,2	3,4	47,4	60	0,003 6
3 x 150	2,0	6,0	2,4	3,6	52	66	0,003 6
3 x 185	2,2	6,4	2,5	3,9	57	72	0,003 6
3 x 240	2,4	7,1	2,8	4,3	65	82	0,003 4
3 x 300	2,6	7,7	3,1	4,6	72	90	0,003 3
4 x 1	0,8	1,5	-	-	9,2	11,9	0,013
4 x 1,5	0,8	1,7	-	-	10,2	13,1	0,012
4 x 2,5	0,9	1,9	-	-	12,1	15,5	0,010
4 x 4	1,0	2,0	-	-	14,0	17,9	0,009 4
4 x 6	1,0	2,3	-	-	15,7	20,0	0,008 1
4 x 10	1,2	3,4	1,4	2,0	20,9	26,5	0,007 6
4 x 16	1,2	3,6	1,4	2,2	23,8	30,1	0,006 2
4 x 25	1,4	4,1	1,6	2,5	28,9	36,6	0,005 8
4 x 35	1,4	4,4	1,7	2,7	32,5	41,1	0,004 9
4 x 50	1,6	4,8	1,9	2,9	37,7	47,5	0,004 8
4 x 70	1,6	5,2	2,0	3,2	42,7	54	0,004 1
4 x 95	1,8	5,9	2,3	3,6	48,4	61	0,004 0
4 x 120	1,8	6,0	2,4	3,6	53	66	0,003 6
4 x 150	2,0	6,5	2,6	3,9	58	73	0,003 6
4 x 185	2,2	7,0	2,8	4,2	64	80	0,003 6
4 x 240	2,4	7,7	3,1	4,6	72	91	0,003 4
4 x 300	2,6	8,4	3,3	5,1	80	101	0,003 3

Table B.1 *(concluded)*

1	2	3	4	5	6	7	8
Number and nominal cross sectional area of conductors	**Thickness of insulation**	**Thickness of sheath**			**Mean overall diameter**		**Minimum insulation resistance at 90 °C**
		Specified value			**Lower limit**	**Upper limit**	
	Specified value	**One layer**	**Two layers**				
			Inner layer	**Outer layer**			
mm^2	mm	mm	mm	mm	mm	mm	MΩ.km
5 x 1	0,8	1,6	-	-	10,2	13,1	0,013
5 x 1,5	0,8	1,8	-	-	11,2	14,4	0,012
5 x 2,5	0,9	2,0	-	-	13,3	17,0	0,010
5 x 4	1,0	2,2	-	-	15,6	19,9	0,009 4
5 x 6	1,0	2,5	1,0	1,5	17,5	22,2	0,008 1
5 x 10	1,2	3,6	1,4	2,2	22,9	29,1	0,007 6
5 x 16	1,2	3,9	1,5	2,4	26,4	33,3	0,006 2
5 x 25	1,4	4,4	1,7	2,7	32,0	40,4	0,005 8

Table B.2

1	2	3	4	5	6	7	8
Number and nominal cross sectional area of conductors [a]	**Thickness of insulation**	**Thickness of sheath** [b c]			**Mean overall diameter**		**Minimum insulation resistance at 90 °C**
		Specified value			**Lower limit**	**Upper limit**	
	Specified value	**One layer**	**Two layers**				
			Inner layer	**Outer layer**			
mm^2	mm	mm	mm	mm	mm	mm	MΩ.km
6 x 1,5	0,8	2,5	1,0	1,5	13,4	17,2	0,012
7 x 1,5	0,8	2,6	1,0	1,6	14,7	18,7	0,012
12 x 1,5	0,8	2,9	1,2	1,7	17,6	22,4	0,012
18 x 1,5	0,8	3,2	1,3	1,9	20,7	26,3	0,012
24 x 1,5	0,8	3,5	1,4	2,1	24,3	30,7	0,012
36 x 1,5	0,8	3,8	1,5	2,3	27,8	35,2	0,012
6 x 2,5	0,9	2,7	1,1	1,6	15,7	20,0	0,010
7 x 2,5	0,9	2,8	1,1	1,7	17,1	21,8	0,010
12 x 2,5	0,9	3,1	1,2	1,9	20,6	26,2	0,010
18 x 2,5	0,9	3,5	1,4	2,1	24,4	30,9	0,010
24 x 2,5	0,9	3,9	1,6	2,3	28,8	36,4	0,010
36 x 2,5	0,9	4,3	1,7	2,6	33,2	41,8	0,010
6 x 4	1,0	2,9	1,2	1,7	18,2	23,2	0,009 4
7 x 4	1,0	3,1	1,2	1,9	20,1	25,5	0,009 4
12 x 4	1,0	3,5	1,4	2,1	24,4	30,9	0,009 4
18 x 4	1,0	3,9	1,6	2,3	28,8	36,4	0,009 4

[a] The number of cores given here is preferred.

[b] The sheath thicknesses (e_g) of the cables have been calculated by the fictitious calculation method according to IEC 60502-1:2004, Annex A, using the following formula:

$$e_g = 0,11\ D + 1,5\ mm$$

where D is the diameter over laid up cores.

[c] Where “non-preferred” numbers are manufactured, the sheath thickness, for one layer or for two layer constructions, shall be for the next highest preferred number of cores.

Annex C
(normative)

Requirements for compatibility test

C.1 Test conditions

The sample shall be aged for seven days at (100 ± 2) °C in accordance with the designated test method.

C.2 Requirements

At the conclusion of the ageing period the insulation and sheath shall meet the requirements given in Table C.1 below.

Table C.1 − Requirements

Parameter		Units	Insulation EI 8	Sheath EM 8/EM 10
Tensile strength	- median, min.	N/mm^2	-	-
	- variation [a], max.	%	± 30	- 30 [b]
Elongation at break	- median, min.	%	-	100
	- variation [a], max.	%	± 30	± 30

[a] The variation is the difference between the respective values obtained prior to and after heat treatment, expressed as a percentage of the former.

[b] No limit for the positive tolerance.

Bibliography

EN 60719		Calculation of the lower and upper limits for the average outer dimensions of cables with circular copper conductors and of rated voltages up to and including 450/750 V (IEC 60719)
EN 60811-2-1		Insulating and sheathing materials of electric and optical cables - Common test methods - Part 2-1: Methods specific to elastomeric compounds - Ozone resistance, hot set and mineral oil immersion tests (IEC 60811-2-1)
HD 516		Guide to use of low voltage harmonized cables
IEC 60502-1	2004	Power cables with extruded insulation and their accessories for rated voltages from 1 kV (Um = 1,2 kV) up to 30 kV (Um = 36 kV) - Part 1: Cables for rated voltages of 1 kV (Um = 1,2 kV) and 3 kV (Um = 3,6 kV)

National Annex (informative) **Origins and identification of the particular cable types**

As an aid to users, the table below shows, in respect of BS EN 50525-3-21:

— the identification of the particular cable types from BS 7919 that are now included in BS EN 50525-3-21;

— the location of the cables within BS EN 50525-3-21;

— any applicable United Kingdom and CENELEC cable codings (see also National Informative Annex B to BS EN 50525-1).

Pre-existing BS		**Clause in BS EN 50525-3-21**	**Cable type – Coding**	
Number	**Table**		**United Kingdom (if applicable)**	**CENELEC**
BS 7919	18	4.1	–	H07ZZ-F
BS 7919	19	4.2	–	H07ZZ-F

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