

Specification for

Flexible cables for use at mines and quarries

Cables flexibles utilisables en mines et
carrières — Spécifications

Elektrische Kabel für den Einsatz im
Steinbruch und Bergbau

Committees responsible for this British Standard

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- British Aggregate Construction Materials Industries
- British Cable Makers' Confederation
- British Coal Corporation
- China Clay Association
- Health and Safety Executive

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Foreword

This British Standard has been prepared under the direction of the Mining Requisites Standards Policy Committee. It combines the revisions of BS 6708 : 1977 and BS 6116 : 1970 which are now withdrawn.

As previously, British Coal specifications continue to form the basis for much of this standard. However, a significant part of the standard is now concerned with cables for quarries and miscellaneous mines. Besides those formerly contained in BS 6116, cable types added for this revision include flat cable (FS4) in section 2, multicore auxiliary cables (506, 512, 518 and 524) forming section 4; type 630 screened and armoured three core cable of 3800/6600 V rating in section 5; non-armoured cable of 3800/6600 V rating (type 730) forming section 8; and 6350/11 000 V rating (type 830) forming section 9. In this revision, the cable types have been rationalized and this standard now contains only those cable types considered to reflect current usage.

All matters relating to the use of electric cables in mines and quarries are now included in the Electricity at Work Regulations 1989 and the associated Health and Safety Executive (HSE) Approved Codes of Practice, i.e. *The use of electricity in mines* (COP 34) and *The use of electricity at quarries* (COP 35).

Compliance with a British Standard does not of itself confer immunity from legal obligations. Attention is drawn to the Health and Safety at Work etc. Act 1974, the Mines and Quarries Act 1954, the Regulations made under these Acts, and also any other appropriate statutory requirements or bye-laws. These place responsibility for complying with certain specific safety requirements on the manufacturer and the user. The address of the recognized certification authority in the UK for Group I (coal mining) apparatus for flameproof purposes is as follows.

Health and Safety Executive
HSE(M) Certification Support Service
Harpur Hill
Buxton
Derbyshire SK17 9JN

Section 1. General

1 Scope

This British Standard specifies requirements and dimensions for flexible cables used in mining and quarrying. It comprises nine sections; section 1 deals with general matters and sections 2 to 9 cover specific types of cables as follows:

Section 2. Non-armoured cables having individually metallic screened cores and a rated voltage of 640/1100 V for use:

- (a) with coalface cutters and other similar machines: types 7, 7M, 7S, 11, 14 and 16;
- (b) on overhead catenary systems and similar applications: type FS4 (flat form cable);

Section 3. Cables with galvanized steel pliable wire armouring having:

- (1) unscreened cores and a rated voltage 320/550 V: types 20 and 21; or
- (2) individually metallic screened or unscreened cores and a rated voltage 640/1100 V used primarily for remote control circuits and coalface lighting: types 62, 63, 64, 70 and 71; or
- (3) individually metallic screened cores and a rated voltage 640/1100 V: types 201 and 211; or
- (4) a rated voltage 1900/3300 V used as trailing cables in quarries or for mine roadway cable extension purposes: types 321 and 331;

Section 4. Auxiliary cables with galvanized steel pliable wire armouring having up to 24 individually metallic screened cores and a rated voltage 320/550 V primarily for use on large mining machines where interconnection between machine sections or a machine section and auxiliary equipment is required: types 506, 512, 518 and 524;

Section 5. Cables with galvanized steel pliable wire armouring having individually metallic screened or unscreened cores and a rated voltage 3800/6600 V used as trailing cables in quarries and rated for roadway extension purposes: types 621, 630 and 631;

Section 6. Non-armoured cable having individually metallic screened cores and a rated voltage 600/1000 V, primarily for use with hand-held drilling machines in mines: type 44;

Section 7. Non-armoured cable having individually non-metallic screened cores and a rated voltage 600/1000 V, primarily for use with hand-held drilling machines in mines: type 43;

Section 8. Non-armoured cable having individually metallic screened cores and a rated voltage 3800/6600 V, primarily for use as trailing cables for large machines at quarries: type 730;

Section 9. Non-armoured cable having individually metallic screened cores and a rated voltage 6350/11 000 V, primarily for use as trailing cables for large machines at quarries: type 830.

Recommended current ratings are given in appendix A.

Short circuit current carrying capability of flexible cable screens is given in appendix B.

NOTE. The titles of the publications referred to in this standard are listed on the inside back cover.

2 Definitions

For the purposes of this British Standard, the definitions given in BS 4727 apply, together with the following.

NOTE. Unless otherwise specified, voltages and currents are expressed by their r.m.s. values.

2.1 rated voltage U_0

The power-frequency voltage to earth for which the cable is designed.

NOTE. It may be assumed that cables may be operated continuously at a power-frequency voltage 10 % above the rated voltage.

2.2 rated voltage U

The power-frequency voltage between conductors for which the cable is designed.

NOTE. It may be assumed that cables may be operated continuously at a power-frequency voltage 10 % above the rated voltage.

2.3 flexible cable

A cable designed to be moved while energized.

2.4 trailing cable

A cable used to supply apparatus which changes its position while energized.

2.5 fixed cable

A cable which does not change its position whilst in use while energized.

2.6 stranded conductor

A conductor made up of a number of wires twisted together.

NOTE. When the conductor consists of more than one layer, alternate layers are twisted in opposite directions.

2.7 bunched conductor

A stranded conductor in which all wires are twisted together in the same direction and with the same lay throughout.

2.8 multiple stranded conductor

A stranded conductor consisting of a number of groups of wires assembled together in one or more helical layers, the wires in each group being either bunched or stranded.

2.9 braid

A plaited protective covering composed of a number of wires.

2.10 metallic screen

A braid which encloses the insulation of each conductor.

2.11 non-metallic screen

A conducting layer which encloses the insulation of each conductor.

2.12 core

A single conductor with its insulation, but not including any mechanical protective cover.

3 Abbreviations

The following abbreviations are used in this standard.

PCP polychloroprene

ETFE ethylenetetrafluoroethylene

4 Voltage designation

The cable shall be designated by the rated voltages U_0 and U expressed in the form U_0/U .

NOTE. The rated voltages recognized for the purposes of this British Standard are 320/550 V, 600/1000 V, 640/1100 V, 1900/3300 V, 3800/6600 V and 6350/11 000 V.

Section 2. Cables with individual metallic screens, rated voltage 640/1100 V, for use with coalcutters and for similar purposes (types 7, 7M, 7S, 11, 14 and 16) and flat cables for use on overhead catenary systems and for similar purposes (type FS4)

5 Types of cable

NOTE. The cables covered in this section of BS 6708 are types 7, 7M, 7S, 11, 14, 16 and FS4 as given in table 1.

Constructional details and dimensions shall be as given in tables 2 to 8.

6 Conductors

The conductors shall be composed of round tinned annealed copper wires complying with BS 6360 and shall be multiple stranded for conductors of 16 mm² and larger. Sizes below 16 mm² shall be bunched.

Joints made in the single wires forming the conductor shall be brazed, silver soldered or electrically welded. No joint shall be made in the conductor after it has been stranded.

The nominal number and nominal and maximum diameter of the wires in the conductor shall be as given in tables 2 to 8.

NOTE. At the manufacturer's discretion, a film separator of polyethylene terephthalate or other suitable non-hygroscopic tape may be applied over the conductor. Embrittlement or discolouration of this tape after vulcanization of the core may be disregarded.

7 Insulation

The core insulation shall be a close fit on the conductor without adhering, and shall be either type FR1 or type GP4 compound complying with BS 6899.

For type 7 and type 14 cables, an additional layer of insulation shall be applied to the earth core and to the pilot core of a thickness such that the finished outside diameters of the cores are the same as that of a screened power core. The additional layer of insulation on the pilot conductor shall be readily separable from the primary insulation.

NOTE 1. For the earth core, the additional layer of insulation may be separable from the primary insulation or, alternatively, the insulation may be applied in a homogeneous layer.

NOTE 2. Where insulation colouring is used for identification purposes, it may be restricted to the outer layer.

8 Thickness of insulation

The radial thickness of core insulation shall be determined in accordance with the method

described in appendix C, and the average value shall be not less than the nominal value given in tables 2 to 8. The smallest of the measured values shall not fall below the nominal value by more than 0.1 mm plus 10 % of the nominal value.

9 Core tape

The insulation of each conductor or sheathed pilot unit shall be lapped with a 0.15 mm thick tape of closely woven textile, without selvage, proofed on one side with rubber or comparable material. The tape shall be applied with an overlap. The proofed side of the tape shall be coloured for identification purposes (see clause 10) and shall be on the outside.

10 Core identification

10.1 General

The core tapes required by clause 9 shall be coloured for identification purposes as follows:

power cores:	red, yellow and brown;
pilot core (except type 7S, see 10.2):	blue;
earth core(s):	green/yellow.

10.2 Type 7S pilot unit and pilot cores

The pilot unit core tape required by clause 9 shall be coloured blue.

The pilot cores shall be identified either by the application of a coloured core tape in accordance with clause 9 or by the colour of the insulation in accordance with clause 7. The identifying colours shall be black, white and blue.

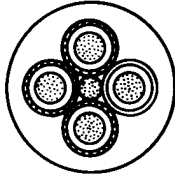
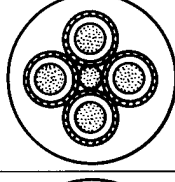
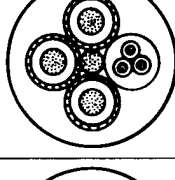
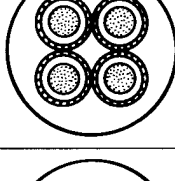
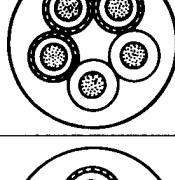
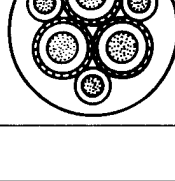
11 Protective screen

The form of screen, method of application and materials shall be as given in appendix D.

12 Central filler

For types 11, 14 and 16 the cores shall be laid around a centre of elastomeric compound which may include a textile carrier.

Table 1. Section 2 cable types and construction

Type	System	Construction	Sectional diagram
7	3 phase	5-core. Three power cores each having a protective metallic screen and one pilot core unscreened, laid around a bare earth conductor with which the screens are in electrical contact, sheathed overall	
7M	3 phase	5-core. Three power cores and one pilot core having the same nominal cross-sectional area, each having a protective metallic screen, laid around a bare earth conductor which the screens are in electrical contact, sheathed overall	
7S	3 phase	7-core. Three power cores each having a protective metallic screen, and one unscreened sheathed pilot unit containing three pilot cores, laid around a bare earth conductor with which the screens are in electrical contact, sheathed overall	
11	3 phase	4-core. Three power cores and one pilot core having the same nominal cross-sectional area, each having a protective metallic screen, laid around an elastomeric centre, sheathed overall. The combined screens shall function as the cable earth conductor	
14	3 phase	5-core. Three power cores each having a protective metallic screen, one unscreened earth core and one unscreened pilot core, laid around an elastomeric centre, sheathed overall	
16	3 phase	6-core. Three power cores each having a protective metallic screen, one unscreened pilot core and two unscreened earth cores. The power cores laid around an elastomeric centre with the pilot and earth cores in the interstices, sheathed overall	
FS4	3 phase	4-core. Three power cores and one neutral core each having a protective screen, laid flat, sheathed overall	

13 Laying-up of cores

13.1 Types 7 and 7M

The cores shall be laid around a bare earth conductor with a length of lay which permits the screens enclosing each power core to make electrical contact with the bare central earth conductor without deforming it. The lay of the earth conductor strands shall be in the same direction as that of the laid up cores, i.e. right hand.

13.2 Type 7S

The three pilot cores of the pilot unit shall be laid up with a right hand direction of lay with the length of lay not exceeding nine times the pitch circle diameter.

The power cores and pilot unit shall be laid around a bare earth conductor with a length of lay which permits the screens enclosing each power core to make electrical contact with the bare central earth conductor without deforming it.

13.3 Types 11 and 14

The cores shall be laid around an elastomeric compound centre.

13.4 Type 16

The power cores shall be laid around an elastomeric compound centre with the pilot and two earth cores laid up in the interstices of the power cores.

13.5 Length and direction of lay

The cores of all types of cable, with the exception of type FS4 and the pilot cores of cable type 7S (see 13.2), shall be laid up with a right hand direction of lay with the length of lay not exceeding the following:

- (a) 15 times the pitch circle diameter for conductors of cross-sectional area up to and including 25 mm²;
- (b) 18 times the pitch circle diameter for conductors of cross-sectional area greater than 25 mm².

The cores of type FS4 shall be laid parallel in flat configuration.

13.6 Sequence of colours

The laid up cores shall be in the following sequence:

cable type 7:	red, yellow, brown (power); blue (pilot);
cable type 7M:	red, yellow, brown (power); blue (pilot);

cable type 7S:	red, yellow, brown (power); blue (pilot unit);
cable type 11:	red, yellow, brown (power); blue (pilot);
cable type 14:	red, yellow, brown (power); green/yellow (earth); blue (pilot);
cable type 16:	red, yellow, brown (power); with green/yellow (earth - two in number); blue (pilot); one in each interstice, i.e. red, green/yellow, yellow, blue, brown, green/yellow,
cable type FS4:	red, yellow, brown, blue.

14 Sheath of pilot unit and outer sheath

14.1 Sheath of pilot unit (type 7S)

The assembled cores of the pilot unit shall be sheathed with a black compound complying with the requirements of BS 6899 for a type EM2 sheath. The sheath shall be of such thickness that the diameter of the taped sheath is the same as that of a screened power core.

14.2 Outer sheath

The assembled cores shall be filled and sheathed in one operation with a compound complying with the requirements of BS 6899 for a type RS2 sheath, except that the minimum tear strength shall be 7.5 N/mm.

NOTE. Where no colour is specified in the purchase order, black sheaths will normally be supplied.

The radial thickness of the outer sheath shall be determined in accordance with the method given in appendix C, and the average value shall be not less than the nominal value given in tables 2 to 8. The smallest of the measured values shall not fall below the nominal value by more than 0.1 mm plus 15 % of the nominal value.

15 Marking

15.1 All cables shall be durably and legibly marked with the manufacturer's name, together with the year and month of manufacture, on rubber-proofed or other comparable non-hygroscopic tape or tapes inside the cable. The marking shall be at intervals of not more than 300 mm throughout the length of the cable.

NOTE. The month may be indicated by number.

15.2 Type 7S cable shall have, in addition, an external identifying mark in the form of a blue stripe not less than 12 mm wide applied longitudinally along the cable.

NOTE. At the manufacturer's option, the stripe material may be the same as that of the outer sheath, or a similar material compatible with it.

16 Tests on cores

16.1 General

All cores shall be subjected, at the manufacturer's works, to the spark test in **16.2**. They shall also be capable of meeting the voltage test specified in **16.3** and the insulation resistance test specified in **16.4**.

16.2 Spark test

Cores shall be tested in accordance with the method given in BS 5099, and shall withstand the appropriate test voltage in clause 4 of BS 5099 : 1974.

16.3 Voltage test

When cores are tested in accordance with the method given in **E.1**, **E.2.1** and **E.2.2**, they shall withstand a test voltage of 3000 V, with the exception of the earth and pilot cores in type 16 which shall withstand 1500 V, and the pilot cores in type 7S which shall withstand 2500 V.

16.4 Insulation resistance

When cores are tested in accordance with the method given in **E.1**, **E.2.1** and **E.2.3**, the insulation resistance between the conductor and the water in which the core is immersed shall be not less than the appropriate value given in table 9.

17 Tests on completed cable

17.1 Conductor resistance

The d.c. resistance at 20 °C shall not exceed the appropriate value given in tables 2 to 8.

17.2 Resistance of earth conductor and screens

For types 7, 7M and 7S, the combined d.c. resistance of the earth conductor and the core screens in parallel at 20 °C shall not exceed the appropriate value given in tables 2 to 4. For types 11, 14, 16 and FS4, the d.c. resistance of the core screens in parallel at 20 °C shall not exceed the appropriate value given in tables 5 to 8.

17.3 Voltage test

All completed cables shall be subjected to the voltage test in accordance with **E.1** and **E.3.1**. All cores shall withstand a test voltage of 3000 V, with the exception of the earth and pilot cores in type 16 which shall withstand 1500 V, and the pilot cores in type 7S which shall withstand 2500 V.

17.4 Insulation resistance

Immediately after the completion of the voltage test (see **17.3**), the insulation resistance of all cores shall be measured in accordance with **E.1** and **E.3.2**. The insulation resistance shall be not less than the appropriate value given in table 9.

Table 2. Constructional details of type 7 cable

	16	25	35	50	70	95	120
Nominal cross-sectional area of conductor, mm ²	16	25	35	50	70	95	120
Nominal number and nominal diameter of wires in conductor, mm	16 16 16	16 16 16	16 16 16	25 25 25	35 35 35	50 50 50	60 60 60
Maximum diameter of wires in conductor, mm	16/0.40 16/0.40 16/0.40	16/0.40 16/0.40 16/0.40	16/0.40 16/0.40 16/0.40	25/0.40 25/0.40 25/0.40	35/0.40 35/0.40 35/0.40	50/0.40 50/0.40 50/0.40	60/0.40 60/0.40 60/0.40
Radial thickness of core insulation, mm	0.41	0.41	0.41	0.41	0.41	0.41	0.41
Radial thickness of outer sheath, mm	1.5	1.6	1.6	1.7	1.8	2.0	2.2
Overall diameter of cable, mm	15	15	15	16	16	17	18
Minimum	35.8	39.7	43.1	48.5	55.1	62.4	68.0
Maximum	38.6	42.9	46.3	51.8	58.8	66.1	72.5
Maximum conductor resistance per 1000 m of cable at 20 °C, ohm	1.24	0.795	0.565	0.393	0.277	0.210	0.164
Maximum screen resistance per 1000 m of cable at 20 °C, ohm	1.24	1.24	1.24	0.795	0.565	0.393	0.277
Cross-sectional area of earths and screens, mm ²	0.66	0.56	0.54	0.44	0.30	0.26	0.24
Area of earth and screens, expressed as a percentage of the area of the largest current carrying conductor	41.4	41.4	43.4	58	68	100	100
	258	165	124	116	97	106	83

1) See 13.1.

2) See clause 7.



Table 3. Constructional details of type 7M cable

	16	25	35	50	70	95	120
Nominal cross-sectional area of conductor, mm ²	16	25	35	50	70	95	120
Nominal number and nominal diameter of wires in conductor, mm	16	16	18	25	35	50	50
Maximum diameter of wires in conductor, mm	16	16	18	25	35	50	50
Radial thickness of core insulation, mm	126/0.40	196/0.40	276/0.40	396/0.40	360/0.50	475/0.50	608/0.50
Radial thickness of outer sheath, mm	126/0.40	126/0.40	147/0.40	196/0.40	276/0.40	396/0.40	396/0.40
Overall diameter of cable, mm	126/0.40	196/0.40	276/0.40	396/0.40	360/0.50	475/0.50	608/0.50
Minimum	0.41	0.41	0.41	0.41	0.51	0.51	0.51
Maximum	0.41	0.41	0.41	0.41	0.51	0.51	0.51
Maximum conductor resistance per 1000 m of cable at 20 °C, ohm	1.5	1.6	1.6	1.7	1.8	2.0	2.2
Maximum screen resistance per 1000 m at 20 °C, ohm	1.5	1.6	1.6	1.7	1.8	2.0	2.2
Cross-sectional area of earth and screens, mm ²	5.0	5.0	5.0	5.3	5.8	6.4	6.9
Area of earth and screens, expressed as a percentage of the area of the largest current carrying conductor	35.8	39.7	43.1	48.5	55.1	62.4	68.0
	38.6	42.9	46.3	51.8	58.8	66.1	72.5
	1.24	0.795	0.565	0.393	0.277	0.210	0.164
	1.24	0.795	0.565	0.393	0.277	0.210	0.164
	0.58	0.47	0.45	0.38	0.27	0.23	0.21
	49.9	49.9	62.1	69.1	85.9	117.9	117.9
	321	200	177	138	123	124	98

1) See 13.1.

Table 4. Constructional details of type 7S cable

Nominal cross-sectional area of conductor, mm ²	power earth pilot	50 25 4	70 35 6	95 50 6	120 50 10
Nominal number and nominal diameter of wires in conductor, mm	power earth pilot	396/0.40 196/0.40 56/0.30	360/0.50 276/0.40 84/0.30	475/0.50 396/0.40 84/0.30	608/0.50 396/0.40 80/0.40
Maximum diameter of wires in conductor, mm	power earth pilot	0.41 0.41 0.31	0.51 0.41 0.31	0.51 0.41 0.31	0.51 0.41 0.41
Radial thickness of core insulation, mm	power pilot	1.7 1.4	1.8 1.5	2.0 1.5	2.2 1.5
Radial thickness of outer sheath, mm		5.3	5.8	6.4	6.9
Overall diameter of cable, mm					
minimum		48.5	55.1	62.4	68.0
maximum		51.8	58.8	66.1	72.5
Maximum conductor resistance per 1000 m of cable at 20 °C, ohm	power pilot	0.393 5.47	0.277 3.60	0.210 3.60	0.164 2.09
Maximum screen resistance per 1000 m at 20 °C, ohm	3 screens plus earth conductor in parallel	0.44	0.30	0.26	0.24
Cross-sectional area of earth and screens, mm ²	3 screens plus earth conductor in parallel	58	68	100	100
Area of earth and screens, expressed as a percentage of the largest current carrying conductor	3 screens plus earth conductor in parallel	116	97.1	105	83.3

Table 5. Constructional details of type 11 cable

Nominal cross-sectional area of conductor, mm ²	power	16
	pilot	16
Nominal number and nominal diameter of wires in conductor, mm	power	126/0.40
	pilot	126/0.40
Maximum diameter of wires in conductor, mm	power	0.41
	pilot	0.41
Radial thickness of core insulation, mm	power	1.5
	pilot	1.5
Radial thickness of outer sheath, mm		3.0
Overall diameter of cable, mm		
minimum		30.9
maximum		33.0
Maximum conductor resistance per 1000 m of cable at 20 °C, ohm	power	1.24
	pilot	1.24
Maximum conductor resistance per 1000 m of cable at 20 °C, ohm	4 screens in parallel	1.05
Cross-sectional area of screens, mm ²	4 screens in parallel	33.9
Area of screens, expressed as a percentage of the area of the largest current carrying conductor	4 screens in parallel	211

Table 6. Constructional details of type 14 cable

Nominal cross-sectional area of conductor, mm ²	power and earth pilot	25 16	35 16	50 25	70 35	95 50
Nominal number and nominal diameter of wires in conductor, mm	power and earth pilot	196/0.40 126/0.40	276/0.40 126/0.40	396/0.40 196/0.40	360/0.50 276/0.40	475/0.50 396/0.40
Maximum diameter of wires in conductor, mm	power and earth pilot	0.41 0.41	0.41 0.41	0.41 0.41	0.51 0.41	0.51 0.41
Radial thickness of core insulation, mm	power and earth pilot ¹⁾	1.6 1.5	1.6 1.5	1.7 1.6	1.8 1.6	2.0 1.7
Radial thickness of outer sheath, mm		5.0	5.2	5.7	6.3	7.0
Overall diameter of cable, mm						
minimum		43.2	47.3	53.7	61.2	69.3
maximum		46.6	50.7	57.6	65.0	73.9
Maximum conductor resistance per 1000 m of cable at 20 °C, ohm	power and earth pilot	0.795 1.24	0.565 1.24	0.393 0.795	0.277 0.565	0.210 0.393
Maximum screen resistance per 1000 m of cable at 20 °C, ohm	3 screens in parallel	1.10	1.20	1.40	0.70	0.85
Cross-sectional area of screens, mm ²	3 screens in parallel	25.4	25.4	33	35	50.7
Area of screens, expressed as a percentage of the area of the largest current carrying conductor	3 screens in parallel	101	72	66	50	53

¹⁾ See clause 7.

Table 7. Constructional details of type 16 cable

Nominal cross-sectional area of conductor, mm ²	power earth (2) and pilot	25 10	35 10	50 16	70 25	95 35
Nominal number and nominal diameter of wires in conductor, mm	power earth and pilot	196/0.40 80/0.40	276/0.40 80/0.40	396/0.40 126/0.40	360/0.50 196/0.40	475/0.50 276/0.40
Maximum diameter of wires in conductor, mm	power earth and pilot	0.41 0.41	0.41 0.41	0.41 0.41	0.51 0.41	0.51 0.41
Radial thickness of core insulation, mm	power earth and power	1.6 1.0	1.6 1.0	1.7 1.0	1.8 1.0	2.0 1.0
Radial thickness of outer sheath, mm		5.0	5.0	5.0	5.4	6.0
Overall diameter of cable, mm						
minimum		36.5	39.5	43.9	49.6	56.2
maximum		39.2	42.7	47.0	53.3	63.0
Maximum conductor resistance per 1000 m of cable at 20 °C, ohm	power earth and pilot	0.795 1.95	0.565 1.95	0.393 0.24	0.277 0.795	0.210 0.565
Maximum screen resistance per 1000 m of cable at 20 °C, ohm	3 screens in parallel	1.10	1.20	1.40	0.70	0.85
Cross-sectional area of screens, mm ²	3 screens in parallel	25.4	25.4	33	35	50.7
Area of screens, expressed as a percentage of the area of the largest current carrying conductor	3 screens in parallel	101	72	66	50	53

Table 8. Constructional details of type FS4 cable

Nominal cross-sectional area of conductor, mm ²	power and neutral	2.5	4	6	10	16	25
Nominal number and nominal diameter of wires in conductor, mm	power and neutral	50/0.25	56/0.30	84/0.30	80/0.40	126/0.40	196/0.40
Maximum diameter of wires in conductor, mm	power and neutral	0.26	0.31	0.31	0.41	0.41	0.41
Radial thickness of core insulation, mm	power and neutral	1.0	1.0	1.0	1.5	1.5	1.5
Nominal diameter of wires in screen, mm	power and neutral	0.2	0.2	0.2	0.3	0.3	0.3
Number of cores		4	4	4	4	4	4
Radial thickness of outer sheath		3.8	3.8	3.8	3.8	4.1	4.4
Minimum overall dimension of cable, mm							
major		18.1	32.2	34.8	45.6	52.2	59.2
minor		12.4	13.3	14.4	17.1	19.2	21.4
Maximum overall dimension of cable, mm							
major		20.1	34.1	36.8	48.1	55.2	62.2
minor		14.4	15.3	16.4	19.6	22.2	24.4
Maximum conductor resistance per 1000 m of cable at 20 °C, ohm	power and neutral	7.82	4.85	3.23	1.85	1.18	0.757
Maximum resistance per 1000 m of cable at 20 °C, ohm	4 screens in parallel	1.85	2.12	2.34	0.92	1.08	0.75
Cross-sectional area of screens, mm ²	4 screens in parallel	10.6	9.15	8.28	20.1	17.5	25.2
Area of screens, expressed as a percentage of the largest current carrying conductor	4 screens in parallel	424	229	138	201	109	101