



LOW VOLTAGE CABLES

BUILDING WIRE

- Single core non-sheathed
H05V-U · H05V-K
H07V-U · H07V-R · H07V-K
- Single core non-sheathed, Fire retardant, Halogen free
H07Z1-K
- Single and multicore sheathed
H05VV-F · 05VV-F

UTILITY AND INDUSTRIAL CABLES

Unarmoured

- Standard
CU or AL / XLPE / PVC
- Fire retardant, Halogen free
CU or AL / XLPE / LSHF
- Fire resistant, Halogen free
CU / MICA / XLPE / LSHF
CU / SI / LSHF
- Control unscreened
CU / PVC / PVC
CU / XLPE / PVC
- Screened
CU / XLPE / CU / PVC or LSHF
- Concentric conductor
CU / XLPE / CU / PVC
CNE · SNE
Branchement

Armoured

- Standard
CU or AL / XLPE / STA or SWA / PVC
- Fire retardant, Halogen free
CU or AL / XLPE / STA or SWA / LSHF

Overhead Aerial cables

CU or AL / XLPE

LOW VOLTAGE CABLE

APPLICATION

Single core insulated conductor, without sheath, for general purposes, and rated voltages up to 300/500 V. Suitable for installation in surface mounted or embedded conduits, only for signalling or control circuits. Recommended fixed protected installation inside appliances and in, or on, lighting fittings.

CABLE DESIGNATION

Cu / PVC: H05V-U • H05V-K

CONSTRUCTION CHARACTERISTICS

Conductor

Copper (plain annealed): Solid class 1: (H05V-U)

Flexible class 5: (H05V-K)

Insulation

PVC – (Polyvinyl chloride), type TI 1.

COLOUR AND CABLE MARKING

Black • Blue • Brown • Grey • Orange • Pink • Red • Turquoise • Violet • White • Green • Yellow.

Bi-colours of any combination of the above mono-colours are permitted.

Oversheath marked at regular intervals with the following information:

<CERTIF> <HAR> CABELTE H05V-U (K)

GENERAL CHARACTERISTICS

Construction and test standards	IEC 60228 HD 21.3
Rated voltage U_0/U	300/500 V
Test voltage	2 000 V a.c. 5 minutes
Conductor maximum operating temperature	70°C
Maximum short-circuit temperature	160°C ($t \leq 5s$)
Minimum bending radius (mm)	H05V-U 4 x d H05V-K 3 x d
Maximum pulling force over conductor (N)	H05V-U 50 x S H05V-K 15 x S
Flame retardant	IEC 60332-1-2 • EN 60332-1-2 (cable vertically mounted, length of charred cable ≤ 540 mm).

S – conductor cross-section (mm²)

d – cable outer diameter (mm)

ELECTRICAL AND DIMENSIONAL CHARACTERISTICS

Cable composition n.º cond. x cross-section (mm²)	Approximate outer diameter (mm)	Approximate weight (kg/km)	Current carrying capacity in open air T = 30° C 2 or 3 charged conductors (A)
H05V-U			
1 x 0,5	2,1	10	3
1 x 0,75	2,3	13	6
1 x 1	2,4	15	10
H05V-K			
1 x 0,5	2,2	10	3
1 x 0,75	2,5	13	6
1 x 1	2,6	15	10

LOW VOLTAGE CABLE

APPLICATION

Single core insulated conductor, without sheath, for general purposes. Suitable for fixed protected installation in, or on, lighting or controlgear for rated voltages up to 450/750 V. Installation in surface mounted or embedded conduits, or similar closed systems.

Extra sliding cable.

CABLE DESIGNATION

Cu / PVC: H07V-U • H07V-R • H07V-K

CONSTRUCTION CHARACTERISTICS

Conductor

Copper (plain annealed): Solid class 1: (H07V-U)

Rigid stranded class 2: (H07V-R)

Flexible class 5: (H07V-K)

Insulation

PVC (Polyvinyl chloride), type TI 1.

COLOUR AND CABLE MARKING

Black • Blue • Brown • Grey • Orange • Pink • Red • Turquoise • Violet • White.

Bi-colours not used except the combination of the mono-colours green and yellow.

Oversheath marked at regular intervals with the following information:

<CERTIF> <HAR> CABELTE H07V-U (R) (K)

GENERAL CHARACTERISTICS

Construction and test standards	IEC 60228 HD 21.3
Rated voltage U_0/U	450/750 V
Test voltage	2 500 V a.c. 5 minutes
Conductor maximum operating temperature	70°C
Maximum short-circuit temperature	160°C ($t \leq 5s$)
Minimum bending radius (mm)	H07V-U (R) $4 \times d$ if $d \leq 8$ • $5 \times d$ if $8 < d \leq 12$ • $6 \times d$ if $d > 12$ H07V-K $3 \times d$ if $d \leq 12$ • $4 \times d$ if $d > 12$
Maximum pulling force over conductor (N)	H07V-U (R) $50 \times S$ H07V-K $15 \times S$ recommended not to exceed 1000 N
Flame retardant	IEC 60332-1-2 • EN 60332-1-2 (cable vertically mounted, length of charred cable ≤ 540 mm)

S – conductor cross-section (mm²)

d – cable outer diameter (mm)



ELECTRICAL AND DIMENSIONAL CHARACTERISTICS

Cable composition n.º cond. x cross-section (mm²)	Approximate outer diameter (mm)	Approximate weight (kg/km)	Current carrying capacity One circuit inside embedded conduits T = 30°C (A)	
			2 charged conductors	3 charged conductors
H07V-U				
1 x 1,5	3,0	20	17,5	15,5
1 x 2,5	3,5	30	24	21
1 x 4	4,0	45	32	28
1 x 6	4,5	65	41	36
H07V-R				
1 x 1,5	3,5	20	17,5	15,5
1 x 2,5	4,0	35	24	21
1 x 4	4,5	50	32	28
1 x 6	5,0	70	41	36
1 x 10	6,5	110	57	50
1 x 16	7,5	180	76	68
1 x 25	9,0	265	101	89
1 x 35	10,0	350	125	110
1 x 50	11,5	490	151	134
1 x 70	13,5	695	192	171
1 x 95	15,5	960	232	207
1 x 120	17,0	1 200	269	239
1 x 150	19,0	1 450		
1 x 185	21,0	1 845		
1 x 240	24,0	2 405		
1 x 300	26,5	3 045		
1 x 400	30,0	3 845		
H07V-K				
1 x 1,5	3,0	20	17,5	15,5
1 x 2,5	3,7	35	24	21
1 x 4	4,2	50	32	28
1 x 6	5,5	70	41	36
1 x 10	6,5	110	57	50
1 x 16	8,5	175	76	68
1 x 25	9,5	255	101	89
1 x 35	11,0	350	125	110
1 x 50	13,5	515	151	134
1 x 70	15,0	675	192	171
1 x 95	16,5	890	232	207
1 x 120	18,5	1 145	269	239
1 x 150	20,5	1 420		
1 x 185	22,5	1 715		
1 x 240	29,0	2 310		

Other compositions are available, contact inform@cabelte.pt for information.
Only one circuit is considered.

LOW VOLTAGE CABLE

APPLICATION

Single core, fire-proof, high security cable, insulated with thermoplastic halogen-free compound. Recommended for indoor use, fixed installations, in public areas such as hospitals, hotels, shopping malls, halls, computer and communication centres and, in general, in all places with large number of people and electrical/electronic equipment.

CABLE DESIGNATION

Cu / PVC: H07Z1-K

CONSTRUCTION CHARACTERISTICS

Conductor

Copper (plain annealed): Flexible class 5.

Insulation

LSHF – Low Smoke Halogen Free thermoplastic compound, fire retardant, type TI 7.

COLOUR AND CABLE MARKING

Black • Blue • Brown • Grey • Orange • Pink • Red • Turquoise • Violet • White.

Bi-colours not used except the combination of the mono-colours green and yellow.

Oversheath marked at regular intervals with the following information:

<CERTIF> <HAR> CABELTE H07Z1-K TYPE 2

GENERAL CHARACTERISTICS

Construction and test standards	IEC 60228 HD 21.15
Rated voltage U_0/U	450/750 V
Test voltage	2 500 V a.c. 5 minutes
Conductor maximum operating temperature	70°C
Maximum short-circuit temperature	160°C (t ≤ 5s)
Minimum bending radius (mm)	9 x d
Maximum pulling force over conductor (N)	15 x S
Flame retardant	IEC 60332-1-2 • EN 60332-1-2 (cable vertically mounted, length of charred cable ≤ 540 mm)
Fire retardant	IEC 60332-3-24 • EN 60332-3-24 (bunch of cables vertically mounted on a ladder, length of charred cable ≤ 2,5 m)
Halogen free	
Low smoke	IEC 61034-2 • EN 61034-2 (cable light transmittance ≥ 60%)
Low toxicity	IEC 60754-1 • EN 50267-2-1 (halogen acid gas content ≤ 0,5%)
Low corrosivity	IEC 60754-2 • EN 50267-2-2 (pH ≥ 4,3 • conductivity ≤ 10µS/mm)

S – conductor cross-section (mm²)

d – cable outer diameter (mm)



ELECTRICAL AND DIMENSIONAL CHARACTERISTICS

Cable composition n.º cond. x cross-section (mm²)	Approximate outer diameter (mm)	Approximate weight (kg/km)	Current carrying capacity One circuit inside embedded conduits T = 30°C	
			(A)	
			2 charged conductors	3 charged conductors
1 x 1,5	3,0	20	17,5	15,5
1 x 2,5	4,0	35	24	21
1 x 4	4,5	46	32	28
1 x 6	5,0	65	41	36
1 x 10	6,5	115	57	50
1 x 16	7,5	170	76	68
1 x 25	9,5	260	101	89
1 x 35	10,5	350	125	110
1 x 50	12,5	495	151	134
1 x 70	15,0	680	192	171
1 x 95	16,5	890	232	207
1 x 120	18,5	1 130	269	239

Other compositions are available, contact inform@cabelte.pt for information.

Only one circuit is considered.

LOW VOLTAGE CABLE

APPLICATION

Power supply cable for indoor installation, for rated voltages up to 300/500 V. Used in premises, kitchens, offices; for household appliances, including in damp premises, for medium duties like washing and drying machines, refrigerators and office machines.

CABLE DESIGNATION

Cu / PVC / PVC: H05VV-F • 05VV-F

CONSTRUCTION CHARACTERISTICS

Conductor

Copper (plain annealed): Flexible Class 5.

Insulation

PVC (Polyvinyl chloride), type TI 2.

Oversheath

PVC (Polyvinyl chloride), type TM 2.

COLOUR AND CABLE MARKING

Black (or other upon request).

Oversheath marked at regular intervals with the following information:

<CERTIF> <HAR> CABELTE H05VV-F

CABELTE 05VV-F

IDENTIFICATION OF INSULATED CONDUCTORS

N.º of conductors		2	3	4	5
Insulation colouring (HD 308.S2)	With earth conductor	-	GNYE-BU-BN	GNYE-BN-BK-GY	GNYE-BU-BN-BK-GY
	Without earth conductor	BU-BN	BN-BK-GY	BU-BN-BK-GY	BU-BN-BK-GY-BK

GENERAL CHARACTERISTICS

Construction and test standards	IEC 60228 HD 21.5
Rated voltage U_0/U	300/500 V
Test voltage	1 500 V a.c. 5 minutes ($S = 0,75$ and 1 mm^2) 2 000 V a.c. 5 minutes ($S \geq 1,5 \text{ mm}^2$)
Conductor maximum operating temperature	70°C
Maximum short-circuit temperature	160°C ($t \leq 5\text{s}$)
Minimum bending radius (mm)	$5 \times d$ if $d \leq 12$ • $6 \times d$ if $d > 12$
Maximum pulling force over conductor (N)	$15 \times S$ Recommended not to exceed 1000 N
Flame retardant	IEC 60332-1-2 • EN 60332-1-2 (cable vertically mounted, length of charred cable ≤ 540 mm)

S – conductor cross-section (mm^2)

d – cable outer diameter (mm)



ELECTRICAL AND DIMENSIONAL CHARACTERISTICS

Cable composition n.º cond. x cross-section (mm²)	Approximate outer diameter (mm)	Approximate weight (kg/km)	Current carrying capacity In open air T = 30°C (A)	
			2 charged conductors	3 charged conductors
H05VV-F				
2 x 0,75	7,0	55	6	
2 x 1,0	7,0	65	10	
2 x 1,5	8,0	85	22	
2 x 2,5	10,0	135	30	
2 x 4	11,0	185	40	
3 x 0,75	7,5	70	6	
3 x 1,0	7,5	80	10	
3 x 1,5	9,0	110	22	
3 x 2,5	10,5	170	30	
3 x 4	12,0	235	40	
4 x 0,75	8,0	80		12
4 x 1,0	8,5	100		13
4 x 1,5	10,0	140		18
4 x 2,5	11,5	205		25
4 x 4	13,0	290		34
5 x 0,75	9,0	105		6
5 x 1,0	9,5	130		10
5 x 1,5	11,0	165		18
5 x 2,5	13,0	250		25
5 x 4	14,5	375		34
05VV-F				
2 x 6	13,5	265	51	
3 x 6	14,0	335	51	
4 x 6	15,5	415		43
5 x 6	16,0	475		43
7 x 1,5	12,0	225	12	
7 x 2,5	14,5	340	16	

Other compositions are available, contact inform@cabelte.pt for information.

Only one circuit is considered.

Cables with 2 and 3 conductors: 2 charged conductors.

Cables with 4 and 5 conductors: 3 charged conductors.

LOW VOLTAGE CABLE

APPLICATION

Power supply cable for rated voltage up to 0,6/1kV. Suitable for indoor and outdoor fixed installations, protected or not, in industrial areas, buildings and similar applications.

CABLE DESIGNATION

Cu / XLPE / PVC: **XV • FXV**

Al / XLPE / PVC: **LXV**

F – Flexible

CONSTRUCTION CHARACTERISTICS

Conductor

Copper (plain annealed): solid class 1 or stranded class 2 or flexible class 5, circular or sector shaped

Aluminium: stranded class 2, circular or sector shaped.

Insulation

XLPE – (Cross-linked polyethylene).

Oversheath

PVC – (Polyvinyl chloride), type ST 2.

COLOUR AND CABLE MARKING

Black (or other upon agreement).

Oversheath marked at regular intervals with the following information:

CABELTE <Cable designation> <n.^o cond.> x <cross-section> 0,6/1kV <year of manufacture> <metric marking>

IDENTIFICATION OF INSULATED CONDUCTORS

N. ^o of conductors		2	3	4	5
Insulation colouring (HD 308.S2)	With earth conductor	-	GNYE-BU-BN	GNYE-BN-BK-GY	GNYE-BU-BN-BK-GY
	Without earth conductor	BU-BN	BN-BK-GY	BU-BN-BK-GY	BU-BN-BK-GY-BK

GENERAL CHARACTERISTICS

Construction and test standards	IEC 60228 • IEC 60502-1
Rated voltage U_0/U	0,6 / 1 kV
Test voltage	3,5 kV a.c. 5 minutes
Conductor maximum operating temperature	90°C
Maximum short-circuit temperature	250°C (t ≤ 5s)
Minimum bending radius (mm) (permanent, after installation) (during installation)	4xd if d < 25 • 6xd if d ≥ 25 • 8xd if sector shape cond. 6xd if d < 25 • 9xd if d ≥ 25 • 12xd if sector shape cond.
Maximum pulling force over conductor (N)	Copper – 50 x S Aluminium – 30 x S
Flame retardant	IEC 60332-1-2 • EN 60332-1-2 (cable vertically mounted, length of charred cable ≤ 540 mm)

S – conductor cross-section (mm²)

d – cable outer diameter (mm)



ADDITIONAL CHARACTERISTICS *

Fire retardant (frt)

IEC 60332-3-24 · EN 60332-3-24 (bunch of cables vertically mounted on a ladder, length of charred cable ≤ 2,5 m)

Oil resistant, Hydrocarbon resistance

*Can be supplied upon agreement.

ELECTRICAL AND DIMENSIONAL CHARACTERISTICS

Cable composition n.º cond. x cross-section (mm²)	Approximate outer diameter (mm)	Approximate weight (kg/km)	Current carrying capacity In open air ⁽²⁾ T = 30°C (A)	
			2 charged conductors	3 charged conductors
XV				
1 x 10	8,5	150	90	80
1 x 16	9,5	210	121	107
1 x 25	11	310	161	141
1 x 35	12,5	405	200	176
1 x 50	13,5	530	242	216
1 x 70	15,5	735	310	279
1 x 95	17,5	985	377	342
1 x 120	19,5	1 230	437	400
1 x 150	21	1 490	504	464
1 x 185	22,5	1 855	575	533
1 x 240	25,5	2 395	679	634
1 x 300	29	3 020	783	736
1 x 400	32,5	3 940	940	868
1 x 500	36	4 875	1 083	998
2 x 1,5	9	115	26	
2 x 2,5	9,5	145	36	
2 x 4	11	190	49	
2 x 6	12	245	63	
2 x 10	14,5	380	86	
2 x 16	16,5	535	115	
2 x 25	20,5	835	149	
2 x 35 ⁽¹⁾	17,5	800	185	
2 x 50 ⁽¹⁾	20	1 060	225	
3 x 1,5	9,5	130	26	
3 x 2,5	10	170	36	
3 x 4	11,5	230	49	
3 x 6	12,5	300	63	
3 x 10	15,5	470	86	

LOW VOLTAGE CABLE

Cable composition n.º cond. x cross-section (mm ²)	Approximate outer diameter (mm)	Approximate weight (kg/km)	Current carrying capacity In open air ⁽²⁾ T = 30°C (A)	
			2 charged conductors	3 charged conductors
3 x 16	18	700	115	
3 x 25	22	1 050	149	
3 x 35 ⁽¹⁾	20,5	1 145	185	
3 x 50 ⁽¹⁾	23,5	1 520	225	
4 x 1,5	10	155		23
4 x 2,5	11	205		32
4 x 4	12,5	275		42
4 x 6	13,5	370		54
4 x 10	16,5	560		75
4 x 16	19,5	865		100
3 x 16 + 1 x 10	19	815		100
3 x 25 + 1 x 16	23	1 220		127
3 x 35 + 1 x 16 ⁽¹⁾	24	1 360		158
3 x 50 + 1 x 25 ⁽¹⁾	27	1 825		192
3 x 70 + 1 x 35 ⁽¹⁾	31,5	2 575		246
3 x 95 + 1 x 50 ⁽¹⁾	35,5	3 520		298
3 x 120 + 1 x 70 ⁽¹⁾	39	4 410		346
3 x 150 + 1 x 70 ⁽¹⁾	42,5	5 375		399
3 x 185 + 1 x 95 ⁽¹⁾	45	6 835		456
3 x 240 + 1 x 120 ⁽¹⁾	53	8 655		538
5 x 1,5	11	185		23
5 x 2,5	12	245		32
5 x 4	13,5	335		42
5 x 6	14,5	450		54
5 x 10	18	690		75
5 x 16	21,5	1 065		100
3 x 16 + 2G10	20	885		100
3 x 25 + 2G16	24,5	1 380		127
3 x 35 + 2G16	26	1 705		158
3 x 50 + 2G25	30,5	2 340		192
3 x 70 + 2G35	35	3 260		246
3 x 95 + 2G50	41	4 490		298
3 x 120 + 2G70	46	5 805		346
3 x 150 + 2G70	49	6 735		399
3 x 185 + 2G95	53,5	8 505		456
3 x 240 + 2G120	61	10 985		538

Cable composition n.º cond. x cross-section (mm²)	Approximate outer diameter (mm)	Approximate weight (kg/km)	Current carrying capacity In open air ⁽²⁾ T = 30°C	
			(A)	
			2 charged conductors	3 charged conductors
LXV				
1 x 16	9,5	115	—	84
1 x 25	11	155	121	107
1 x 35	12	195	150	135
1 x 50	13,5	240	184	165
1 x 70	15,5	320	237	215
1 x 95	17	410	289	264
1 x 120	19	505	337	308
1 x 150	21	605	389	358
1 x 185	23	745	447	413
1 x 240	25,5	925	530	492
1 x 300	29	1 145	613	571
1 x 400	32,5	1 465	740	694
1 x 500	36	1 820	856	806
1 x 630	41,5	2 375	996	942
4 x 16	19,5	475		77
4 x 25	24	695		97
3 x 25 + 1 x 16	23	665		97
3 x 35 + 1 x 16 ⁽¹⁾	24	625		120
3 x 50 + 1 x 25 ⁽¹⁾	27	795		146
3 x 70 + 1 x 35 ⁽¹⁾	31,5	1 110		187
3 x 95 + 1 x 50 ⁽¹⁾	35,5	1 455		227
3 x 120 + 1 x 70 ⁽¹⁾	39	1 800		263
3 x 150 + 1 x 70 ⁽¹⁾	42,5	2 200		304
3 x 185 + 1 x 95 ⁽¹⁾	45	2 700		347
3 x 240 + 1 x 120 ⁽¹⁾	53	3 475		407

Other compositions are available, contact inform@cabelte.pt for information.

(1) Phase conductors sector shape.

(2) Installation in free air or on perforated cable tray, horizontal or vertical.

Only one circuit is considered.

Singlecore cables – Flat touching installation.

Cables with 2 and 3 conductors: 2 charged conductors.

Cables with 4 and 5 conductors: 3 charged conductors.

For compositions of 4 conductors, the same characteristics apply if the fourth conductor is the earth conductor or neutral conductor.

APPLICATION

Power supply in places requiring extra fire safety precautions. Fire retardant, high security cable, for rated voltages up to 0,6/1kV. Suitable for fixed installations, in public areas such as hospitals, hotels, shopping malls, computer and communication centres and, in general, in all places where it is required a high degree of protection of persons and assets or/and with a large number of people and electrical and electronic equipment.

CABLE DESIGNATION

Cu/XLPE/LSHF: XZ1 (frt,zh) • FXZ1 (frt,zh)

Al/XLPE/LSHF: LXZ1 (frt,zh)

F – Flexible

CONSTRUCTION CHARACTERISTICS

Conductor

Copper (plain annealed): solid class 1, or stranded class 2, or flexible class 5, circular or sector shape.

Aluminium: stranded class 2, circular or sector shape.

Insulation

XLPE – (Cross-linked polyethylene).

Oversheath

LSHF – Low Smoke Halogen Free thermoplastic compound, fire retardant, type ST8.

COLOUR AND CABLE MARKING

Green or Black upon request. Oversheath marked at regular intervals with the following information:

CABELTE <Cable designation> <n.^o cond.> x <cross-section> 0,6/1kV <year of manufacture> <metric marking>

IDENTIFICATION OF INSULATED CONDUCTORS

N. ^o of conductors		2	3	4	5
Insulation colouring (HD 308.S2)	With earth conductor	-	GNYE-BU-BN	GNYE-BN-BK-GY	GNYE-BU-BN-BK-GY
	Without earth conductor	BU-BN	BN-BK-GY	BU-BN-BK-GY	BU-BN-BK-GY-BK

Insulation colour for single core cables – Black.

GENERAL CHARACTERISTICS

Construction and test standards	IEC 60228 • IEC 60502-1
Rated voltage U_0/U	0,6 / 1 kV
Test voltage	3,5 kV a.c. 5 minutes
Conductor maximum operating temperature	90°C
Maximum short-circuit temperature	250°C (t ≤ 5s)
Minimum bending radius (mm) (permanent, after installation) (during installation)	4xd if d<25 • 6xd if d≥25 • 8xd if sector shape cond. 6xd if d<25 • 9xd if d≥25 • 12xd if sector shape cond.
Maximum pulling force over conductor (N)	Copper – 50 x S Aluminium – 30 x S

S – conductor cross-section (mm²) • d – cable outer diameter (mm)



Flame retardant	IEC 60332-1-2 · EN 60332-1-2 (cable vertically mounted, length of charred cable ≤ 540 mm)
Fire retardant (frt)	IEC 60332-3-24 · EN 60332-3-24 (bunch of cables vertically mounted on a ladder, length of charred cable ≤ 2,5 m)
Halogen free (zh)	
Low smoke	IEC 61034-2 · EN 61034-2 (cable light transmittance ≥ 60%)
Low toxicity	IEC 60754-1 · EN 50267-2-1 (halogen acid gas content ≤ 0,5%)
Low corrosivity	IEC 60754-2 · EN 50267-2-3 (pH ≥ 4,3 · conductivity ≤ 10µS/mm)

ELECTRICAL AND DIMENSIONAL CHARACTERISTICS

Cable composition n.º cond. x cross-section (mm²)	Approximate outer diameter (mm)	Approximate weight (kg/km)	Current carrying capacity In open air ⁽²⁾ T = 30° C (A)	
			2 charged conductors	3 charged conductors
XZ1				
1 x 10	8,5	135	90	80
1 x 16	9,5	195	121	107
1 x 25	11,0	295	161	141
1 x 35	12,0	385	200	176
1 x 50	13,5	510	242	216
1 x 70	15,5	715	310	279
1 x 95	17,5	970	377	342
1 x 120	19,5	1 215	437	400
1 x 150	21,0	1 480	504	464
1 x 185	22,5	1 840	575	533
1 x 240	25,5	2 375	679	634
1 x 300	29,5	2 980	783	736
2 x 1,5	9,0	110	26	868
2 x 2,5	9,5	135	36	998
2 x 4	11,0	180	49	
2 x 6	12,0	235	63	
2 x 10	14,5	350	86	
2 x 16	16,5	500	115	
3 x 1,5	9,5	125	26	
3 x 2,5	10,0	160	36	
3 x 4	11,5	220	49	
3 x 6	12,5	290	63	
3 x 10	15,5	440	86	
3 x 16	18,0	635	115	
4 x 1,5	10,0	145		23
4 x 2,5	11,0	195		32
4 x 4	12,5	265		42
4 x 6	13,5	355		54
4 x 10	16,5	550		75
3 x 16 + 1 x 10	18,5	745		100
3 x 25 + 1 x 16	23,0	1 140		127
3 x 35 + 1 x 16 ⁽¹⁾	24,0	1 330		158

LOW VOLTAGE CABLE

Cable composition n.º cond. x cross-section (mm ²)	Approximate outer diameter (mm)	Approximate weight (kg/km)	Current carrying capacity In open air ⁽²⁾ T = 30° C (A)	
			2 charged conductors	3 charged conductors
3 x 50 + 1 x 25 ⁽¹⁾	27,0	1 795		192
3 x 70 + 1 x 35 ⁽¹⁾	31,5	2 535		246
3 x 95 + 1 x 50 ⁽¹⁾	35,5	3 460		298
3 x 120 + 1 x 70 ⁽¹⁾	39,0	4 385		346
3 x 150 + 1 x 70 ⁽¹⁾	42,5	5 295		399
3 x 185 + 1 x 95 ⁽¹⁾	45,0	6 735		456
3 x 240 + 1 x 120 ⁽¹⁾	53,0	8 550		538
5 x 1,5	11,0	175		23
5 x 2,5	12,0	230		32
5 x 4	13,0	320		42
5 x 6	14,5	435		54
5 x 10	18,0	670		75
3 x 16 + 2G10	20,0	865		100
3 x 25 + 2G16	24,5	1 315		127
3 x 35 + 2G16	26,0	1 680		158
XZ1				
3 x 50 + 2G25	30,5	2 250		192
3 x 70 + 2G35	35,0	3 160		246
3 x 95 + 2G50	41,0	4 485		298
3 x 120 + 2G70	46,0	5 875		346
3 x 150 + 2G70	49,0	6 835		399
3 x 185 + 2G95	53,5	7 900		456
3 x 240 + 2G120	61,0	11 115		538
LXZ1				
1 x 25	11,0	125		107
1 x 50	12,0	195		165
1 x 95	17,0	355		264
1 x 150	21,0	525		358
1 x 240	25,5	830		492

Other compositions are available, contact inform@cabelte.pt for information.

(1) Phase conductors sector shape.

(2) Installation in free air or on perforated cable tray, horizontal or vertical.

Only one circuit is considered.

Singlecore cables – Flat touching installation.

Cables with 2 and 3 conductors: 2 charged conductors.

Cables with 4 and 5 conductors: 3 charged conductors.

For compositions of 4 conductors, the same characteristics apply if the fourth conductor is the earth conductor or neutral conductor.

LOW VOLTAGE CABLE

APPLICATION

Fire resistant, halogen-free, high security cable, for rated voltages up to 0,6/1kV. For power supply to priority security systems that should be maintained in function during a fire. Suitable for indoor use, fixed installations, in public areas such as hospitals, hotels, shopping malls, airports, underground railway networks, tunnels, communication centres, and, in general, in all places where it is required a high degree of protection of persons and assets or/and with a large number of people and electrical/electronic equipment.

CABLE DESIGNATION

Cu/MICA/XLPE/LSHF: XZ1(frs, zh) • FXZ1(frs,zh)

F – Flexible

CONSTRUCTION CHARACTERISTICS

Conductor

Copper (plain annealed): stranded class 2 or flexible class 5, circular.

Insulation

Mica tapes, XLPE – (Cross-linked polyethylene).

Oversheath

LSHF – Low Smoke Halogen Free thermoplastic compound, fire retardant, type ST8.

COLOUR AND CABLE MARKING

Orange or Black upon request. Oversheath marked at regular intervals with the following information: CABELTE <Cable designation> <n.^o cond.> x <cross-section> 0,6/1kV <year of manufacture> <metric marking>

IDENTIFICATION OF INSULATED CONDUCTORS

N. ^o of conductors		2	3	4	5
Insulation colouring (HD 308.S2)	With earth conductor	-	GNYE-BU-BN	GNYE-BN-BK-GY	GNYE-BU-BN-BK-GY
	Without earth conductor	BU-BN	BN-BK-GY	BU-BN-BK-GY	BU-BN-BK-GY-BK

Insulation colour for single core cables – Black.

GENERAL CHARACTERISTICS

Construction and test standards	IEC 60228 • IEC 60502-1
Rated voltage U_0/U	0,6 / 1 kV
Test voltage	3,5 kV a.c. 5 minutes
Conductor maximum operating temperature	90° C
Maximum short-circuit temperature	250°C (t ≤ 5s)
Minimum bending radius (mm) (permanent, after installation) (during installation)	4xd if d<25 • 6xd if d≥25 6xd if d<25 • 9xd if d≥25
Maximum pulling force over conductor (N)	50 x S

S – conductor cross-section (mm²)

d – cable outer diameter (mm)



GENERAL CHARACTERISTICS

Flame retardant	IEC 60332-1-2 • EN 60332-1-2 (cable vertically mounted, length of charred cable ≤ 540 mm)
Fire retardant (frt)	IEC 60332-3-24 • EN 60332-3-24 (bunch of cables vertically mounted on a ladder, length of charred cable ≤ 2,5 m)
Fire resistant (frs)	IEC 60331-21 (750°C, charge circuit, time ≥ 90 minutes)
Halogen free (zh)	
Low smoke	IEC 61034-2 • EN 61034-2 (cable light transmittance ≥ 60%)
Low toxicity	IEC 60754-1 • EN 50267-2-1 (halogen acid gas content ≤ 0,5%)
Low corrosivity	IEC 60754-2 • EN 50267-2-3 (pH ≥ 4,3 • conductivity ≤ 10μS/mm)

ELECTRICAL AND DIMENSIONAL CHARACTERISTICS

Cable composition n.º cond. x cross-section (mm²)	Approximate outer diameter (mm)	Approximate weight (kg/km)	Current carrying capacity In open air ⁽¹⁾ T = 30° C	
			(A)	
			2 charged conductors	3 charged conductors
XZ1				
1 x 10	9,5	150	90	80
1 x 16	10,5	210	121	107
1 x 25	12,0	310	161	141
1 x 35	13,0	405	200	176
1 x 50	14,5	530	242	216
1 x 70	16,5	805	310	279
1 x 95	18,0	995	377	342
1 x 120	20,0	1 235	437	400
1 x 150	21,5	1 500	504	464
1 x 185	24,0	1 865	575	533
1 x 240	26,5	2 400	679	634
1 x 300	29,5	3 010	783	736
2 x 1,5	11,0	140	26	
2 x 2,5	12,0	175	36	
2 x 4	13,0	225	49	
2 x 6	14,0	280	63	
2 x 10	15,5	385	86	
2 x 16	18,0	545	115	
2 x 25	21,0	810	149	
3 x 1,5	11,5	160	26	
3 x 2,5	12,0	175	36	
3 x 4	14,0	270	49	
3 x 6	14,5	335	63	
3 x 10	16,5	480	86	
4 x 1,5	12,5	190		23
4 x 2,5	13,5	240		32
4 x 4	15,0	325		42
4 x 6	16,0	410		54
4 x 10	18,0	595		75
4 x 16	21,0	850		100

LOW VOLTAGE CABLE

Cable composition n.º cond. x cross-section (mm ²)	Approximate outer diameter (mm)	Approximate weight (kg/km)	Current carrying capacity In open air ⁽¹⁾ T = 30° C (A)	
			2 charged conductors	3 charged conductors
3 x 16 + 1 x 10	20,0	800		100
3 x 25 + 1 x 16	23,5	1 205		127
3 x 35 + 1 x 16	25,5	1 525		158
3 x 50 + 1 x 25	29,0	2 050		192
3 x 70 + 1 x 35	35,5	2 870		246
3 x 95 + 1 x 50	37,5	3 875		298
3 x 120 + 1 x 70	42,5	4 965		346
5 x 1,5	13,5	225		23
5 x 2,5	14,5	295		32
5 x 4	16,5	390		42
5 x 6	17,5	500		54
5 x 10	19,5	730		75
5 x 16	23,0	1 055		100
3 x 25 + 2G16	25,5	1 390		127
3 x 35 + 2G16	31,0	2 320		158
3 x 50 + 2G25	27,0	3 160		192
3 x 70 + 2G35	35,5	4 485		246
3 x 95 + 2G50	40,5	5 875		298

Other compositions are available, contact inform@cabelte.pt for information.

(1) Installation in free air or on perforated cable tray, horizontal or vertical.

Only one circuit is considered.

Singlecore cables – Flat touching installation.

Cables with 2 and 3 conductors: 2 charged conductors.

Cables with 4 and 5 conductors: 3 charged conductors.

For compositions of 4 conductors, the same characteristics apply if the fourth conductor is the earth conductor or neutral conductor.

LOW VOLTAGE CABLE

APPLICATION

Fire resistant, halogen-free, high security cable, for rated voltages up to 0,6/1kV. For power supply to priority security systems that should be maintained in function during a fire. Suitable for indoor use, fixed installations, in public areas such as hospitals, hotels, shopping malls, airports, underground railway networks, tunnels, communication centres, and, in general, in all places where it is required a high degree of protection of persons and assets or/and with a large number of people and electrical/electronic equipment.

CABLE DESIGNATION

Cu/Silicone/LSHF: SZ1(frs,zh) • SZ1-K(frs,zh)

K-Flexible

CONSTRUCTION CHARACTERISTICS

Conductor

Copper (plain annealed): solid class 1 or stranded class 2 or class5 (flexible), circular.

Insulation

Silicone rubber.

Oversheath

LSHF – Low Smoke Halogen Free thermoplastic compound, fire retardant, type ST8.

COLOUR AND CABLE MARKING

Orange. Oversheath marked at regular intervals with the following information:

CABELTE <Cable designation> <n.^o cond.> x <cross-section> 0,6/1kV <year of manufacture> <metric marking>

IDENTIFICATION OF INSULATED CONDUCTORS

N. ^o of conductors		2	3	4	5
Insulation colouring (HD 308.S2)	With earth conductor	-	GNYE-BU-BN	GNYE-BN-BK-GY	GNYE-BU-BN-BK-GY
	Without earth conductor	BU-BN	BN-BK-GY	BU-BN-BK-GY	BU-BN-BK-GY-BK

Insulation colour for single core cables – Black.

GENERAL CHARACTERISTICS

Construction and test standards	IEC 60228 IEC 60502-1
Rated voltage U_0/U	0,6 / 1 kV
Test voltage	3,5 kV a.c. 5 minutes
Conductor maximum operating temperature	90°C
Maximum short-circuit temperature	250°C (t ≤ 5s)
Minimum bending radius (permanent, after installation)	6 x d
During laying higher value should be consider.	
Maximum pulling force over conductor (N)	50 x S

S – conductor cross-section (mm²) • d – cable outer diameter (mm)



GENERAL CHARACTERISTICS

Flame retardant	IEC 60332-1-2 • EN 60332-1-2 (cable vertically mounted, length of charred cable ≤ 540 mm)
Fire retardant (frt)	IEC 60332-3-24 • EN 60332-3-24 (bunch of cables vertically mounted on a ladder, length of charred cable ≤ 2,5 m)
Fire resistant (frs)	IEC 60331-21 (750°C, charge circuit, time ≥ 90 minutes)
Halogen free (zh)	
Low smoke	IEC 61034-2 • EN 61034-2 (cable light transmittance ≥ 60%)
Low toxicity	IEC 60754-1 • EN 50267-2-1 (halogen acid gas content ≤ 0,5%)
Low corrosivity	IEC 60754-2 • EN 50267-2-3 (pH ≥ 4,3 • conductivity ≤ 10µS/mm)

ELECTRICAL AND DIMENSIONAL CHARACTERISTICS

Cable composition n.º cond. x cross-section (mm²)	Approximate outer diameter (mm)	Approximate weight (kg/km)	Current carrying capacity In open air ⁽¹⁾ T = 30° C	
			(A)	
			2 charged conductors	3 charged conductors
SZ1-K				
1 x 1,5	6,0	55	26	23
1 x 2,5	6,5	70	36	32
1 x 4	7,5	90	49	42
1 x 6	8,0	115	63	54
2 x 1,5	9,0	120	26	
2 x 2,5	10,0	150	36	
2 x 4	11,0	195	49	
2 x 6	12,5	260	63	
3 x 1,5	9,5	140	26	
3 x 2,5	10,5	185	36	
3 x 4	11,5	240	49	
3 x 6	13,0	330	63	
4 x 1,5	11,0	165		23
4 x 2,5	12,0	225		32
4 x 4	12,5	295		42
4 x 6	14,0	410		54
5 x 1,5	11,0	200		23
5 x 2,5	12,0	265		32
5 x 4	13,5	355		42
5 x 6	14,5	495		54

Other compositions are available, contact inform@cabelte.pt for information.

(1) Installation in free air or on perforated cable tray, horizontal or vertical.

Only one circuit is considered.

Singlecore cables – Flat touching installation.

Cables with 2 and 3 conductors: 2 charged conductors.

Cables with 4 and 5 conductors: 3 charged conductors.

For compositions of 4 conductors, the same characteristics apply if fourth conductor is the earth conductor or neutral conductor.

LOW VOLTAGE CABLE

APPLICATION

Control cable for rated voltage up to 0,6/1kV. Suitable for indoor or outdoor fixed installations, protected or not. Particularly indicated where flexibility is required, for example, in installations with complex geometry paths.

CABLE DESIGNATION

Cu / PVC / PVC: VV-K

CONSTRUCTION CHARACTERISTICS

Conductor

Copper (plain annealed): Circular, flexible, class 5.

Insulation

PVC – (Polyvinyl chloride), type A.

Oversheath

PVC – (Polyvinyl chloride), type ST 1.

COLOUR AND CABLE MARKING

Black.

Oversheath marked at regular intervals with the following information:

CABELTE VV-K <n.^o cond.> x <cross-section> 0,6/1kV <year of manufacture> <metric marking>

IDENTIFICACIÓN DE LOS CONDUCTORES AISLADOS

N. ^o of conductors		6 to 37
Insulation colouring (HD 308.S2)	With earth conductor	Black and numbered + GN/YE
	Without earth conductor	Black and numbered

GENERAL CHARACTERISTICS

Construction and test standards	IEC 60228
	IEC 60502-1
	UNE 21123-1
Rated voltage U_0/U	0,6/1kV
Test voltage	3,5 kV a.c. 5 minutes
Conductor maximum operating temperature	70°C
Maximum short-circuit temperature	160°C (t ≤ 5s)
Minimum bending radius (mm)	5 x d
Maximum pulling force (N)	Pulling grip via oversheath: $3 \times d^2$
Flame retardant	IEC 60332-1-2 • EN 60332-1-2 (cable vertically mounted, length of charred cable ≤ 540 mm)

d – cable outer diameter (mm)



ELECTRICAL AND DIMENSIONAL CHARACTERISTICS

Cable composition n.º cond. x cross-section (mm ²)	Approximate outer diameter (mm)	Approximate weight (kg/km)	Current carrying capacity In open air ⁽¹⁾ T = 30° C (A)
5 x 1,5	12,5	220	13
6 x 1,5	13,5	250	12
7 x 1,5	13,5	260	12
8 x 1,5	15,0	335	12
10 x 1,5	16,5	350	10
12 x 1,5	17,0	405	10
14 x 1,5	18,0	455	9
16 x 1,5	19,0	515	9
19 x 1,5	20,0	575	8
24 x 1,5	23,0	715	7
30 x 1,5	24,5	865	6
37 x 1,5	26,5	1 040	6
5 x 2,5	14,0	285	18
6 x 2,5	15,0	335	16
7 x 2,5	15,5	350	16
8 x 2,5	17,5	455	16
10 x 2,5	18,5	460	13
12 x 2,5	19,5	550	13
14 x 2,5	20,5	635	12
16 x 2,5	21,5	720	12
19 x 2,5	23,0	805	11
24 x 2,5	26,0	990	10
30 x 2,5	27,5	1 215	8
37 x 2,5	29,5	1 415	8

(1) Only one cable installed.

LOW VOLTAGE CABLE

APPLICATION

Control cable for rated voltage up to 0,6/ 1kV. Suitable for indoor or outdoor fixed installations, protected or not.

CABLE DESIGNATION

CU / XLPE / PVC: XV

CONSTRUCTION CHARACTERISTICS

Conductor

Copper (plain annealed): Circular, stranded, class 2.

Insulation

XLPE – (Cross-linked polyethylene).

Oversheath

PVC – (Polyvinyl chloride), type ST 2.

COLOUR AND CABLE MARKING

Black. Oversheath marked at regular intervals with the following information:

CABELTE XV <n.º cond.> x <cross-section> 0,6/1kV <year of manufacture> <metric marking>

IDENTIFICACIÓN DE LOS CONDUCTORES AISLADOS

N.º of conductors	6 to 37	
Insulation colouring (HD 308.S2)	With earth conductor	Black and numbered + GN/YE
	Without earth conductor	Black and numbered

GENERAL CHARACTERISTICS

Construction and test standards	IEC 60228
	IEC 60502-1
Rated voltage U_0/U	0,6/1kV
Test voltage	3,5 kV a.c. 5 minutes
Conductor maximum operating temperature	90°C
Maximum short-circuit temperature	250°C ($t \leq 5s$)
Minimum bending radius (mm)	5 x d
Maximum pulling force (N)	Pulling grip via oversheath: $3 \times d^2$
Flame retardant	IEC 60332-1-2 • EN 60332-1-2 (cable vertically mounted, length of charred cable ≤ 540 mm)

d – cable outer diameter (mm)



ELECTRICAL AND DIMENSIONAL CHARACTERISTICS

Cable composition n.º cond. x cross-section (mm ²)	Approximate outer diameter (mm)	Approximate weight (kg/km)	Current carrying capacity In open air ⁽¹⁾ T = 30° C (A)
5 x 1,5	11,0	180	18
6 x 1,5	11,5	215	16
7 x 1,5	11,5	220	16
8 x 1,5	13,2	265	16
10 x 1,5	14,3	280	13
12 x 1,5	14,7	320	13
14 x 1,5	15,5	360	12
16 x 1,5	16,2	405	12
19 x 1,5	17,1	460	11
24 x 1,5	19,8	570	9
30 x 1,5	21,0	685	8
37 x 1,5	22,6	820	8
5 x 2,5	12,0	245	24
6 x 2,5	12,6	285	21
7 x 2,5	12,6	295	21
8 x 2,5	14,5	355	21
10 x 2,5	15,8	385	17
12 x 2,5	16,3	440	17
14 x 2,5	17,1	500	16
16 x 2,5	18,0	565	16
19 x 2,5	18,9	650	14
24 x 2,5	22,0	805	13
30 x 2,5	23,3	975	11
37 x 2,5	25,2	1 180	11

(1) Only one cable installed.

LOW VOLTAGE CABLE

APPLICATION

Power supply for rated voltages up to 0,6/1kV in applications where electromagnetic protection is required. For fixed installations, protected or not, in industrial areas, power plants, substations and buildings.

CABLE DESIGNATION

CU / XLPE / CU / PVC: XHV · FXHV

CU / XLPE / CU / LSHF: XHZ1 · FXHZ1

F – Flexible

CONSTRUCTION CHARACTERISTICS

Conductor

Copper (plain annealed): stranded class 2 or flexible class 5, circular.

Insulation

XLPE – (Cross-linked polyethylene).

Bedding /Inner Sheath

PVC – (Polyvinyl chloride) or LSHF – Low Smoke Halogen Free thermoplastic compound.

Screen (shield)

Corrugated copper tape with nominal thickness of 0,1 mm.

Optionally the copper tape can be helically applied with an overlap.

Oversheath

Extruded PVC (Polyvinyl chloride), type ST2 or LSHF – Low Smoke Halogen Free thermoplastic compound, fire retardant, type ST8.

Fire retardant PVC, Oil resistance PVC can be supplied upon agreement.

COLOUR AND CABLE MARKING

Black or Blue (or other upon agreement).

Oversheath marked at regular intervals with the following information:

CABELTE <Cable designation> <n.^o cond.> x <cross-section> 0,6/1kV <year of manufacture> <metric marking>

IDENTIFICATION OF INSULATED CONDUCTORS

N.º of conductors		2	3	4	5
Insulation colouring (HD 308.S2)	With earth conductor	-	GNYE-BU-BN	GNYE-BN-BK-GY	GNYE-BU-BN-BK-GY
	Without earth conductor	BU-BN	BN-BK-GY	BU-BN-BK-GY	BU-BN-BK-GY-BK

For cables with more than 5 conductors or in alternative to the above colour code, black numbered insulation will be used.

GENERAL CHARACTERISTICS

Construction and test standards	IEC 60228 IEC 60502-1
Rated voltage U_0/U	0,6 / 1 kV
Test voltage	3,5 kV a.c. 5 minutes



GENERAL CHARACTERISTICS

Conductor maximum operating temperature	90°C
Maximum short-circuit temperature	250°C (t ≤ 5s)
Minimum bending radius (mm)	10 x d
Maximum pulling force over conductor (N)	Copper – 50 x S
Flame retardant	IEC 60332-1-2 • EN 60332-1-2 (cable vertically mounted, length of charred cable ≤ 540 mm)

CHARACTERISTICS for XHZ1 and FXHZ1

Fire retardant (frt)	IEC 60332-3-24 • EN 60332-3-24 (bunch of cables vertically mounted on a ladder, length of charred cable ≤ 2,5 m)
Halogen free (zh)	
Low smoke	IEC 61034-2 • EN 61034-2 (cable light transmittance ≥ 60%)
Low toxicity	IEC 60754-1 • EN 50267-2-1 (halogen acid gas content ≤ 0,5%)
Low corrosivity	IEC 60754-2 • EN 50267-2-3 (pH ≥ 4,3 • conductivity ≤ 10µS/mm)

ADDITIONAL CHARACTERISTICS for XHV and FXHV

Fire retardant (frt)	IEC 60332-3-24 • EN 60332-3-24 (bunch of cables vertically mounted on a ladder, length of charred cable ≤ 2,5 m)
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S – conductor cross-section (mm²)
d – cable outer diameter (mm)

ELECTRICAL AND DIMENSIONAL CHARACTERISTICS

Cable composition n.º cond. x cross-section (mm²)	Approximate outer diameter (mm)	FXHV Approximate weight (kg/km)	FXHZ1 Approximate weight (kg/km)
2x0,5	12,4	190	180
2x1,0	13,4	220	210
2x1,5	13,4	240	230
2x2,5	14,4	280	270
2x4	15,4	330	320
2x6	16,4	400	390
2x10	18,5	530	510
2x16	22,0	750	720
2x25	23,6	960	930
4x0,5	13,4	220	210
4x1,0	14,4	260	250
4x1,5	14,4	280	270
4x2,5	16,4	350	330
4x4	17,4	430	410
4x6	18,5	540	530
4x10	20,5	720	700
4x16	25,0	1 050	1 030
4x25	28,1	1 410	1 380

LOW VOLTAGE CABLE

Cable composition n.º cond. x cross-section (mm ²)	Approximate outer diameter (mm)	FXHV Approximate weight (kg/km)	FXHZ1 Approximate weight (kg/km)
7x0,5	14,4	260	250
7x1,0	15,4	320	310
7x1,5	16,4	360	350
7x2,5	17,4	450	430
7x4	19,5	580	560
7x6	22,0	780	760
12x0,5	17,4	350	340
12x1,0	18,5	440	420
12x1,5	19,5	500	490
12x2,5	22,0	650	640
19x0,5	19,5	440	430
19x1,0	22,0	580	560
19x1,5	22,0	660	640
19x2,5	25,0	890	870
27x0,5	22,0	550	530
27x1,0	25,0	740	720
27x1,5	26,6	870	850
27x2,5	29,7	1 180	1 150
37x0,5	23,6	660	640
37x1,0	26,6	910	880
37x1,5	28,1	1 080	1 050

LOW VOLTAGE CABLE

APPLICATION

Power cables for energy supply used in industry, distribution boards and power stations, for rated voltage up to 0,6/1kV. The concentric conductor can be used as neutral* – protective or earthed conductor. Suitable for fixed installations indoor or outdoor.

* Depending of national regulations.

CABLE DESIGNATION

Cu / XLPE / Cu wire conductor / PVC: XOY • FXOY

F – Flexible

CONSTRUCTION CHARACTERISTICS

Conductor

Copper (plain annealed): stranded class 2, sector shape or circular, or circular flexible class 5.

Insulation

XLPE – (Cross-linked polyethylene).

Bedding/Inner sheath

PVC – (Polyvinyl chloride).

Neutral/Earth concentric conductor (CNE)

Single layer of plain annealed copper wires helically applied.

Oversheath

PVC – (Polyvinyl chloride).

COLOUR AND CABLE MARKING

Black. Oversheath marked at regular intervals with the following information:

CABELTE <Cable designation> <n.^o cond.> x <cross-section> 0,6/1kV <year of manufacture> <metric marking>

IDENTIFICATION OF INSULATED CONDUCTORS

N.º of conductors		2	3	4	5
Insulation colouring (HD 308.S2)	With earth conductor	-	GNYE-BU-BN	GNYE-BN-BK-GY	GNYE-BU-BN-BK-GY
	Without earth conductor	BU-BN	BN-BK-GY	BU-BN-BK-GY	BU-BN-BK-GY-BK

GENERAL CHARACTERISTICS

Construction and test standards	IEC 60228 IEC 60502-1
Rated voltage U_0/U	0,6 / 1 kV
Test voltage	3,5 kV a.c. 5 minutes
Conductor maximum operating temperature	90°C
Maximum short-circuit temperature	250°C (t ≤ 5s)



GENERAL CHARACTERISTICS

Minimum bending radius (mm)
(permanent, after installation)
(during installation)

4xd if $d < 25$ • 6xd if $d \geq 25$ • 8xd if sector shape cond.
6xd if $d < 25$ • 9xd if $d \geq 25$ • 12xd if sector shape cond.

Maximum pulling force over conductor (N)

50 x S
recommended not to exceed 20 000 N

Flame retardant

IEC 60332-1-2 • EN 60332-1-2 (cable vertically mounted,
length of charred cable ≤ 540 mm)

d – cable outer diameter (mm)

S – conductor cross-section (mm²)

ELECTRICAL AND DIMENSIONAL CHARACTERISTICS

Cable composition n.º cond. x cross-section (mm ²)	Approximate outer diameter (mm)	Approximate weight (kg/km)	Current carrying capacity, ⁽¹⁾ in open air T = 30°C (A)
3 x 6 / 6	17,0	460	54
3 x 10 / 10	18,5	645	75
3 x 16 / 16	20,5	910	100
3 x 25 / 16	24,5	1 275	127
3 x 35 / 16	24,5	1 405	158
3 x 50 / 25	27,5	1 870	192
3 x 70 / 35	31,5	2 625	246
3 x 95 / 50	35,5	3 560	298
3 x 120 / 70	39,0	4 520	346
3 x 150 / 70	43,0	5 395	395
3 x 185 / 95	47,0	6 815	450
4 x 6 / 6	17,5	525	54
4 x 10 / 10	19,5	755	75
4 x 16 / 16	22,5	1 100	100
4 x 25 / 16	26,0	1 530	127
4 x 35 / 16	27,5	1 780	158
4 x 50 / 25	31,5	2 455	192
4 x 70 / 35	36,0	3 370	246
4 x 95 / 50	39,5	4 570	298
4 x 120 / 70	44,5	5 760	346
4 x 150 / 70	46,5	6 625	395

Other compositions are available, contact inform@cabelte.pt for information.

(1) Current ratings for 3 phase systems.

Sector shape conductors for phase conductors with cross-section higher than 25 mm².

APPLICATION

Power transmission and distribution cable for rated voltage up to 0,6/1kV, with 3 or 4 insulated conductors. Suitable for indoor and outdoor fixed installations, protected or not, in industrial areas, buildings and similar applications.

CABLE DESIGNATION

Al / PVC / Cu concentric conductor / PVC: AKKJ

CONSTRUCTION CHARACTERISTICS

Conductor

Aluminium (plain annealed), stranded class 2, sector shaped.

Insulation

PVC.

Concentric conductor

Single layer of plain annealed copper wires and a copper binder tape, helically applied.

Oversheath

PVC – (Polyvinyl chloride) fire retardant.

COLOUR AND CABLE MARKING

Black.

Oversheath marked at regular intervals with the following information:

CABELTE <Cable designation> <n^o cond.> x <cross-section> 1kV <year of manufacture> <metric marking>

IDENTIFICATION OF INSULATED CONDUCTORS

N.º of conductors	3	4
Insulation colouring (HD 308.S2)	BN-BK-GY	BU-BN-BK-GY

GENERAL CHARACTERISTICS

Construction and test standards	IEC 60228 • EN 60228 HD 603 S1
Rated voltage U ₀ /U	0,6 / 1 kV
Test voltage	3,5 kV a.c. 5 minutes
Conductor maximum operating temperature	70°C
Maximum short-circuit temperature	160 °C (t ≤ 5s)
Maximum pulling force over conductor (N)	30 x S
Flame retardant	IEC 60332-1-2 • EN 60332-1-2 (cable vertically mounted, length of charred cable ≤ 540 mm)
Flame retardant	IEC 60332-3-23 • EN 60332-3-23 - Category B (bunch of cables vertically, length of charred cable ≤ 2,5 m).

S – conductor cross-section (mm²)



ELECTRICAL AND DIMENSIONAL CHARACTERISTICS

Cable composition n.º cond. x cross-section (mm²)	Approximate outer diameter (mm)	Approximate weight (kg/km)	Current carrying capacity, (1) in open air T = 30°C (A)
AKKJ			
3X50/15	27,0	970	124
3X70/21	30,0	1 280	158
3X95/29	35,0	1 710	190
3X120/41	37,5	2 160	220
3X150/41	41,0	2 500	252
3X185/57	45,0	3 250	289
3X240/72	50,5	4 010	339
3X300/88	56,0	5 100	377
4X50/15	30,0	1 220	124
4X70/21	34,5	1 640	158
4X95/29	39,5	2 180	190
4X120/41	42,5	2 670	220
4X150/41	46,5	3 140	252
4X185/57	51,0	3 920	289
4X240/72	57,5	5 060	339
4X300/88	63,5	6 370	377

(1) Normal operation, single cable laid in air, maximum conductor temperature = 70°C, protected from solar radiation.

LOW VOLTAGE CABLE

APPLICATION

Single and three core power distribution cables, for rated voltage up to 0,6/1kV.
Suitable for fixed installations protected or not.

CABLE DESIGNATION

Cu / XLPE / CNE / PVC • Al / XLPE / CNE / PVC
Cu / XLPE / SNE / PVC • Al / XLPE / SNE / PVC
Cu / XLPE / CNE / LSHF • Al / XLPE / CNE / LSHF
Cu / XLPE / SNE / LSHF • Al / XLPE / SNE / LSHF

CONSTRUCTION CHARACTERISTICS

Conductor

Copper (plain annealed): Circular, stranded, class 2;
Aluminium: Circular, solid class 1.

Insulation

XLPE – (Cross-linked polyethylene), type GP8.

Assembly and bedding for 3 phase cables

Synthetic tape bedding over conductors and fillers.

Neutral/Earth concentric conductor

CNE – Single layer of plain annealed copper wires helically applied;

SNE – Single layer of annealed copper wires:

Neutral conductor • wires are covered by an extruded polymeric compound – colour blue.

Earth continuity conductor • Bare wires.

String separators • Non-hygroscopic, located on either side of the group of the bare copper wires.

Oversheath

PVC – (Polyvinyl chloride), type 9;

or LSHF – Low Smoke Halogen Free thermoplastic compound, fire retardant, type LTS 1.

COLOUR AND CABLE MARKING

Black. Oversheath marked at regular intervals with the following information:

ELECTRIC CABLE 600/1000V < cable standard > CABELTE < n.^o cond. > x < cross-section > Al* < year of manufacture > < order of manufacture > < metric marking >

* If Cu – not identified.

IDENTIFICATION OF INSULATED CONDUCTORS

N. ^o of conductors	1	3
Insulation colouring	Brown	Brown-Black-Grey

GENERAL CHARACTERISTICS

Construction and test standards

BS EN 60228
BS 7870-3.11 (CNE / PVC cables)
BS 7870-3.21 (SNE / PVC cables)
BS 7870-3.12 (CNE / LSHF cables)
BS 7870-3.22 (SNE / LSHF cables)



GENERAL CHARACTERISTICS

Rated voltage U_0/U	0,6 / 1 kV
Test voltage	3,5 kV a.c. 5 minutes 500V d.c. 1 minute (between earth/neutral), for SNE
Conductor maximum operating temperature	90°C
Maximum short-circuit temperature	250 °C (t ≤ 5s)
Minimum bending radius	8 x d
Maximum pulling force over conductor (N)	Copper – 50 x S Aluminium – 30 x S
Flame retardant	BS EN 60332-1-2 (cable vertically mounted, length of charred cable ≤ 540 mm)

ADDITIONAL CHARACTERISTICS FOR LSHF CABLES

Fire retardant	BS EN 60332-3-24 (bunch of cables vertically mounted on a ladder, length of charred cable ≤ 2,5 m)
Halogen free	
Low smoke	BS EN 61034-2 (cable light transmittance ≥ 60%)
Low toxicity	BS EN 50267-2-1 (halogen acid gas content ≤ 0,5%)
Low corrosivity	BS EN 50267-2-3 (pH ≥ 4,3 • conductivity ≤ 10µS/mm)

ELECTRICAL AND DIMENSIONAL CHARACTERISTICS

CNE cables

Cable composition n.º cond. x cross-section (mm²)	Conductor material	Approximate outer diameter (mm)	Approximate weight (kg/km)	Maximum d.c. resistance @ 20°C (Ω/km)	
				Phase conductor	CNE
*1x4	Cu	8,5	140	4,61	4,8
1x16		12,0	370	1,15	1,2
1x25		14,0	550	0,727	0,76
3x16		21,0	840	1,15	1,2
3x25		24,5	1 190	0,727	0,76
1x25	Al	13,0	300	1,2	1,3
1x35		14,0	390	0,868	0,91
3x25		23,0	650	1,2	1,3
3x35		25,0	820	0,868	0,91

* – only for PVC cables.

LOW VOLTAGE CABLE

SNE Cables

Cable composition n.º cond. x cross-section (mm ²)	Conductor material	Approximate outer diameter (mm)	Approximate weight (kg/km)	Maximum d.c. resistance @ 20°C (Ω/km)		
				Phase conductor	Neutral conductor	Earth conductor
*1x4	Cu	10,0	190	4,61	4,8	4,8
1x16		14,0	530	1,15	1,2	1,2
1x25		16,0	710	0,727	0,76	1,2
3x25		25,0	1 360	0,727	0,76	1,2
3x35		28,5	1 900	0,524	0,55	0,76
1x25	Al	15,0	490	1,20	1,2	1,2
1x35		16,0	610	0,868	0,76	1,2
3x25		23,5	830	1,2	1,2	1,2
3x35		26,0	1 030	0,868	0,76	1,20

* - only for PVC cables.

APPLICATION

Single and three core cables, with concentric conductor, rated voltage 0,6/1kV. Used for power distribution networks. Can be supplied with the telemetry cable used for telemetry measurements – smart grids.

CABLE DESIGNATION

Branchement cable.

Branchement cable + Cable Téléréport.

CONSTRUCTION CHARACTERISTICS

Conductor

Solid aluminum conductors.

Insulation

XLPE – (Cross-linked polyethylene).

Assembly and bedding for 3 phase cables

PVC – (Polyvinyl chloride).

Neutral/Earth concentric conductor (CNE)

Single layer of plain annealed copper wires helically applied and continuity tape, applied in counter-helix.

Oversheath

PVC – (Polyvinyl chloride).

Telemetry cable

Cable Téléréport: armoured telephone cable with 1 quad, used to transmit the readings of energy consumption and deliver energy to a remote unit. Cable Téléréport is stranded with the Branchement cable.

COLOUR AND CABLE MARKING

Black. Oversheath marked at regular intervals with the following information:

Marking of Branchement cable

ELECTRIC CABLE 0,6/1kV CABELTE <n.^o cond.> x <cross-section> AL / 22CU <n.^o manufacturing batch> <year of manufacture> <metric marking>

Marking of Telemetry cable

TÉLÉREPORT ARMÉ CABELTE <n.^o cond.> x <cross-section> AL / 22CU <n.^o manufacturing batch> NF C 33-400

IDENTIFICATION OF INSULATED CONDUCTORS

N. ^o of conductors	1	3
Insulation colouring (HD 308.S2)	BN or BK or GY	BN-BK-GY

GENERAL CHARACTERISTICS

Construction and test standards	EDF HM-27/03/139B
Rated voltage U_0/U	0,6 / 1 kV
Test voltage	3,5 kV a.c. 5 minutes
Conductor maximum operating temperature	90°C



GENERAL CHARACTERISTICS

Maximum short-circuit temperature	250°C (t ≤ 5s)
Minimum bending radius	15 x d if cond = 1 • 12 x d if cond > 1
Maximum pulling force over conductor (N)	30 x S
Flame retardant	IEC 60332-1-2 • EN 60332-1-2 (cable vertically mounted, length of charred cable ≤ 540 mm)

S – conductor cross-section (mm²)
d – cable outer diameter (mm)

DIMENSIONAL CHARACTERISTICS

Câble branchement

Cable composition n.º cond. x cross-section (mm ²)	Approximate outer diameter (mm)	Approximate weight (kg/km)
1 x 35 Al / 22 Cu	14	400
1 x 35 Al / 22 Cu+ Téléreport	24	530
3 x 35 Al / 22 Cu	25	1 000
3 x 35 Al / 22 Cu + Téléreport	35	1 150

LOW VOLTAGE CABLE

APPLICATION

Cable for power supply, for rated voltage up to 0,6/1kV. Suitable for outdoor fixed installations when it is necessary to protect the cable against mechanical aggression or against rodents threat. Can be laid in free air, installed in ducts or directly buried.

Excellent mechanical protection during laying, installation and service.

CABLE DESIGNATION

Cu / XLPE / STA / PVC: XAV · FXAV

Al / XLPE / STA / PVC: LXAV

F – Flexible · STA – Steel tape armour

CONSTRUCTION CHARACTERISTICS

Conductor

Copper (plain annealed): solid class 1 or rigid stranded class 2 or class 5 (flexible), circular or sector shaped. Aluminium: stranded class 2, circular or sector shaped.

Insulation

XLPE – (Cross-linked polyethylene).

Bedding /Inner Sheath

PVC – (Polyvinyl chloride)

Armour

Two steel tapes (A) helical applied – galvanized tapes upon request.
For single core cables steel is substituted by aluminium tapes (1A).

Oversheath

PVC (Polyvinyl chloride), type ST 2.

COLOUR AND CABLE MARKING

Black (or other upon request). Oversheath marked at regular intervals with the following information:
CABELTE <Cable designation> <n.^o cond.> x <cross-section> 0,6/1kV <year of manufacture> <metric marking>

IDENTIFICATION OF INSULATED CONDUCTORS

N.° of conductors		2	3	4	5
Insulation colouring (HD 308.S2)	With earth conductor	-	GNYE-BU-BN	GNYE-BN-BK-GY	GNYE-BU-BN-BK-GY
	Without earth conductor	BU-BN	BN-BK-GY	BU-BN-BK-GY	BU-BN-BK-GY-BK

GENERAL CHARACTERISTICS

Construction and test standards	IEC 60228 IEC 60502-1
Rated voltage U_0/U	0,6 / 1 kV
Test voltage	3,5 kV a.c. 5 minutes
Conductor maximum operating temperature	90°C



GENERAL CHARACTERISTICS

Maximum short-circuit temperature	250°C (t ≤ 5s)
Minimum bending radius (mm)	15 x d
Maximum pulling force over conductor (N)	Copper – 50 x S Aluminium – 30 x S
Flame retardant	IEC 60332-1-2 · EN 60332-1-2 (cable vertically mounted, length of charred cable ≤ 540 mm)
S – conductor cross-section (mm ²) · d – cable outer diameter (mm).	

ADDITIONAL CHARACTERISTICS *

Fire retardant (frt)	IEC 60332-3-24 · EN 60332-3-24 (bunch of cables vertically mounted on a ladder, length of charred cable ≤ 2,5 m)
Oil resistant, Hidrocarbon resistance	

*Can be supplied upon agreement.

ELECTRICAL AND DIMENSIONAL CHARACTERISTICS

Cable composition n.º cond. x cross-section (mm²)	Approximate outer diameter (mm)	Approximate weight (kg/km)	Current carrying capacity Installation directly buried ⁽¹⁾ Ts = 20°C (A)	
			2 charged conductors	3 charged conductors
X1AV				
1 x 10	13,0	265		87
1 x 16	13,5	335		113
1 x 25	15,5	450		144
1 x 35	16,5	555		174
1 x 50	18,0	695		206
1 x 70	20,0	915		254
1 x 95	21,5	1 180		301
1 x 120	23,5	1 440		343
1 x 150	25,0	1 710		387
1 x 185	26,5	2 080		434
1 x 240	29,5	2 660		501
1 x 300	33,0	3 350		565
1 x 400	36,0	4 210		655
1 x 500	40,0	5 170		740
XAV				
2 x 1,5	11,5	220	37	
2 x 2,5	12,5	260	48	
2 x 4	13,5	315	63	
2 x 6	14,5	380	80	
2 x 10	16,5	525	104	
2 x 16	18,5	690	136	
2 x 25	22,0	990	173	
2 x 35 ⁽¹⁾	20,0	980	208	
2 x 50 ⁽¹⁾	22,0	1 270	247	

LOW VOLTAGE CABLE

Cable composition n.º cond. x cross-section (mm ²)	Approximate outer diameter (mm)	Approximate weight (kg/km)	Current carrying capacity Installation directly buried ⁽¹⁾ Ts = 20°C (A)	
			2 charged conductors	3 charged conductors
2 x 70 ⁽¹⁾	25,0	1 720	304	
3 x 1,5	12,0	240	37	
3 x 2,5	13,0	290	48	
3 x 4	14,0	360	63	
3 x 6	15,0	440	80	
3 x 10	17,5	620	104	
3 x 16	19,5	835	136	
4 x 1,5	13,0	275		31
4 x 2,5	13,5	330		41
4 x 4	15,0	415		53
4 x 6	16,0	520		66
4 x 10	18,5	740		87
4 x 16	21,0	1 020		113
3 x 16 + 1 G 10	20,5	960		113
3 x 25 + 1 x 16	24,0	1 390		144
3 x 35 + 1 x 16 ⁽¹⁾	26,0	1 600		174
3 x 50 + 1 x 25 ⁽¹⁾	29,0	2 110		206
3 x 70 + 1 x 35 ⁽¹⁾	33,5	2 890		254
3 x 95 + 1 x 50 ⁽¹⁾	39,0	4 190		301
3 x 120 + 1 x 70 ⁽¹⁾	42,5	5 150		343
3 x 150 + 1 x 70 ⁽¹⁾	46,5	6 200		387
3 x 185 + 1 x 95 ⁽¹⁾	48,5	7 640		434
3 x 240 + 1 x 120 ⁽¹⁾	57,0	9 670		501
LX1AV				
1 x 16	13,5	240		87
1 x 25	15,5	305		111
1 x 35	16,5	350		134
1 x 50	17,5	410		160
1 x 70	19,5	510		197
1 x 95	21,5	615		234
1 x 120	23,0	730		266
1 x 150	25,0	850		300
1 x 185	27,0	1 010		337
1 x 240	29,5	1 220		388
1 x 300	33,0	1 480		400
1 x 400	36,0	1 810		506
1 x 500	39,5	2 200		575

Cable composition n.º cond. x cross-section (mm²)	Approximate outer diameter (mm)	Approximate weight (kg/km)	Current carrying capacity Installation directly buried ⁽²⁾ Ts = 20°C (A)	
			2 charged conductors	3 charged conductors
LXAV				
4 x 16	21,0	635		87
4 x 25	25,0	890		111
4 x 35	26,0	915		134
4 x 50	29,5	1 160		160
4 x 70	35,0	1 830		197
3 x 25 + 1 x 16	24,0	850		111
3 x 35 + 1 x 16 ⁽¹⁾	26,0	890		134
3 x 50 + 1 x 25 ⁽¹⁾	29,0	1 110		160
3 x 70 + 1 x 35 ⁽¹⁾	33,5	1 470		197
3 x 95 + 1 x 50 ⁽¹⁾	39,0	2 180		234
3 x 120 + 1 x 70 ⁽¹⁾	42,5	2 610		266
3 x 150 + 1 x 70 ⁽¹⁾	46,5	3 110		300
3 x 185 + 1 x 95 ⁽¹⁾	48,5	3 620		337
3 x 240 + 1 x 120 ⁽¹⁾	57,0	4 640		388

Other compositions are available, contact inform@cabelte.pt for information.

(1) Phase conductors sector shape.

(2) Thermal resistivity of soil = 1,0 K.m/W.

Singlecore cables – higher values of current may be considered depending on installation conditions.

Only one circuit is considered.

Cables with 2 and 3 conductors: 2 charged conductors.

Cables with 4 and 5 conductors: 3 charged conductors.

For compositions of 4 conductors, the same characteristics apply if the fourth conductor is the earth conductor or neutral conductor.

LOW VOLTAGE CABLE

APPLICATION

Cable for power supply, for rated voltage up to 0,6/1kV. Suitable for outdoor fixed installations when it is necessary to protect the cable against mechanical aggression or against rodents threat. Can be laid in free air, installed in ducts or directly buried.

Excellent mechanical protection during laying, installation and service.

CABLE DESIGNATION

Cu / XLPE / SWA / PVC: XRV · FXRV

Al / XLPE / SWA / PVC: LXR

F – Flexible · SWA – Steel wire armour

CONSTRUCTION CHARACTERISTICS

Conductor

Copper (plain annealed): solid class 1 or rigid stranded class 2 or class 5 (flexible), circular or sector shaped.
Aluminium: stranded class 2, circular or sector shaped.

Insulation

XLPE – (Cross-linked polyethylene).

Bedding /Inner Sheath

PVC – (Polyvinyl chloride)

Armour

Steel galvanized wires (R) helical applied.

For single core cables steel is substituted by aluminium wires (1R).

Oversheath

PVC (Polyvinyl chloride), type ST 2.

COLOUR AND CABLE MARKING

Black (or other upon request). Oversheath marked at regular intervals with the following information:
CABELTE <Cable designation> <n.^o cond.> x <cross-section> 0,6/1kV <year of manufacture> <metric marking>

IDENTIFICATION OF INSULATED CONDUCTORS

N.º of conductors		2	3	4	5
Insulation colouring (HD 308.S2)	With earth conductor	-	GNYE-BU-BN	GNYE-BN-BK-GY	GNYE-BU-BN-BK-GY
	Without earth conductor	BU-BN	BN-BK-GY	BU-BN-BK-GY	BU-BN-BK-GY-BK

GENERAL CHARACTERISTICS

Construction and test standards	IEC 60228 IEC 60502-1
Rated voltage U_0/U	0,6 / 1 kV
Test voltage	3,5 kV a.c. 5 minutes
Conductor maximum operating temperature	90°C



GENERAL CHARACTERISTICS

Maximum short-circuit temperature	250°C (t ≤ 5s)
Minimum bending radius (mm)	8 x d
Maximum pulling force over conductor (N)	Copper – 50 x S Aluminium – 30 x S
Flame retardant	IEC 60332-1-2 · EN 60332-1-2 (cable vertically mounted, length of charred cable ≤ 540 mm)
S – conductor cross-section (mm ²) · d – cable outer diameter (mm).	

ADDITIONAL CHARACTERISTICS *

Fire retardant (frt)	IEC 60332-3-24 · EN 60332-3-24 (bunch of cables vertically mounted on a ladder, length of charred cable ≤ 2,5 m)
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Oil resistant, Hidrocarbon resistance

*Can be supplied upon agreement.

ELECTRICAL AND DIMENSIONAL CHARACTERISTICS

Cable composition n.º cond. x cross-section (mm²)	Approximate outer diameter (mm)	Approximate weight (kg/km)	Current carrying capacity Installation directly buried ⁽¹⁾ Ts = 20°C (A)	
			2 charged conductors	3 charged conductors
X1RV				
1 x 10	12,5	260		87
1 x 16	13,5	330		113
1 x 25	15,0	445		144
1 x 35	17,0	600		174
1 x 50	18,5	740		206
1 x 70	20,5	970		254
1 x 95	23,0	1 290		301
1 x 120	24,5	1 560		343
1 x 150	26,5	1 850		387
1 x 185	28,0	2 230		434
1 x 240	31,0	2 820		501
1 x 300	35,0	3 610		565
1 x 400	38,5	4 530		655
1 x 500	42,5	5 510		740
XRV				
2 x 1,5	12,5	300	37	
2 x 2,5	13,5	340	48	
2 x 4	14,5	405	63	
2 x 6	16,5	585	80	
2 x 10	18,5	770	104	
2 x 16	20,5	960	136	
2 x 25	24,5	1 460	173	
2 x 35 ⁽¹⁾	22,5	1 420	208	
2 x 50 ⁽¹⁾	25,0	1 780	247	

LOW VOLTAGE CABLE

Cable composition n.º cond. x cross-section (mm ²)	Approximate outer diameter (mm)	Approximate weight (kg/km)	Current carrying capacity Installation directly buried ⁽¹⁾ Ts = 20°C (A)	
			2 charged conductors	3 charged conductors
2 x 70 ⁽¹⁾	29,0	2 490	304	
3 x 1,5	13,0	320	37	
3 x 2,5	14,0	375	48	
3 x 4	16,0	560	63	
3 x 6	17,0	660	80	
3 x 10	19,5	880	104	
3 x 16	22,0	1 250	136	
4 x 1,5	14,0	365		31
4 x 2,5	15,5	535		41
4 x 4	17,0	640		53
4 x 6	18,0	765		66
4 x 10	20,5	1 020		87
4 x 16	23,5	1 480		113
3 x 16 + 1 G 10	23,0	1 400		113
3 x 25 + 1 x 16	27,0	1 930		144
3 x 35 + 1 x 16 ⁽¹⁾	29,0	2 220		174
3 x 50 + 1 x 25 ⁽¹⁾	32,0	2 780		206
3 x 70 + 1 x 35 ⁽¹⁾	37,0	3 910		254
3 x 95 + 1 x 50 ⁽¹⁾	41,5	5 000		301
3 x 120 + 1 x 70 ⁽¹⁾	46,0	6 460		343
3 x 150 + 1 x 70 ⁽¹⁾	49,5	7 590		387
3 x 185 + 1 x 95 ⁽¹⁾	52,0	9 100		434
3 x 240 + 1 x 120 ⁽¹⁾	60,5	11 380		501
LX1RV				
1 x 16	13,5	235		87
1 x 25	15,0	300		111
1 x 35	17,0	395		134
1 x 50	18,0	455		160
1 x 70	20,0	565		197
1 x 95	23,0	725		234
1 x 120	24,0	850		266
1 x 150	26,5	990		300
1 x 185	28,5	1 160		337
1 x 240	31,0	1 380		388
1 x 300	35,0	1 540		400
1 x 400	38,5	2 130		506
1 x 500	42,0	2 540		575

Cable composition n.º cond. x cross-section (mm²)	Approximate outer diameter (mm)	Approximate weight (kg/km)	Current carrying capacity Installation directly buried ⁽²⁾ Ts = 20°C (A)	
			2 charged conductors	3 charged conductors
LXR/V				
4 x 16	23,5	1 095		87
4 x 25	27,5	1 460		111
4 x 35	29,0	1 530		134
4 x 50	33,0	2 050		160
4 x 70	37,5	2 520		197
3 x 25 + 1 x 16	27,0	1 400		111
3 x 35 + 1 x 16 ⁽¹⁾	29,0	1 520		134
3 x 50 + 1 x 25 ⁽¹⁾	32,0	1 800		160
3 x 70 + 1 x 35 ⁽¹⁾	37,0	2 490		197
3 x 95 + 1 x 50 ⁽¹⁾	41,5	3 040		234
3 x 120 + 1 x 70 ⁽¹⁾	46,0	3 920		266
3 x 150 + 1 x 70 ⁽¹⁾	49,5	4 590		300
3 x 185 + 1 x 95 ⁽¹⁾	52,0	5 260		337
3 x 240 + 1 x 120 ⁽¹⁾	60,5	6 350		388

Other compositions are available, contact inform@cabelte.pt for information.

(1) Phase conductors sector shape.

(2) Thermal resistivity of soil = 1,0 K.m/W.

Singlecore cables – higher values of current may be considered depending on installation conditions.

Only one circuit is considered.

Cables with 2 and 3 conductors: 2 charged conductors.

Cables with 4 and 5 conductors: 3 charged conductors.

For compositions of 4 conductors, the same characteristics apply if the fourth conductor is the earth conductor or neutral conductor.

LOW VOLTAGE CABLE

APPLICATION

Fire-retardant, halogen-free, high security cable, for rated voltages up to 0,6/1kV. For power transmission and distribution. Suitable for fixed outdoor connections; laid in free air or in ducts, when it is necessary to protect the cable against mechanical aggression or against rodents threat. Used in tunnels, underground railway, or in general in all places where it is required a high degree of protection of persons and assets or with a large number of people and electrical/electronic equipment.

CABLE DESIGNATION

Cu / XLPE / STA / LSHF: XAZ1 (frt,zh) · FXAZ1 (frt,zh)

Cu / XLPE / SWA / LSHF: XRZ1 (frt,zh) · FXRZ1 (frt,zh)

Al / XLPE / STA / LSHF: LXAZ1 (frt,zh)

Al / XLPE / SWA / LSHF: LXRZ1 (frt,zh)

F – Flexible · STA – Steel tape armour · SWA – Steel wire armour

CONSTRUCTION CHARACTERISTICS

Conductor

Copper (plain annealed): solid class 1 or stranded class 2 or flexible class 5, circular or sector shaped.

Aluminium: stranded class 2, circular or sector shaped.

Insulation

XLPE – (Cross-linked polyethylene).

Bedding /Inner Sheath

LSHF – Low Smoke Halogen Free thermoplastic compound.

Armour

Two steel tapes (A) helical applied - galvanized tapes if required;

Steel galvanized wires (R) helical applied;

For single core cables steel is substituted by aluminium tapes (1A or 1R).

Oversheath

LSHF – Low Smoke Halogen Free thermoplastic compound, fire retardant, type ST8.

COLOUR AND CABLE MARKING

Black (or other upon request). Oversheath marked at regular intervals with the following information:

CABELTE <Cable designation> <n.^o cond.> x <cross-section> 0,6/1kV <year of manufacture> <metric marking>

IDENTIFICATION OF INSULATED CONDUCTORS

N.º of conductors		2	3	4	5
Insulation colouring (HD 308.S2)	With earth conductor	-	GYE-BU-BN	GYE-BN-BK-GY	GYE-BU-BN-BK-GY
	Without earth conductor	BU-BN	BN-BK-GY	BU-BN-BK-GY	BU-BN-BK-GY-BK

GENERAL CHARACTERISTICS

Construction and test standards	IEC 60228 IEC 60502-1
Rated voltage U_0/U	0,6 / 1 kV



GENERAL CHARACTERISTICS

Test voltage	3,5 kV a.c. 5 minutes
Conductor maximum operating temperature	90°C
Maximum short-circuit temperature	250°C (t ≤ 5s)
Minimum bending radius (mm)	8 x d if SWA · 15 x d if STA
Maximum pulling force over conductor (N)	Copper – 50 x S Aluminium – 30 x S
Flame retardant	IEC 60332-1-2 · EN 60332-1-2 (cable vertically mounted, length of charred cable ≤ 540 mm)
Fire retardant (frt)	IEC 60332-3-24 · EN 60332-3-24 (bunch of cables vertically mounted on a ladder, length of charred cable ≤ 2,5 m)
Halogen free (zh)	
Low smoke	IEC 61034-2 · EN 61034-2 (cable light transmittance ≥ 60%)
Low toxicity	IEC 60754-1 · EN 50267-2-1 (halogen acid gas content ≤ 0,5%)
Low corrosivity	IEC 60754-2 · EN 50267-2-3 (pH ≥ 4,3 · conductivity ≤ 10µSmm ⁻¹)

S – conductor cross-section (mm²)

d – cable outer diameter (mm)

ELECTRICAL AND DIMENSIONAL CHARACTERISTICS

Cable composition n.º cond. x cross-section (mm²)	Approximate outer diameter (mm)	Approximate weight (kg/km)	Current carrying capacity Installation directly buried ⁽¹⁾ Ts = 20°C (A)	
			2 charged conductors	3 charged conductors
X1AZ1 / X1RZ1				
1 x 10	13,0 / 12,5	265 / 260	87	
1 x 16	13,5 / 13,5	335 / 330	113	
1 x 25	15,5 / 15,0	450 / 445	144	
1 x 35	16,5 / 17,0	555 / 600	174	
1 x 50	18,0 / 18,5	695 / 740	206	
1 x 70	20,0 / 20,5	915 / 970	254	
1 x 95	21,5 / 23,0	1 180 / 1 290	301	
1 x 120	23,5 / 24,5	1 440 / 1 560	343	
1 x 150	25,0 / 26,5	1 710 / 1 850	387	
1 x 185	26,5 / 28,0	2 080 / 2 230	434	
1 x 240	29,5 / 31,0	2 660 / 2 820	501	
1 x 300	33,0 / 35,0	3 350 / 3 610	565	
1 x 400	36,0 / 38,5	4 210 / 4 530	655	
1 x 500	40,0 / 42,5	5 170 / 5 510	740	
XAZ1 / XRZ1				
2 x 1,5	11,5 / 12,5	220 / 300	37	
2 x 2,5	12,5 / 13,5	260 / 340	48	
2 x 4	13,5 / 14,5	315 / 405	63	
2 x 6	14,5 / 16,5	380 / 585	80	
2 x 10	16,5 / 18,5	525 / 770	104	
2 x 16	18,5 / 20,5	690 / 960	136	

LOW VOLTAGE CABLE

Cable composition n.º cond. x cross-section (mm ²)	Approximate outer diameter (mm)	Approximate weight (kg/km)	Current carrying capacity Installation directly buried ⁽¹⁾ Ts = 20°C (A)	
			2 charged conductors	3 charged conductors
2 x 25	22,0 / 24,5	990 / 1 460	173	
2 x 35 ⁽¹⁾	20,0 / 22,5	980 / 1 420	208	
2 x 50 ⁽¹⁾	22,0 / 25,0	1 270 / 1 780	247	
2 x 70 ⁽¹⁾	25,0 / 29,0	1 720 / 2 490	304	
3 x 1,5	12,0 / 13,0	240 / 320	37	
3 x 2,5	13,0 / 14,0	290 / 375	48	
3 x 4	14,0 / 16,0	360 / 560	63	
3 x 6	15,0 / 17,0	440 / 660	80	
3 x 10	17,5 / 19,5	620 / 880	104	
3 x 16	19,5 / 22,0	835 / 1 250	136	
4 x 1,5	13,0 / 14,0	275 / 365		31
4 x 2,5	13,5 / 15,5	330 / 535		41
4 x 4	15,0 / 17,0	415 / 640		53
4 x 6	16,0 / 18,0	520 / 765		66
4 x 10	18,5 / 20,5	740 / 1 020		87
4 x 16	21,0 / 23,5	1 020 / 1 480		113
3 x 16 + 1 G 10	20,5 / 23,0	960 / 1 400		113
3 x 25 + 1 x 16	24,0 / 27,0	1 390 / 1 930		144
3 x 35 + 1 x 16 ⁽¹⁾	26,0 / 29,0	1 600 / 2 220		174
3 x 50 + 1 x 25 ⁽¹⁾	29,0 / 32,0	2 110 / 2 780		206
3 x 70 + 1 x 35 ⁽¹⁾	33,5 / 37,0	2 890 / 3 910		254
3 x 95 + 1 x 50 ⁽¹⁾	39,0 / 41,5	4 190 / 5 000		301
3 x 120 + 1 x 70 ⁽¹⁾	42,5 / 46,0	5 150 / 6 460		343
3 x 150 + 1 x 70 ⁽¹⁾	46,5 / 49,5	6 200 / 7 590		387
3 x 185 + 1 x 95 ⁽¹⁾	48,5 / 52,0	7 640 / 9 100		434
3 x 240 + 1 x 120 ⁽¹⁾	57,0 / 60,5	9 670 / 11 380		501
LX1AZ1 / LX1RZ1				
1 x 16	13,5 / 13,5	240 / 235		87
1 x 25	15,5 / 15,0	305 / 300		111
1 x 35	16,5 / 17,0	350 / 395		134
1 x 50	17,5 / 18,0	410 / 455		160
1 x 70	19,5 / 20,0	510 / 565		197
1 x 95	21,5 / 23,0	615 / 725		234
1 x 120	23,0 / 24,0	730 / 850		266
1 x 150	25,0 / 26,5	850 / 990		300
1 x 185	27,0 / 28,5	1 010 / 1 160		337
1 x 240	29,5 / 31,0	1 220 / 1 380		388
1 x 300	33,0 / 35,0	1 480 / 1 540		400
1 x 400	36,0 / 38,5	1 810 / 2 130		506
1 x 500	39,5 / 42,0	2 200 / 2 540		575

Cable composition n.º cond. x cross-section (mm ²)	Approximate outer diameter (mm)	Approximate weight (kg/km)	Current carrying capacity Installation directly buried ⁽²⁾ Ts = 20°C (A)	
			2 charged conductors	3 charged conductors
LXAZ1 / LXRZ1				
4 x 16	21,0 / 23,5	635 / 1 095		87
4 x 25	25,0 / 27,5	890 / 1 460		111
4 x 35 ⁽¹⁾	26,0 / 29,0	915 / 1 530		134
4 x 50 ⁽¹⁾	29,5 / 33,0	1 160 / 2 050		160
4 x 70 ⁽¹⁾	35,0 / 37,5	1 830 / 2 520		197
3 x 25 + 1 x 16	24,0 / 27,0	850 / 1 400		111
3 x 35 + 1 x 16 ⁽¹⁾	26,0 / 29,0	890 / 1 520		134
3 x 50 + 1 x 25 ⁽¹⁾	29,0 / 32,0	1 110 / 1 800		160
3 x 70 + 1 x 35 ⁽¹⁾	33,5 / 37,0	1 470 / 2 490		197
3 x 95 + 1 x 50 ⁽¹⁾	39,0 / 41,5	2 180 / 3 040		234
3 x 120 + 1 x 70 ⁽¹⁾	42,5 / 46,0	2 610 / 3 920		266
3 x 150 + 1 x 70 ⁽¹⁾	46,5 / 49,5	3 110 / 4 590		300
3 x 185 + 1 x 95 ⁽¹⁾	48,5 / 52,0	3 620 / 5 260		337
3 x 240 + 1 x 120 ⁽¹⁾	57,0 / 60,5	4 640 / 6 350		388

Other compositions are available, contact inform@cabelte.pt for information.

(1) Phase conductors sector shape.

(2) Thermal resistivity of soil = 1,0 K.m/W.

Singlecore cables – higher values of current may be considered depending on installation conditions.

Only one circuit is considered.

Cables with 2 and 3 conductors: 2 charged conductors.

Cables with 4 and 5 conductors: 3 charged conductors.

For compositions of 4 conductors, the same characteristics apply if the fourth conductor is the earth conductor or neutral conductor.

LOW VOLTAGE CABLE

APPLICATION

Cable for overhead power distribution systems mainly for public distribution, for rated voltage up to 0,6/1kV.

CABLE DESIGNATION

Cu / XLPE: **XS** (NP 3528, HD 626) • **RZ** (UNE 21030-2)

Al / XLPE: **LXS** (NP 3528, HD 626) • **RZ AL** (UNE 21030-1)

CONSTRUCTION CHARACTERISTICS

Phase conductors and public lighting conductors

Copper (plain annealed): Solid class 1; rigid stranded class 2.

Aluminium: stranded class 2.

Outer layer stranding direction: Right-hand (Z) for RZ and RZ AL.

Outer layer stranding direction: Left-hand (S) for XS and LXS.

Messenger neutral core

When applicable – Stranded aluminium alloy wires, cross-sections 29,5 mm²; 54,6 mm² and 80 mm²:

Outer layer stranding direction: Right-hand (Z) for RZ and RZ AL.

Insulation

XLPE – (Cross-linked polyethylene).

Assembly of cores

Cores are laid-up helically.

For cables having a messenger, the phase and auxiliary cores are cabled helically around it.

Stranding direction: Left-hand (S) for RZ and RZ AL.

Stranding direction: Right-hand (Z) for XS and LXS.

COLOUR AND CABLE MARKING

Black (or other upon request). Oversheath marked at regular intervals with the following information:

Neutral conductor: CABELTE <year of manufacture> <Cable designation> 0,6/1kV <composition>

Phase conductors: <Numbering of each conductor> <year of manufacture>

GENERAL CHARACTERISTICS

Construction and test standards	NP 3528
	HD 626 4-J e 6-J
	UNE 21030-1/2
Rated voltage U_0/U	0,6 / 1 kV
Test voltage	4 kV a.c. 5 minutes
Conductor maximum operating temperature	90°C
Maximum short-circuit temperature	250°C (t ≤ 5s)
Minimum bending radius (mm)	18 x d
Maximum pulling force over conductor (N)	With sleeve over copper conductors – 50 x S
	With sleeve over aluminium conductors – 30 x S
Excellent resistance to external agents	

S – conductor cross-section (mm²) • d – cable outer diameter (mm)



MECHANICAL AND ELECTRICAL CHARACTERISTICS

Material	Cross section (mm ²)	Minimum breaking load (daN)	Electrical resist. d.c. 20°C (Ω/km)
Copper	4	80	4,61
	6	120	3,08
	10	210	1,83
	16	–	1,15
Aluminium	16	190	1,91
	25	300	1,2
	35	420	0,868
	50	600	0,641
	70	840	0,443
	95	1 140	0,320
	150	1 800	0,206
Aluminium alloy	29,5	870	1,150
	54,6	1 660	0,630
	80	2 000	0,437

ELECTRICAL AND DIMENSIONAL CHARACTERISTICS

Cable composition n.º cond. x cross-section (mm ²)	Standards	Approximate outer diameter (mm)	Approximate weight (kg/km)	Maximum permissible current Installation in open air T = 40°C (A)
Copper XS · RZ				
2 x 2,5	UNE	9	65	25
2 x 4	UNE / NP	10	95	35
2 x 6	UNE / NP	12	135	55
2 x 10	UNE / NP	13	215	75
2 x 16	UNE	15	325	100
3 x 4	UNE	11	140	30
3 x 4 + 2 x 2,5	UNE	13	210	30
3 x 6	UNE / NP	13	205	50
3 x 6 + 2 x 2,5	UNE	14	270	48
3 x 10	NP	14	320	70
4 x 4	UNE	11	190	30
4 x 6	UNE / NP	14	275	50
4 x 6 + 2 x 2,5	UNE	19	345	48
4 x 10	UNE / NP	16	430	70
4 x 10 + 2 x 2,5	UNE	18	490	68
4 x 16	UNE	18	650	95
4 x 16 + 10	UNE	20	755	95
5 x 4	UNE	13	245	30
5 x 4 + 2 x 2,5	UNE	15	310	28
5 x 6	UNE	15	340	50
5 x 6 + 2 x 2,5	UNE	19	410	48
5 x 10	UNE	18	530	70
5 x 10 + 2 x 2,5	UNE	18	595	68
5 x 16	UNE	20	800	95
5 x 16 + 2 x 2,5	UNE	21	850	93

LOW VOLTAGE CABLE

Cable composition n.º cond. x cross-section (mm ²)	Standards	Approximate outer diameter (mm)	Approximate weight (kg/km)	Maximum permissible current Installation in open air T = 40°C (A)
Aluminium LXS · RZ AL				
2 x 16	UNE / NP	15	130	85
2 x 25	UNE	18	200	110
1 x 25 / 54,6	UNE	22	310	110
3 x 16	NP	16	195	75
4 x 16	UNE / NP	18	260	75
5 x 16	NP	20	325	75
6 x 16	NP	22	390	75
4 x 25	UNE / NP	22	395	100
4 x 25 + 1 x 16	NP	24	460	100
4 x 25 + 2 x 16	NP	26	525	100
3 x 25 + 29,5	UNE	24	415	100
3 x 25 + 54,6	UNE / NP	23	500	100
3 x 25 + 54,6 + 1 x 16	NP	25	570	100
3 x 25 + 54,6 + 2 x 16	NP	27	635	100
4 x 35	NP	26	550	120
4 x 35 + 1 x 16	NP	27	615	120
4 x 35 + 2 x 16	NP	27	680	120
3 x 35 + 54,6	NP	27	620	120
3 x 35 + 54,6 + 1 x 16	NP	29	685	120
3 x 35 + 54,6 + 2 x 16	NP	32	750	120
4 x 50	UNE / NP	29	705	150
4 x 50 + 1 x 16	NP	30	770	150
4 x 50 + 1 x 25	NP	31	800	150
4 x 50 + 2 x 16	NP	31	835	150
4 x 50 + 2 x 25	NP	32	900	150
1 x 50 + 54,6	UNE	25	385	165
3 x 50 + 29,5	UNE	28	640	150
3 x 50 + 54,6	UNE / NP	30	735	150
3 x 50 + 54,6 + 1 x 16	NP	31	800	150
3 x 50 + 54,6 + 1 x 25	NP	32	835	150
3 x 50 + 54,6 + 2 x 16	NP	33	865	150
3 x 50 + 54,6 + 2 x 25	NP	34	935	150
4 x 70	NP	33	1 005	190
4 x 70 + 1 x 16	NP	34	1 070	190
4 x 70 + 1 x 25	NP	35	1 105	190
4 x 70 + 2 x 16	NP	36	1 135	190
4 x 70 + 2 x 25	NP	36	1 205	190
3 x 70 + 54,6	NP	33	960	190
3 x 70 + 54,6 + 1 x 16	NP	34	1 030	190
3 x 70 + 54,6 + 1 x 25	NP	35	1 060	190
3 x 70 + 54,6 + 2 x 16	NP	36	1 095	190
3 x 70 + 54,6 + 2 x 25	NP	36	1 160	190
4 x 95	NP	37	1 325	230

Cable composition n.º cond. x cross-section (mm²)	Standards	Approximate outer diameter (mm)	Approximate weight (kg/km)	Maximum permissible current Installation in open air T = 40°C (A)
4 x 95 + 1 x 16	NP	38	1 390	230
4 x 95 + 1 x 25	NP	38	1 420	230
4 x 95 + 2 x 16	NP	40	1 455	230
4 x 95 + 2 x 25	NP	40	1 520	230
3 x 95 + 54,6	UNE / NP	37	1 200	230
3 x 95 + 50	UNE	37	1 880	230
3 x 95 + 54,6 + 1 x 16	NP	38	1 265	230
3 x 95 + 54,6 + 1 x 25	NP	38	1 300	230
3 x 95 + 54,6 + 2 x 16	NP	40	1 330	230
3 x 95 + 54,6 + 2 x 25	NP	40	1 400	230
3 x 150 + 95	UNE	44	1 800	305
3 x 150 + 80	UNE	43	1 755	305

MEDIUM VOLTAGE CABLES

SINGLE CORE CABLE

Unarmoured, Cross-linked Polyethylene Insulation – XLPE

- Standard IEC 60502-2
CU or AL / XLPE / CU / PVC or PE
- Flame retardant, Halogen free
CU or AL / XLPE / CU / PO
- Fire retardant, Halogen free
CU or AL / XLPE / CU / PO
- Standard BS 7870-4.10
CU or AL / XLPE / CU / PE
- Aluminium screen
Cu or AL / XLPE / AL / PE
- Reinforced transversal watertightness
CU or AL / XLPE / CU / AL / PE

Unarmoured, Ethylene Propylene Rubber, Insulation – EPR

- Standard IEC 60502-2
CU or AL / EPR / CU / PVC or PE

Armoured, Cross-linked Polyethylene Insulation – XLPE

- Standard IEC 60502-2
CU or AL / XLPE / CU / ATA or AWA / PVC or PE

THREE CORE CABLE

Unarmoured, Cross-linked Polyethylene Insulation – XLPE

- Standard IEC 60502-2
CU or AL / XLPE / CU / PVC or PE
- Standard BS 7870-4.20
AL / XLPE / CU / PE

Armoured, Cross-linked Polyethylene Insulation – XLPE

- Standard IEC 60502-2
CU or AL / XLPE / CU / STA or SWA / PVC or PE

THREE CORE BUNDLE CABLE

Cross-linked Polyethylene Insulation – XLPE

- Without messenger
CU or AL / XLPE / CU / PVC or PE
- With messenger
AL / XLPE / CU / PVC or PE

HIGH VOLTAGE CABLES

- XHIOLE (cbe) • LXHIOLE (cbe)

MEDIUM VOLTAGE CABLE

APPLICATION

Cable for power distribution and power supply stations used in Utility and Industrial applications, for rated voltages up to 18/30kV. Suitable for fixed installations, indoor or outdoor, in open air on cable trays, or underground in ducts or directly buried.

CABLE DESIGNATION

Cu / XLPE / Cu Tape screen / PVC or PE: **XHIV • XHIE**

Cu / XLPE / Cu Wire screen / PVC or PE: **XHIOV • XHIOE**

Al / XLPE / Cu Tape screen / PVC or PE: **LXHIV • LXHIE**

Al / XLPE / Cu Wire screen / PVC or PE: **LXHIOV • LXHIOE**

Watertight constructions: **XHIOE(be)** or **XHIOE(cbe)**

Watertight constructions: **LXHIOE(be)** or **LXHIOE(cbe)**

CONSTRUCTION CHARACTERISTICS

Conductor

Plain annealed Copper or Aluminium, circular, stranded, class 2 per IEC 60228.

Insulation

Semi-conductive screen over the conductor, XLPE (cross-linked polyethylene) insulation and Semi-conductive screen over the insulation (strippable¹), applied by simultaneous extrusion in just one operation.

(1) Bonded upon agreement.

Metallic Screen

Copper wire screen – annealed copper wires helically wound and an equalising copper tape applied in an open counter-helix.

Plastic tape is applied over the screen.

Or **Copper tape screen** – a copper tape, standard thickness 0,1 mm helically applied with overlap.

Oversheath

Extruded PVC, type ST2 or PE type ST7.

Upon agreement, an extruded semi-conductive thin layer may be applied on the surface of the oversheath, to facilitate the detection and location of defective points.

Watertightness option

(be) – Metallic screen longitudinally watertight. Assured by application of a waterblocking tape over the metallic screen. A waterblocking yarn under the screen may be considered.

(cbe) – Conductor and metallic screen longitudinally watertight. Conductor: assured by waterblocking yarns and / or tapes between wire layers; Metallic screen: assured by application of a waterblocking tape over metallic screen. A waterblocking yarn under the screen may be considered.

COLOUR AND CABLE MARKING

Black (other upon agreement).

Oversheath marked at regular intervals with the following information:

CABELTE <cable designation> 1 x <cond. cross-section>/<screen cross-section (if copper wires screen)>

<rated voltage> <order of manufacture>/<year of manufacture> <metric marking>



GENERAL CHARACTERISTICS

Construction and test standards	IEC 60228 • IEC 60502-2
Rated voltage $U_0/U(\text{Um})$	3,6/6 (7,2) kV • 6/10 (12) kV • 8,7/15 (17,5) kV • 12/20 (24) kV • 18/30 (36) kV
Standard cross-section of wire screen	16 • 25 • 30 • 35
Test voltage	3,5 x U_0
Conductor maximum operating temperature	90°C
Maximum short-circuit temperature	250°C ($t \leq 5\text{s}$)
Minimum bending radius – during installation (mm)	20 x d
Minimum bending radius – after installation (mm)	15 x d
Maximum pulling force over conductor (N)	Copper – 50 x S Aluminium – 30 x S
Flame retardant (for PVC oversheath)	IEC 60332-1-2 • EN 60332-1-2 (cable vertically mounted, length of charred cable ≤ 540 mm)
Fire retardant (for PVC oversheath, upon agreement)	IEC 60332-3-24 • EN 60332-3-24 (bunch of cables vertically mounted on a ladder, length of charred cable $\leq 2,5$ m)

S – conductor cross-section (mm^2) • d – cable outer diameter (mm)

ELECTRICAL AND DIMENSIONAL CHARACTERISTICS

Copper conductor constructions

Voltage		Conductor cross-section	Diameter over insulation	Approx. outer diameter	Approx. weight XHIOV	Current carrying capacity 		Cond. max. short-circuit current, t=1s	Cond. DC resistance @ 20°C	Inductance 	Capacitance
U ₀ / U (kV)	Um (kV)					In air (A)	Buried (A)				
Copper conductor											
3,6/6	7,2	25	13,0	20,0	655	157	160	3,6	0,7270	0,41	0,27
		35	14,0	21,0	770	190	191	5,0	0,5240	0,39	0,30
		50	15,0	22,5	905	229	227	7,5	0,3870	0,37	0,33
		70	16,5	24,0	1 120	286	278	10,0	0,2680	0,35	0,38
		95	18,5	26,0	1 400	350	333	13,6	0,1930	0,33	0,43
		120	20,0	28,0	1 675	406	380	17,2	0,1530	0,32	0,48
		150	21,0	29,0	1 930	461	426	21,5	0,1240	0,31	0,51
		185	22,5	30,5	2 305	526	481	26,5	0,0991	0,30	0,54
		240	25,5	33,5	2 885	630	560	34,3	0,0754	0,29	0,60
		300	28,5	37,0	3 555	731	634	42,9	0,0601	0,28	0,63
		400	32,0	40,5	4 505	851	721	57,2	0,0470	0,28	0,66
6/10	12	500	35,5	44,0	5 480	986	816	71,5	0,0366	0,27	0,69
		630	41,0	47,5	7 110	1 135	921	90,1	0,0283	0,27	0,76
		25	15,0	22,0	730	160	160	3,6	0,7270	0,43	0,22
		35	16,0	23,0	835	194	191	5,0	0,5240	0,41	0,24
		50	17,0	24,5	985	233	226	7,5	0,3870	0,39	0,27
		70	18,5	26,0	1 210	291	278	10,0	0,2680	0,36	0,30
		95	20,5	28,0	1 500	355	333	13,6	0,1930	0,35	0,34

MEDIUM VOLTAGE CABLE

Cu or Al · XLPE · Cu · PVC or PE

Single Core Cable

Unarmoured · XLPE Insulation · IEC 60502-2

Voltage		Conductor cross-section (mm²)	Diameter over insulation (mm)	Approx. outer diameter (mm)	Approx. weight XHIOV (kg/km)	Current carrying capacity 		Cond. max. short-circuit current, t=1s (kA)	Cond. DC resistance @ 20°C (Ω/km)	Inductance  (mH/km)	Capacitance (μF/km)
U ₀ / U (kV)	Um (kV)					In air (A)	Buried (A)				
Copper conductor											
6/10	12	150	23,0	31,0	2 040	466	426	21,5	0,1240	0,32	0,39
		185	24,5	32,5	2 405	532	480	26,5	0,0991	0,32	0,42
		240	27,0	35,5	2 990	634	559	34,3	0,0754	0,30	0,48
		300	30,0	38,0	3 640	733	633	42,9	0,0601	0,29	0,53
		400	33,0	41,5	4 580	853	720	57,2	0,0470	0,28	0,59
		500	36,0	44,5	5 530	987	817	71,5	0,0366	0,27	0,65
		630	41,5	48,0	7 140	1 136	920	90,1	0,0283	0,27	0,72
8,7/15	17,5	25	17,0	24,5	820	163	159	3,6	0,7270	0,45	0,18
		35	18,0	25,5	930	197	191	5,0	0,5240	0,43	0,20
		50	19,0	26,5	1 075	236	226	7,5	0,3870	0,41	0,21
		70	21,0	28,5	1 320	295	277	10,0	0,2680	0,38	0,24
		95	22,5	30,5	1 595	359	333	13,6	0,1930	0,36	0,27
		120	24,5	32,0	1 880	416	379	17,2	0,1530	0,35	0,29
		150	25,5	33,5	2 145	471	425	21,5	0,1240	0,34	0,31
		185	26,5	35,0	2 535	537	479	26,5	0,0991	0,33	0,33
		240	29,5	37,5	3 130	639	558	34,3	0,0754	0,32	0,38
		300	32,0	40,5	3 775	738	632	42,9	0,0601	0,30	0,42
		400	35,0	43,5	4 720	858	720	57,2	0,0470	0,29	0,46
		500	38,0	47,0	5 685	993	817	71,5	0,0366	0,28	0,51
		630	44,0	50,5	7 315	1 143	922	90,1	0,0283	0,28	0,56
12/20	24	35	20,0	27,5	1 025	199	191	5,0	0,5240	0,44	0,17
		50	21,0	29,0	1 170	239	226	7,5	0,3870	0,42	0,19
		70	23,0	31,0	1 425	298	277	10,0	0,2680	0,40	0,21
		95	24,5	32,5	1 705	362	332	13,6	0,1930	0,38	0,23
		120	26,5	34,5	2 000	419	379	17,2	0,1530	0,36	0,25
		150	27,5	35,5	2 270	474	424	21,5	0,1240	0,35	0,27
		185	28,5	37,0	2 660	541	479	26,5	0,0991	0,34	0,28
		240	31,5	39,5	3 250	643	557	34,3	0,0754	0,33	0,32
		300	34,0	42,5	3 920	742	631	42,9	0,0601	0,32	0,35
		400	37,0	45,5	4 880	862	720	57,2	0,0470	0,30	0,39
		500	40,0	49,0	5 855	997	817	71,5	0,0366	0,29	0,43
				630	46,0	52,5	7 510	1 153	928	90,1	0,0283
18/30	36	50	26,0	34,5	1 445	244	225	7,5	0,3870	0,46	0,14
		70	28,0	36,0	1 695	303	276	10,0	0,2680	0,43	0,16
		95	29,5	38,0	2 015	368	331	13,6	0,1930	0,41	0,18
		120	31,5	39,5	2 300	425	377	17,2	0,1530	0,39	0,19
		150	32,5	41,0	2 600	481	422	21,5	0,1240	0,38	0,20
		185	33,5	42,0	2 985	547	474	26,5	0,0991	0,37	0,21
		240	36,5	45,0	3 620	649	556	34,3	0,0754	0,35	0,24
		300	39,0	48,0	4 315	748	630	42,9	0,0601	0,34	0,26
		400	42,0	51,0	5 305	868	718	57,2	0,0470	0,33	0,29
		500	45,0	54,5	6 310	1 003	816	71,5	0,0366	0,32	0,31
				630	51,0	58,0	8 010	1 154	923	90,1	0,0283

Aluminium conductor constructions

Voltage		Conductor cross-section	Diameter over insulation	Approx. outer diameter	Approx. weight LXHIOV	Current carrying capacity 		Cond. max. short-circuit current, t=1s	Cond. DC resistance @ 20°C	Inductance 	Capacitance
U _o / U (kV)	Um (kV)					In air (A)	Buried (A)				
Aluminium conductor											
3,6/6	7,2	25	12,5	20,0	505	121	124	2,4	1,2000	0,41	0,27
		35	13,5	21,0	560	147	148	3,3	0,8680	0,39	0,30
		50	15,0	22,0	615	176	175	4,7	0,6410	0,37	0,33
		70	16,5	24,0	705	221	215	6,6	0,4430	0,35	0,38
		95	18,0	25,5	830	270	258	9,0	0,3200	0,33	0,42
		120	20,0	27,5	950	315	295	11,3	0,2530	0,32	0,47
		150	21,0	29,0	1 055	357	331	14,2	0,2060	0,31	0,51
		185	22,5	30,5	1 205	411	375	17,5	0,1640	0,30	0,55
		240	25,5	33,5	1 425	489	436	22,7	0,1250	0,29	0,60
		300	28,5	37,0	1 695	571	495	28,3	0,1000	0,28	0,63
		400	32,0	40,0	2 055	670	567	37,8	0,0778	0,28	0,66
		500	35,0	43,5	2 450	782	649	47,2	0,0605	0,27	0,69
		630	40,0	49,0	3 040	925	746	59,5	0,0469	0,26	0,79
6/10	12	25	14,5	22,0	575	124	124	2,4	1,2000	0,43	0,22
		35	15,5	23,0	630	150	148	3,3	0,8680	0,41	0,24
		50	17,0	24,5	700	179	175	4,7	0,6410	0,39	0,26
		70	18,5	26,0	795	225	215	6,6	0,4430	0,37	0,30
		95	20,0	28,0	925	274	258	9,0	0,3200	0,35	0,33
		120	22,0	29,5	1 040	319	295	11,3	0,2530	0,33	0,37
		150	23,0	31,0	1 165	361	330	14,2	0,2060	0,32	0,39
		185	24,5	32,5	1 305	415	374	17,5	0,1640	0,31	0,43
		240	27,0	35,0	1 525	493	435	22,7	0,1250	0,30	0,47
		300	30,0	38,0	1 785	573	495	28,3	0,1000	0,29	0,53
		400	32,5	41,0	2 125	671	567	37,8	0,0778	0,28	0,59
		500	35,5	44,5	2 500	783	649	47,2	0,0605	0,28	0,65
		630	40,5	49,0	3 070	926	745	59,5	0,0469	0,27	0,75
8,7/15	17,5	25	17,0	24,5	665	126	124	2,4	1,2000	0,45	0,18
		35	18,0	25,5	720	152	148	3,3	0,8680	0,43	0,19
		50	19,0	26,5	785	182	175	4,7	0,6410	0,41	0,21
		70	20,5	28,5	900	228	215	6,6	0,4430	0,38	0,24
		95	22,5	30,0	1 020	277	257	9,0	0,3200	0,36	0,27
		120	24,0	32,0	1 160	322	294	11,3	0,2530	0,35	0,29
		150	25,5	33,5	1 270	365	330	14,2	0,2060	0,34	0,31
		185	27,0	35,0	1 435	419	373	17,5	0,1640	0,33	0,34
		240	29,0	37,5	1 665	496	434	22,7	0,1250	0,32	0,37
		300	32,0	40,5	1 915	577	494	28,3	0,1000	0,30	0,42
		400	35,0	43,5	2 270	675	566	37,8	0,0778	0,29	0,46
		500	38,0	46,5	2 655	787	648	47,2	0,0605	0,29	0,51
		630	42,5	51,5	3 240	929	745	59,5	0,0469	0,27	0,58

MEDIUM VOLTAGE CABLE

Voltage		Conductor cross-section	Diameter over insulation	Approx. outer diameter	Approx. weight LXHIOV	Current carrying capacity 		Cond. max. short-circuit current, t=1s	Cond. DC resistance @ 20°C	Inductance 	Capacitance
U ₀ / U (kV)	Um (kV)					In air (A)	Buried (A)				
Aluminium conductor											
12/20	24	35	20,0	27,5	815	154	148	3,3	0,8680	0,44	0,17
		50	21,0	28,5	880	184	175	4,7	0,6410	0,42	0,18
		70	22,5	30,5	1 005	230	215	6,6	0,4430	0,40	0,21
		95	24,5	32,5	1 130	280	257	9,0	0,3200	0,38	0,23
		120	26,0	34,0	1 275	325	294	11,3	0,2530	0,36	0,25
		150	27,5	35,5	1 395	368	329	14,2	0,2060	0,35	0,27
		185	29,0	37,0	1 565	422	373	17,5	0,1640	0,34	0,29
		240	31,0	39,5	1 785	499	434	22,7	0,1250	0,33	0,32
		300	34,0	42,5	2 065	579	493	28,3	0,1000	0,32	0,35
		400	37,0	45,5	2 425	677	566	37,8	0,0778	0,30	0,39
18/30	36	500	40,0	48,5	2 825	789	647	47,2	0,0605	0,30	0,43
		630	44,5	53,5	3 425	930	744	59,5	0,0469	0,28	0,49
		50	26,0	34,0	1 155	188	174	4,7	0,6410	0,46	0,14
		70	27,5	36,0	1 275	234	214	6,6	0,4430	0,43	0,16
		95	29,5	37,5	1 435	285	256	9,0	0,3200	0,41	0,17
		120	31,0	39,5	1 575	330	293	11,3	0,2530	0,39	0,19
		150	32,5	41,0	1 725	373	327	14,2	0,2060	0,38	0,20
		185	34,0	42,5	1 890	427	371	17,5	0,1640	0,37	0,21
		240	36,0	45,0	2 150	504	432	22,7	0,1250	0,36	0,24
		300	39,0	48,0	2 460	584	491	28,3	0,1000	0,34	0,26
400	42,0	51,0	2 850	681	564	37,8	0,0778	0,33	0,29		
500	45,0	54,0	3 275	792	646	47,2	0,0605	0,32	0,31		
630	49,5	59,0	3 920	933	743	59,5	0,0469	0,30	0,35		

Other compositions are available, contact inform@cabelte.pt for information.

Current carrying capacity calculated considering the following conditions:

Maximum conductor temperature = 90°C

Cables in air: Ambient temperature = 30°C

Cables directly buried: Ground temperature = 20°C • Depth of laying = 0,7m • Thermal resistivity of soil = 1,0 K.m/W

MEDIUM VOLTAGE CABLE

APPLICATION

Cable for power distribution and power supply stations, halogen free and flame retardant used in Utility and Industrial applications, for rated voltages up to 18/30kV.

Applicable for installations where it is necessary to guarantee improved fire behaviour. Suitable for fixed installations, indoor or outdoor, in open air on cable trays, or underground in ducts or directly buried.

Special oversheath compound guarantees low water absorption properties and improved mechanical performance (tear resistance, tensile strength and elongation at break) compared to LSHF standard materials.

CABLE DESIGNATION

Cu / XLPE / Cu Tape screen / PO: **XHIZ1**

Al / XLPE / Cu Tape screen / PO: **LXHIZ1**

Cu / XLPE / Cu Wire screen / PO: **XHIOZ1**

Al / XLPE / Cu Wire screen / PO: **LXHIOZ1**

CONSTRUCTION CHARACTERISTICS

Conductor

Plain annealed Copper or Aluminium, circular, stranded, class 2 per IEC 60228.

Insulation

Semi-conductive screen over the conductor, XLPE (cross-linked polyethylene) insulation and semi-conductive screen over the insulation (strippable¹), applied by simultaneous extrusion in just one operation.

(1) Bonded upon agreement.

Metallic Screen

Copper wire screen – annealed copper wires helically wound and an equalising copper tape applied in an open counter-helix.

Plastic tape is applied over the screen.

Or **Copper tape screen** – a copper tape, standard thickness 0,1 mm helically applied with overlap.

Oversheath

Polyolefin type DMZ2 according to HD 620 S2 – LSHF – Low Smoke Halogen Free thermoplastic compound, flame retardant.

COLOUR AND CABLE MARKING

Black (other upon agreement). Oversheath marked at regular intervals with the following information:
CABELTE <cable designation> 1 x <cond. cross-section>/<screen cross-section (if copper wires screen)>
<rated voltage> <order of manufacture>/<year of manufacture> <metric marking>

GENERAL CHARACTERISTICS

Construction and test standards	IEC 60228
	IEC 60502-2 · HD 620 S2
Rated voltage U_0 / $U(U_m)$	3,6/6 (7,2) kV · 6/10 (12) kV · 8,7/15 (17,5) kV · 12/20 (24) kV · 18/30 (36) kV
Standard cross-section of wire screen	16 · 25 · 30 · 35
Test voltage	3,5 x U_0
Conductor maximum operating temperature	90°C



Maximum short-circuit temperature	250°C (t ≤ 5s)
Minimum bending radius – during installation (mm)	20 x d
Minimum bending radius – after installation (mm)	15 x d
Maximum pulling force over conductor (N)	Copper – 50 x S Aluminium – 30 x S
Flame retardant	IEC 60332-1-2 • EN 60332-1-2 (cable vertically mounted, length of charred cable ≤ 540 mm)

S – conductor cross-section (mm²)
d – cable outer diameter (mm)

ELECTRICAL AND DIMENSIONAL CHARACTERISTICS

Dimensional and electrical characteristics can be consulted in the corresponding table (whether copper or aluminium conductors) of single core XLPE unarmoured cables.

MEDIUM VOLTAGE CABLE

APPLICATION

Cable for power distribution and power supply stations, halogen free and fire retardant used in Utility and Industrial applications, for rated voltages up to 18/30kV.

Applicable for installations of high security in relation to fire, namely tunnels, underground railways.

Suitable for fixed installations, indoor or outdoor, in open air on cable trays, or underground in ducts or directly buried.

Special oversheath compound guarantees low water absorption properties and improved mechanical performance (tear resistance, tensile strength and elongation at break) compared to LSHF standard materials.

CABLE DESIGNATION

Cu / XLPE / Cu Tape screen / PO: **XHIZ1 (frt,zh)**

Al / XLPE / Cu Tape screen / PO: **LXHIZ1 (frt,zh)**

Cu / XLPE / Cu Wire screen / PO: **XHIOZ1 (frt,zh)**

Al / XLPE / Cu Wire screen / PO: **LXHIOZ1 (frt,zh)**

CONSTRUCTION CHARACTERISTICS

Conductor

Plain annealed Copper or Aluminium, circular, stranded, class 2 per IEC 60228.

Insulation

Semi-conductive screen over the conductor, XLPE (cross-linked polyethylene) insulation and semi-conductive screen over the insulation (strippable¹), applied by simultaneous extrusion in just one operation.

(1) Bonded upon agreement.

Metallic Screen

Copper wire screen – annealed copper wires helically wound and an equalising copper tape applied in an open counter-helix.

Plastic tape is applied over the screen.

Or **Copper tape screen** – a copper tape, standard thickness 0,1 mm helically applied with overlap.

Bedding for Fire retardant category B

LSHF – Low Smoke Halogen Free thermoplastic compound, fire retardant.

Oversheath

Polyolefin type DMZ2 according to HD 620 S2 – **LSHF** – Low Smoke Halogen Free thermoplastic compound, flame retardant or **LSHF** – Low Smoke Halogen Free thermoplastic compound, fire retardant type ST8 for fire retardant category C.

COLOUR AND CABLE MARKING

Black (other upon agreement). Oversheath marked at regular intervals with the following information:
CABELTE <cable designation> 1 x <cond. cross-section>/<screen cross-section (if copper wires screen)>
<rated voltage> <order of manufacture>/<year of manufacture> <metric marking>

GENERAL CHARACTERISTICS

Construction and test standards	IEC 60228
	IEC 60502-2 • HD 620 S2
Rated voltage U_0 / $U(U_m)$	3,6/6 (7,2) kV • 6/10 (12) kV • 8,7/15 (17,5) kV •
	12/20 (24) kV • 18/30 (36) kV



Standard cross-section of wire screen	16 · 25 · 30 · 35
Test voltage	3,5 x U _o
Conductor maximum operating temperature	90°C
Maximum short-circuit temperature	250°C (t ≤ 5s)
Minimum bending radius – during installation (mm)	25 x d
Minimum bending radius – after installation (mm)	18 x d
Maximum pulling force over conductor (N)	Copper – 50 x S Aluminium – 30 x S
Flame retardant	IEC 60332-1-2 · EN 60332-1-2 (cable vertically mounted, length of charred cable ≤ 540 mm)
Fire retardant (frt)	IEC 60332-3-23 · EN 60332-3-23 – Category B or IEC 60332-3-24 · EN 60332-3-24 – Category C (bunch of cables vertically mounted on a ladder, length of charred cable ≤ 2,5 m)
Halogen free (zh)	
Low smoke	IEC 61034-2 · EN 61034-2 (cable light transmittance ≥ 60%)
Low toxicity	IEC 60754-1 · EN 50267-2-1 (halogen acid gas content ≤ 0,5%)
Low corrosivity	IEC 60754-2 · EN 50267-2-3 (pH ≥4,3 · conductivity ≤ 10µS/mm)

S – conductor cross-section (mm²) · d – cable outer diameter (mm)

ELECTRICAL AND DIMENSIONAL CHARACTERISTICS

Copper conductor constructions for Fire Retardant Category B

Voltage		Conductor cross-section (mm²)	Diameter over insulation (mm)	Approx. outer diameter (mm)	Approx. weight (kg/km)	Current carrying capacity  (A)
U _o / U (kV)	U _m (kV)					
6/10	12	70	18,5	32,0	1 700	291
		95	20,0	33,5	2 010	355
		120	22,0	35,5	2 300	411
		150	23,0	36,5	2 590	466
		185	24,0	38,0	2 970	532
		240	27,0	41,0	3 590	634
		300	29,5	43,5	4 320	733
		400	32,5	47,0	5 240	853
		500	35,5	50,0	6 230	987
		630	39,0	53,5	7 710	1 136

MEDIUM VOLTAGE CABLE

Voltage		Conductor cross-section (mm ²)	Diameter over insulation (mm)	Approx. outer diameter (mm)	Approx. weight (kg/km)	Current carrying capacity  (A)
U _o / U (kV)	Um (kV)					
12/20	24	70	22,5	36,5	1 980	298
		95	24,5	38,0	2 290	362
		120	26,0	40,0	2 600	419
		150	27,0	41,0	2 890	474
		185	28,5	42,5	3 290	541
		240	31,0	45,0	3 920	643
		300	34,0	48,0	4 670	742
		400	36,5	51,0	5 610	862
		500	40,0	54,5	6 620	997
18/30	36	630	43,0	58,0	8 120	1 153
		70	27,5	41,5	2 330	303
		95	29,5	43,5	2 670	368
		120	31,0	45,0	2 980	425
		150	32,0	46,5	3 300	481
		185	33,5	47,5	3 700	547
		240	36,0	50,5	4 360	649
		300	39,0	53,5	5 140	748
		400	41,5	56,5	6 100	868
		500	45,0	60,0	7 130	1 003
		630	48,0	63,5	8 660	1 154

Aluminium conductor constructions for Fire Retardant Category B

Voltage		Conductor cross-section (mm ²)	Diameter over insulation (mm)	Approx. outer diameter (mm)	Approx. weight (kg/km)	Current carrying capacity  (A)
U _o / U (kV)	Um (kV)					
6/10	12	70	18,0	31,5	1 290	225
		95	20,0	33,5	1 450	274
		120	21,5	35,0	1 590	319
		150	23,0	36,5	1 730	361
		185	24,5	38,0	1 900	415
		240	26,5	40,5	2 150	493
		300	29,5	43,5	2 450	573
		400	32,5	46,5	2 830	671
		500	35,5	50,0	3 250	783
		630	40,0	54,5	3 880	926

Voltage		Conductor cross-section	Diameter over insulation	Approx. outer diameter	Approx. weight	Current carrying capacity 
U ₀ / U (kV)	Um (kV)	(mm ²)	(mm)	(mm)	(kg/km)	(A)
12/20	24	70	22,5	36,0	1 560	230
		95	24,0	38,0	1 720	280
		120	26,0	39,5	1 890	325
		150	27,0	41,0	2 030	368
		185	28,5	42,5	2 220	422
		240	31,0	45,0	2 470	499
		300	34,0	48,0	2 800	579
		400	36,5	51,0	3 200	677
		500	39,5	54,0	3 630	789
		630	44,0	59,0	4 300	930
18/30	36	70	27,5	41,5	1 920	234
		95	29,0	43,0	2 100	285
		120	31,0	45,0	2 270	330
		150	32,0	46,5	2 440	373
		185	33,5	48,0	2 620	427
		240	36,0	50,5	2 920	504
		300	39,0	53,5	3 260	584
		400	41,5	56,5	3 690	681
		500	44,5	59,5	4 150	792
		630	49,0	64,5	4 860	933

Other compositions are available, contact inform@cabelte.pt for information.

For cables with metallic screen of copper wires with cross-section of 16mm².

Current carrying capacity calculated considering the following conditions:

Maximum conductor temperature = 90°C

Cables in air, trefoil formation: Ambient temperature = 30°C

MEDIUM VOLTAGE CABLE

APPLICATION

Cable for power distribution and power supply stations used in Utility and Industrial applications, for rated voltages 6,35/11kV and 19/33kV. Suitable for fixed installations, indoor or outdoor, in open air on cable trays, or underground in ducts or directly buried.

CABLE DESIGNATION

Cu / XLPE / Cu Wire screen / PE: **XHIOE**

Al / XLPE / Cu Wire screen / PE: **LSXHIOE** or **LXHIOE**

Watertight constructions: **XHIOE(be)** or **XHIOE(cbe)**

Watertight constructions: **LSXHIOE(be)** or **LXHIOE(be)** or **LXHIOE(cbe)**

CONSTRUCTION CHARACTERISTICS

Conductor

Plain annealed Copper or Aluminium circular conductor. Copper conductors are stranded class 2, and Aluminium conductors are either solid class 1 (only for 11kV cables) or stranded class 2, per BS EN 60228.

Insulation

Semi-conductive screen over the conductor, XLPE (cross-linked polyethylene) insulation and semi-conductive screen over the insulation (strippable or bonded), applied by simultaneous extrusion in just one operation.

Metallic Screen

Annealed copper wires, helically wound and an equalising copper tape applied in an open counter-helix.

Oversheath

Extruded MDPE.

Upon agreement, an extruded semi-conductive thin layer may be applied on the surface of the oversheath, to facilitate the detection and location of defective points.

Watertightness

(be) – Metallic screen longitudinally watertight. Assured by application of a semi-conductive waterblocking tape under the screen and a non-conductive waterblocking tape over the screen.

(cbe) – Conductor and metallic screen longitudinally watertight. Conductor: assured by waterblocking yarns and /or tapes between wire layers; Metallic screen: assured by application of a semi-conductive waterblocking tape under the screen and a non-conductive waterblocking tape over the screen.

COLOUR AND CABLE MARKING

Red (for 11kV cables) or Black (for 33kV cables).

Oversheath marked at regular intervals with the following information:

ELECTRIC CABLE <voltage> BS7870-4.10 CABELTE 1 x <cond. cross-section> AL (if aluminium conductor)
<year of manufacture> <metric marking>

GENERAL CHARACTERISTICS

Construction and test standards	BS EN 60228 · BS 7870-4.10
Rated voltage U_0 / $U(U_m)$	6,35/11 (12) kV · 19/33 (36kV)
Standard cross-section of wire screen	16 · 25 · 35 · 50 · 70 · 95
Test voltage	4 x U_0



Conductor maximum operating temperature	90°C
Maximum short-circuit temperature	250°C (t ≤ 5s)
Minimum bending radius – during installation (mm)	20 x d (For cables with class 2 conductors) 25 x d (For cables with class 1 conductors)
Minimum bending radius – after installation (mm)	15 x d
Maximum pulling force over conductor (N)	30 x S

S – conductor cross-section (mm²) • d – cable outer diameter (mm)

DIMENSIONAL CHARACTERISTICS

Copper conductor constructions

Voltage		Conductor cross-section (mm ²)	Diameter over insulation (mm)	Approx. outer diameter (mm)	(1) Approx. weight (kg/km)
U ₀ /U (kV)	Um (kV)				
6,35/11	12	240	27,0	38,0	3 020
		300	30,0	40,5	3 690
		400	33,0	44,0	4 540
		500	36,0	47,5	5 480
		630	39,5	51,0	6 890
		800	43,5	56,0	8 730
19/33	36	120	31,5	42,0	2 320
		150	32,5	43,5	2 600
		185	33,5	44,5	2 970
		240	36,5	47,5	3 570
		300	39,0	50,5	4 280
		400	42,0	53,5	5 180
		500	45,0	57,0	6 170
		630	48,5	61,0	7 630
		800	53,0	65,5	9 540

Aluminium conductor constructions

Voltage		Conductor cross-section (mm ²)	Diameter over insulation (mm)	Approx. outer diameter (mm)	(1) Approx. weight (kg/km)
U ₀ /U (kV)	Um (kV)				
6,35/11	12	70	17,5 (solid) • 18,5 (stranded)	27,5 (solid) • 28,5 (stranded)	920
		95	19,0 (solid) • 20,0 (stranded)	29,5 (solid) • 30,5 (stranded)	1 020
		150	21,5 (solid) • 23,0 (stranded)	32,0 (solid) • 33,5 (stranded)	1 220
		185	23,5 (solid) • 24,5 (stranded)	34,0 (solid) • 35,0 (stranded)	1 380
		240	26,0 (solid) • 27,0 (stranded)	37,0 (solid) • 38,0 (stranded)	1 630
		300	28,0 (solid) • 30,0 (stranded)	38,5 (solid) • 40,5 (stranded)	1 800
19/33	36	120	31,0	41,5	1 600
		150	32,5	43,0	1 730
		185	34,0	45,0	1 890
		240	36,0	47,5	2 130
		300	39,0	50,5	2 410
		400	42,0	53,5	2 770
		500	45,0	57,0	3 190
		630	49,5	62,0	3 790
		800	52,0	64,5	4 430

Note – (1) Approximate weights for cables with a metallic screen of 35mm².

MEDIUM VOLTAGE CABLE

Unarmoured · XLPE Insulation · Aluminium Tape Screen · IEC 60502-2

APPLICATION

Cable for power distribution and power supply stations used in Utility and Industrial applications, for rated voltages up to 18/30kV. Suitable for fixed installations, indoor or outdoor, in open air on cable trays, or underground in ducts or directly buried.

CABLE DESIGNATION

Cu / XLPE / Al Tape Screen / PE: XHILE

Al / XLPE / Al Tape Screen / PE: LXHILE

CONSTRUCTION CHARACTERISTICS

Conductor

Plain annealed Copper or Aluminium, circular, stranded, class 2 per IEC 60228.

Insulation

Semi-conductive screen over the conductor, XLPE (cross-linked polyethylene) insulation and Semi-conductive screen over the insulation (strippable¹), applied by simultaneous extrusion in just one operation.

(1) Bonded upon agreement.

Metallic Screen

Aluminium copolymer coated tape, longitudinally applied, bonded to the oversheath. Cross-section area of tape in accordance with short circuit current.

A semi-conductive waterblocking tape is applied under the aluminium tape.

Oversheath

Extruded PE, type ST7.

COLOUR AND CABLE MARKING

Black (other upon agreement). Oversheath marked at regular intervals with the following information: CABELTE <cable designation> 1 x <cond. cross-section> <rated voltage> <order of manufacture> / <year of manufacture> <metric marking>

GENERAL CHARACTERISTICS

Construction and test standards	IEC 60228
	IEC 60502-2
Rated voltage U_0 / $U(U_m)$	3,6/6 (7,2) kV · 6/10 (12) kV · 8,7/15 (17,5) kV · 12/20 (24) kV · 18/30 (36) kV
Test voltage	3,5 x U_0
Conductor maximum operating temperature	90°C
Maximum short-circuit temperature	250°C ($t \leq 5s$)
Minimum bending radius – during installation (mm)	25 x d
Minimum bending radius – after installation (mm)	20 x d
Maximum pulling force over conductor (N)	Copper – 50 x S
	Aluminium – 30 x S

S – conductor cross-section (mm²)

d – cable outer diameter (mm)

Several compositions are available, contact inform@cabelte.pt for information.



We reserve the right to modify, at any time, without any obligation and without prior notice, the specifications and other technical data in this document, which must be confirmed when ordering.



MEDIUM VOLTAGE CABLE

APPLICATION

Cable for power distribution and power supply stations used in Utility and Industrial applications, for rated voltages up to 18/30kV. Suitable for fixed installations, indoor or outdoor, in open air on cable trays, or underground in ducts or directly buried. Cable is both longitudinally and radially watertight and therefore best suitable for wet conditions.

CABLE DESIGNATION

Cu / XLPE / Cu Wire screen / Al tape / PE: **XHIOLE(cbe)**

Al / XLPE / Cu Wire screen / Al tape / PE: **LXHIOLE(cbe)**

CONSTRUCTION CHARACTERISTICS

Conductor

Plain annealed Copper or Aluminium, circular, stranded, class 2 per IEC 60228.

Insulation

Semi-conductive screen over the conductor, XLPE (cross-linked polyethylene) insulation and Semi-conductive screen over the insulation (strippable¹), applied by simultaneous extrusion in just one operation.

(1) Bonded upon agreement.

Metallic Screen

Annealed copper wires, helically wound and an equalising copper tape applied in an open counter-helix. Cross-section area of screen according to client request.

Oversheath

Aluminium copolymer coated tape, longitudinally applied, bonded to the extruded PE oversheath, type ST7. Upon agreement, an extruded semi-conductive thin layer may be applied on the surface of the oversheath, to facilitate the detection and location of defective points.

Watertightness

(cbe) – Conductor and metallic screen longitudinally watertight. Conductor: assured by waterblocking yarns and/or tapes between wire layers; Metallic screen: assured by application of a waterblocking tape over metallic screen. A waterblocking yarn under the screen may be considered.

L – Radial watertightness provided by the aluminium-coated tape.

COLOUR AND CABLE MARKING

Black (other upon agreement). Oversheath marked at regular intervals with the following information: CABELTE <cable designation> 1 x <cond. cross-section>/<screen cross-section (if copper wires screen)> <rated voltage> <order of manufacture>/<year of manufacture> <metric marking>

GENERAL CHARACTERISTICS

Construction and test standards	IEC 60228
	IEC 60502-2
Rated voltage U_0 / $U(U_m)$	3,6/6 (7,2) kV • 6/10 (12) kV • 8,7/15 (17,5) kV • 12/20 (24) kV • 18/30 (36) kV
Standard cross-section of wire screen	16 • 25 • 30 • 35
Test voltage	3,5 x U_0
Conductor maximum operating temperature	90°C



Maximum short-circuit temperature	250°C (t ≤ 5s)
Minimum bending radius – during installation (mm)	25 x d
Minimum bending radius – after installation (mm)	20 x d
Maximum pulling force over conductor (N)	Copper – 50 x S Aluminium – 30 x S

S – conductor cross-section (mm²)
d – cable outer diameter (mm)

Several compositions are available, contact inform@cabelte.pt for information.

MEDIUM VOLTAGE CABLE

APPLICATION

Cable for power distribution and power supply stations used in Utility and Industrial applications, for rated voltages up to 18/30kV. Suitable for fixed installations, indoor or outdoor, in open air on cable trays, or underground in ducts or directly buried.

CABLE DESIGNATION

Cu / EPR / Cu Tape screen / PVC or PE: **BHIV · BHIE**

Cu / EPR / Cu Wire screen / PVC or PE: **BHIOV · BHIOE**

Al / EPR / Cu Tape screen / PVC or PE: **LBHIV · LBHIE**

Al / EPR / Cu Wire screen / PVC or PE: **LBHIOV · LBHIOE**

Watertight constructions: **BHIOE(be)** or **BHIOE(cbe)**

Watertight constructions: **LBHIOE(be)** or **LBHIOE(cbe)**

CONSTRUCTION CHARACTERISTICS

Conductor

Plain annealed Copper or Aluminium, circular, stranded, class 2 per IEC 60228.

Insulation

Semi-conductive screen over the conductor, HEPR (hard ethylene propylene rubber) insulation and Semi-conductive screen over the insulation (strippable¹), applied by simultaneous extrusion in just one operation.

(1) Bonded upon agreement.

Metallic Screen

Copper wire screen – annealed copper wires helically wound and an equalising copper tape applied in an open counter-helix.

Plastic tape is applied over the screen.

Or **Copper tape screen** – a copper tape, standard thickness 0,1 mm helically applied with overlap.

Oversheath

Extruded PVC, type ST2 or PE type ST7.

Upon agreement, an extruded semi-conductive thin layer may be applied on the surface of the oversheath, to facilitate the detection and location of defective points.

Watertightness option

(be) – Metallic screen longitudinally watertight. Assured by application of a waterblocking tape over metallic screen. A waterblocking yarn under the screen may be considered.

(cbe) – Conductor and metallic screen longitudinally watertight. Conductor: assured by a waterblocking yarns and or tapes between wires layers; Metallic screen: assured by application of a waterblocking tape over metallic screen. A waterblocking yarn under the screen may be considered.

COLOUR AND CABLE MARKING

Black (other upon agreement).

Oversheath marked at regular intervals with the following information:

CABELTE <cable designation> 1 x <cond. cross-section>/<screen cross-section (if copper wires screen)>

<rated voltage> <order of manufacture>/<year of manufacture> <metric marking>



GENERAL CHARACTERISTICS

Construction and test standards	IEC 60228 · IEC 60502-2
Rated voltage $U_0/U(Um)$	3,6/6 (7,2) kV · 6/10 (12) kV · 8,7/15 (17,5) kV · 12/20 (24) kV · 18/30 (36) kV
Standard cross-section of wire screen	16 · 25 · 30 · 35
Test voltage	3,5 x U_0
Conductor maximum operating temperature	105°C (90°C per IEC 60502-2)
Maximum short-circuit temperature	250°C ($t \leq 5s$)
Minimum bending radius – during installation (mm)	20 x d
Minimum bending radius – after installation (mm)	15 x d
Maximum pulling force over conductor (N)	Copper – 50 x S Aluminium – 30 x S
Flame retardant (for PVC oversheath)	IEC 60332-1-2 (cable vertically mounted, length of charred cable ≤ 540 mm).
Fire retardant (for PVC oversheath, upon agreement)	IEC 60332-3-24 (bunch of cables vertically mounted on a ladder, length of charred cable $\leq 2,5$ m)

S – conductor cross-section (mm²) · d – cable outer diameter (mm)

ELECTRICAL AND DIMENSIONAL CHARACTERISTICS

Copper conductor constructions

Voltage		Conductor cross-section	Diameter over insulation	Approx. outer diameter	Approx. weight BHI0V	Current carrying capacity 		Cond. max. short-circuit current, $t=1s$	Cond. DC resistance @ 20°C	Inductance 	Capacitance
U_0/U (kV)	U_m (kV)					In air (A)	Buried (A)				
3,6/6	7,2	25	13,0	20,0	689	153	159	3,6	0,727	0,41	0,343
		35	14,0	21,0	807	186	190	5,0	0,524	0,39	0,377
		50	15,0	22,5	945	224	225	7,5	0,387	0,37	0,411
		70	16,5	24,0	1 164	280	277	10,0	0,268	0,35	0,462
		95	18,5	26,0	1 453	343	334	13,6	0,193	0,33	0,529
		120	20,0	28,0	1 732	398	380	17,2	0,153	0,32	0,579
		150	21,0	29,0	1 989	454	425	21,5	0,124	0,31	0,613
		185	22,5	30,5	2 371	522	480	26,5	0,0991	0,30	0,663
		240	25,5	33,5	2 964	619	557	34,3	0,0754	0,29	0,731
		300	28,5	37,0	3 649	712	632	42,9	0,0601	0,28	0,762
		400	32,0	40,5	4 619	825	718	57,2	0,0470	0,28	0,803
		500	35,5	44,0	5 614	960	814	71,5	0,0366	0,27	0,838
		630	41,0	47,5	7 303	1 109	920	90,1	0,0283	0,27	0,982
6/10	12	25	15,0	22,0	778	153	159	3,6	0,727	0,43	0,276
		35	16,0	23,0	888	186	190	5,0	0,524	0,41	0,301
		50	17,0	24,5	1 042	224	225	7,5	0,387	0,39	0,326
		70	18,5	26,0	1 272	280	277	10,0	0,268	0,36	0,364
		95	20,5	28,0	1 573	343	334	13,6	0,193	0,35	0,414
		120	22,0	30,0	1 839	398	380	17,2	0,153	0,33	0,451

MEDIUM VOLTAGE CABLE

Voltage		Conductor cross-section (mm ²)	Diameter over insulation (mm)	Approx. outer diameter (mm)	Approx. weight BHIOV (kg/km)	Current carrying capacity 		Cond. max. short-circuit current, t=1s (kA)	Cond. DC resistance @ 20°C (Ω/km)	Inductance  (mH/km)	Capacitance (μF/km)
U _o / U (kV)	Um (kV)					In air (A)	Buried (A)				
6/10	12	150	23,0	31,0	2 122	454	425	21,5	0,124	0,32	0,476
		185	24,5	32,5	2 495	522	480	26,5	0,0991	0,32	0,513
		240	27,0	35,5	3 089	619	557	34,3	0,0754	0,30	0,574
		300	30,0	38,0	3 756	712	632	42,9	0,0601	0,29	0,648
		400	33,0	41,5	4 711	825	718	57,2	0,0470	0,28	0,722
		500	36,0	44,5	5 674	960	814	71,5	0,0366	0,27	0,796
		630	41,5	48,0	7 343	1 109	920	90,1	0,0283	0,27	0,931
8,7/15	17,5	25	17,0	24,5	885	153	159	3,6	0,727	0,45	0,221
		35	18,0	25,5	1 000	186	190	5,0	0,524	0,43	0,240
		50	19,0	26,5	1 150	224	225	7,5	0,387	0,41	0,260
		70	21,0	28,5	1 408	280	277	10,0	0,268	0,38	0,298
		95	22,5	30,5	1 690	343	334	13,6	0,193	0,36	0,326
		120	24,5	32,0	1 988	398	380	17,2	0,153	0,35	0,364
		150	25,5	33,5	2 258	454	425	21,5	0,124	0,34	0,383
		185	26,5	35,0	2 651	522	480	26,5	0,0991	0,33	0,402
		240	29,5	37,5	3 266	619	557	34,3	0,0754	0,32	0,458
		300	32,0	40,5	3 923	712	632	42,9	0,0601	0,30	0,505
		400	35,0	43,5	4 885	825	718	57,2	0,0470	0,29	0,561
		500	38,0	47,0	5 867	960	814	71,5	0,0366	0,28	0,617
		630	44,0	50,5	7 573	1 109	920	90,1	0,0283	0,28	0,728
12/20	24	35	20,0	27,5	1 115	186	190	5,0	0,524	0,44	0,209
		50	21,0	29,0	1 266	224	225	7,5	0,387	0,42	0,225
		70	23,0	31,0	1 535	280	277	10,0	0,268	0,40	0,256
		95	24,5	32,5	1 824	343	334	13,6	0,193	0,38	0,280
		120	26,5	34,5	2 135	398	380	17,2	0,153	0,36	0,311
		150	27,5	35,5	2 410	454	425	21,5	0,124	0,35	0,326
		185	28,5	37,0	2 804	522	480	26,5	0,0991	0,34	0,342
		240	31,5	39,5	3 417	619	557	34,3	0,0754	0,33	0,388
		300	34,0	42,5	4 102	712	632	42,9	0,0601	0,32	0,426
		400	37,0	45,5	5 082	825	718	57,2	0,0470	0,30	0,472
		500	40,0	49,0	6 077	960	814	71,5	0,0366	0,29	0,518
		630	46,0	52,5	7 815	1 109	920	90,1	0,0283	0,29	0,610
18/30	36	50	26,0	34,5	1 601	224	225	7,5	0,387	0,46	0,174
		70	28,0	36,0	1 871	280	277	10,0	0,268	0,43	0,197
		95	29,5	38,0	2 204	343	334	13,6	0,193	0,41	0,213
		120	31,5	39,5	2 509	398	380	17,2	0,153	0,39	0,235
		150	32,5	41,0	2 817	454	425	21,5	0,124	0,38	0,246
		185	33,5	42,0	3 209	522	480	26,5	0,0991	0,37	0,257
		240	36,5	45,0	3 874	619	557	34,3	0,0754	0,35	0,289
		300	39,0	48,0	4 591	712	632	42,9	0,0601	0,34	0,316
		400	42,0	51,0	5 609	825	718	57,2	0,0470	0,33	0,348
		500	45,0	54,5	6 641	960	814	71,5	0,0366	0,32	0,379
		630	51,0	58,0	8 439	1 109	920	90,1	0,0283	0,31	0,443

Aluminium conductor constructions

Voltage		Conductor cross-section (mm ²)	Diameter over insulation (mm)	Approx. outer diameter (mm)	Approx. weight LBHIOV (kg/km)	Current carrying capacity 		Cond. max. short-circuit current, t=1s (kA)	Cond. DC resistance @ 20°C (Ω/km)	Inductance  (mH/km)	Capacitance (μF/km)
U _o / U (kV)	Um (kV)					In air (A)	Buried (A)				
3,6/6	7,2	25	12,5	20,0	536	119	123	2,4	1,20	0,41	0,326
		35	13,5	21,0	594	144	148	3,3	0,868	0,39	0,360
		50	15,0	22,0	656	174	175	4,7	0,641	0,37	0,411
		70	16,5	24,0	750	218	215	6,6	0,443	0,35	0,462
		95	18,0	25,5	879	266	259	9,0	0,320	0,33	0,512
		120	20,0	27,5	1 008	309	294	11,3	0,253	0,32	0,579
		150	21,0	29,0	1 114	352	330	14,2	0,206	0,31	0,613
		185	22,5	30,5	1 269	406	374	17,5	0,164	0,30	0,663
		240	25,5	33,5	1 506	483	434	22,7	0,125	0,29	0,731
		300	28,5	37,0	1 788	556	494	28,3	0,100	0,28	0,762
		400	32,0	40,0	2 170	651	566	37,8	0,0778	0,28	0,803
6/10	12	500	35,0	43,5	2 579	763	648	47,2	0,0605	0,27	0,825
		630	40,0	49,0	3 194	906	745	59,5	0,0469	0,26	0,956
		25	14,5	22,0	620	119	123	2,4	1,20	0,43	0,263
		35	15,5	23,0	679	144	148	3,3	0,868	0,41	0,289
		50	17,0	24,5	757	174	175	4,7	0,641	0,39	0,326
		70	18,5	26,0	858	218	215	6,6	0,443	0,37	0,364
		95	20,0	28,0	994	266	259	9,0	0,320	0,35	0,401
		120	22,0	29,5	1 120	309	294	11,3	0,253	0,33	0,451
		150	23,0	31,0	1 247	352	330	14,2	0,206	0,32	0,476
		185	24,5	32,5	1 393	406	374	17,5	0,164	0,31	0,513
		240	27,0	35,0	1 626	483	434	22,7	0,125	0,30	0,574
8,7/15	17,5	300	30,0	38,0	1 901	556	494	28,3	0,100	0,29	0,648
		400	32,5	41,0	2 248	651	566	37,8	0,0778	0,28	0,710
		500	35,5	44,5	2 638	763	648	47,2	0,0605	0,28	0,784
		630	40,5	49,0	3 235	906	745	59,5	0,0469	0,27	0,907
		25	17,0	24,5	730	119	123	2,4	1,20	0,45	0,221
		35	18,0	25,5	791	144	148	3,3	0,868	0,43	0,240
		50	19,0	26,5	861	174	175	4,7	0,641	0,41	0,260
		70	20,5	28,5	983	218	215	6,6	0,443	0,38	0,288
		95	22,5	30,0	1 116	266	259	9,0	0,320	0,36	0,326
		120	24,0	32,0	1 263	309	294	11,3	0,253	0,35	0,355
		150	25,5	33,5	1 383	352	330	14,2	0,206	0,34	0,383
		185	27,0	35,0	1 556	406	374	17,5	0,164	0,33	0,411
		240	29,0	37,5	1 795	483	434	22,7	0,125	0,32	0,449
		300	32,0	40,5	2 063	556	494	28,3	0,100	0,30	0,505
		400	35,0	43,5	2 437	651	566	37,8	0,0778	0,29	0,561
		500	38,0	46,5	2 840	763	648	47,2	0,0605	0,29	0,617
		630	42,5	51,5	3 447	906	745	59,5	0,0469	0,27	0,700

MEDIUM VOLTAGE CABLE

Voltage		Conductor cross-section (mm ²)	Diameter over insulation (mm)	Approx. outer diameter (mm)	Approx. weight LBHIOV (kg/km)	Current carrying capacity 		Cond. max. short-circuit current, t=1s (kA)	Cond. DC resistance @ 20°C (Ω/km)	Inductance  (mH/km)	Capacitance (μF/km)
U _o / U (kV)	Um (kV)					In air (A)	Buried (A)				
12/20	24	35	20,0	27,5	905	144	148	3,3	0,868	0,44	0,209
		50	21,0	28,5	976	174	175	4,7	0,641	0,42	0,225
		70	22,5	30,5	1 110	218	215	6,6	0,443	0,40	0,248
		95	24,5	32,5	1 250	266	259	9,0	0,320	0,38	0,280
		120	26,0	34,0	1 404	309	294	11,3	0,253	0,36	0,303
		150	27,5	35,5	1 535	352	330	14,2	0,206	0,35	0,326
		185	29,0	37,0	1 715	406	374	17,5	0,164	0,34	0,349
		240	31,0	39,5	1 946	483	434	22,7	0,125	0,33	0,380
		300	34,0	42,5	2 246	556	494	28,3	0,100	0,32	0,426
		400	37,0	45,5	2 629	651	566	37,8	0,0778	0,30	0,472
		500	40,0	48,5	3 050	763	648	47,2	0,0605	0,30	0,518
		630	44,5	53,5	3 677	906	745	59,5	0,0469	0,28	0,587
18/30	36	50	26,0	34,0	1 312	174	175	4,7	0,641	0,46	0,174
		70	27,5	36,0	1 445	218	215	6,6	0,443	0,43	0,191
		95	29,5	37,5	1 625	266	259	9,0	0,320	0,41	0,213
		120	31,0	39,5	1 777	309	294	11,3	0,253	0,39	0,230
		150	32,5	41,0	1 942	352	330	14,2	0,206	0,38	0,246
		185	34,0	42,5	2 121	406	374	17,5	0,164	0,37	0,262
		240	36,0	45,0	2 397	483	434	22,7	0,125	0,36	0,284
		300	39,0	48,0	2 735	556	494	28,3	0,100	0,34	0,316
		400	42,0	51,0	3 155	651	566	37,8	0,0778	0,33	0,348
		500	45,0	54,0	3 609	763	648	47,2	0,0605	0,32	0,379
		630	49,5	59,0	4 293	906	745	59,5	0,0469	0,30	0,427

Current carrying capacity calculated considering the following conditions:

Maximum conductor temperature = 90°C

Cables in air: Ambient temperature = 30°C

Cables directly buried: Ground temperature = 20°C • Depth of laying = 0,7m • Thermal resistivity of soil = 1,0 K.m/W

MEDIUM VOLTAGE CABLE

APPLICATION

Cable for power distribution and power supply stations used in Utility and Industrial applications, for rated voltages up to 18/30kV. Suitable for fixed installations, directly buried. Good mechanical protection.

CABLE DESIGNATION

Cu / XLPE / Cu Tape screen / Aluminium Tape armour / PVC or PE: **XHI1AV · XHI1AE**

Cu / XLPE / Cu Wire screen / Aluminium Tape armour / PVC or PE: **XHIO1AV · XHIO1AE**

Al / XLPE / Cu Tape screen / Aluminium Tape armour / PVC or PE: **LXHI1AV · LXHI1AE**

Al / XLPE / Cu Wire screen / Aluminium Tape armour / PVC or PE: **LXHIO1AV · LXHIO1AE**

Cu / XLPE / Cu Tape screen / Aluminium Wire armour / PVC or PE: **XHI1RV · XHI1RE**

Cu / XLPE / Cu Wire screen / Aluminium Wire armour / PVC or PE: **XHIO1RV · XHIO1RE**

Al / XLPE / Cu Tape screen / Aluminium Wire armour / PVC or PE: **LXHI1RV · LXHI1RE**

Al / XLPE / Cu Wire screen / Aluminium Wire armour / PVC or PE: **LXHIO1RV · LXHIO1RE**

Watertight constructions **XHIO1AE(be)** or **LXHIO1AE(cbe)**

Watertight constructions **XHIO1RE(be)** or **LXHIO1RE(cbe)**

CONSTRUCTION CHARACTERISTICS

Conductor

Plain annealed Copper or Aluminium, circular, stranded, class 2 per IEC 60228.

Insulation

Semi-conductive screen over the conductor, XLPE (cross-linked polyethylene) insulation and Semi-conductive screen over the insulation (strippable¹), applied by simultaneous extrusion in just one operation.

(1) Bonded upon agreement.

Metallic Screen

Copper wire screen – annealed copper wires helically wound and an equalising copper tape applied in an open counter-helix. Cross-section area of screen according to client request.

A wrapping plastic tape is applied over the screen.

Or **Copper tape screen** – a copper tape, standard thickness 0,1 mm helically applied with overlap.

Inner Sheath

Extruded PVC.

Armour

Two aluminium tapes helically applied.

Or Aluminium wires, helically applied, tightened with plastic tapes.

Oversheath

Extruded PVC, type ST2 or PE type ST7.

Watertightness option under inner sheath

(be) – Metallic screen longitudinally watertight. Assured by application of a waterblocking tape over the metallic screen. A waterblocking yarn under the screen may be considered.

(cbe) – Conductor and metallic screen longitudinally watertight. Conductor: assured by waterblocking yarns and/or tapes between wire layers; Metallic screen: assured by application of a waterblocking tape over metallic screen. A waterblocking yarn under the screen may be considered.



COLOUR AND CABLE MARKING

Black (other upon agreement).

Oversheath marked at regular intervals with the following information:

CABELTE <cable designation> 1 x <cond. cross-section>/<screen cross-section (if copper wires screen)> <rated voltage>
<order of manufacture>/<year of manufacture> <metric marking>

GENERAL CHARACTERISTICS

Construction and test standards	IEC 60228 · IEC 60502-2
Rated voltage $U_0/U(Um)$	3,6/6 (7,2) kV · 6/10 (12) kV · 8,7/15 (17,5) kV · 12/20 (24) kV · 18/30 (36) kV
Standard cross-section of wire screen	16 · 25 · 30 · 35
Test voltage	3,5 x U_0
Conductor maximum operating temperature	90°C
Maximum short-circuit temperature	250°C ($t \leq 5s$)
Minimum bending radius – during installation (mm)	20 x d
Minimum bending radius – after installation (mm)	15 x d
Maximum pulling force over conductor (N)	Copper – 50 x S · Aluminium – 30 x S
Flame retardant (for PVC oversheath)	IEC 60332-1-2 · EN 60332-1-2 (cable vertically mounted, length of charred cable ≤ 540 mm)
Fire retardant (for PVC oversheath, upon agreement)	IEC 60332-3-24 · EN 60332-3-24 (bunch of cables vertically mounted on a ladder, length of charred cable $\leq 2,5$ m)

S – conductor cross-section (mm^2) · d – cable outer diameter (mm)

ELECTRICAL AND DIMENSIONAL CHARACTERISTICS

Copper conductor constructions

Voltage		Conductor cross-section	Diameter over insulation	Approx. outer diameter	Approx. weight XH101AV	Current carrying capacity 		Cond. max. short-circuit current, t=1s	Cond. DC resistance @ 20°C	Inductance 	Capacitance
U ₀ / U (kV)	Um (kV)					In air (A)	Buried (A)				
Copper conductor											
3,6/6	7,2	25	13,0	25,5	960	164	164	3,6	0,7270	0,44	0,27
		35	14,0	26,5	1 080	198	196	5,0	0,5240	0,42	0,30
		50	15,0	27,5	1 230	238	231	7,2	0,3870	0,40	0,33
		70	16,5	29,5	1 470	296	282	10,0	0,2680	0,38	0,38
		95	18,5	31,0	1 760	360	338	13,6	0,1930	0,36	0,43
		120	20,0	32,5	2 035	417	384	17,2	0,1530	0,34	0,48
		150	21,0	34,0	2 325	470	428	21,5	0,1240	0,33	0,51
		185	22,5	35,5	2 700	535	481	26,5	0,0991	0,33	0,54
		240	25,5	38,5	3 340	635	557	34,3	0,0754	0,31	0,60
		300	28,5	42,0	4 050	729	625	42,9	0,0601	0,31	0,63
		400	32,0	45,5	5 045	844	708	57,2	0,0470	0,30	0,66
		500	35,5	49,0	6 070	971	797	71,5	0,0366	0,29	0,69
630	41,0	53,0	7 775	1 109	892	90,1	0,0283	0,28	0,76		

MEDIUM VOLTAGE CABLE

Armoured · XLPE Insulation · IEC 60502-2

Voltage		Conductor cross- -section	Diameter over insulation	Approx. outer diameter	Approx. weight XHIO1AV	Current carrying capacity 		Cond. max. short-circuit current, t=1s	Cond. DC resistance @ 20°C	Inductance 	Capacitance
U _o / U (kV)	Um (kV)					In air (A)	Buried (A)				
Copper conductor											
6/10	12	25	15,0	27,5	1 050	166	163	3,6	0,7270	0,46	0,22
		35	16,0	28,5	1 175	201	196	5,0	0,5240	0,44	0,24
		50	17,0	29,5	1 325	240	231	7,2	0,3870	0,41	0,27
		70	18,5	31,5	1 575	299	282	10,0	0,2680	0,39	0,30
		95	20,5	33,0	1 865	364	338	13,6	0,1930	0,37	0,34
		120	22,0	35,0	2 170	420	383	17,2	0,1530	0,36	0,37
		150	23,0	36,0	2 445	474	428	21,5	0,1240	0,35	0,39
		185	24,5	37,5	2 845	539	471	26,5	0,0991	0,34	0,42
		240	27,0	40,0	3 445	636	555	34,3	0,0754	0,32	0,48
		300	30,0	43,0	4 130	731	625	42,9	0,0601	0,31	0,53
		400	33,0	46,0	5 105	846	708	57,2	0,0470	0,30	0,59
		500	36,0	49,5	6 100	972	797	71,5	0,0366	0,29	0,65
		630	41,5	53,0	7 815	1 110	892	90,1	0,0283	0,28	0,72
8,7/15	17,5	25	17,0	29,5	1 155	168	163	3,6	0,7270	0,48	0,18
		35	18,0	30,5	1 285	203	195	5,0	0,5240	0,45	0,20
		50	19,0	32,0	1 440	243	231	7,2	0,3870	0,43	0,21
		70	21,0	33,5	1 690	302	282	10,0	0,2680	0,41	0,24
		95	22,5	35,5	2 010	366	337	13,6	0,1930	0,39	0,27
		120	24,5	37,0	2 300	423	383	17,2	0,1530	0,37	0,29
		150	25,5	38,5	2 600	477	428	21,5	0,1240	0,36	0,31
		185	26,5	39,5	2 985	541	480	26,5	0,0991	0,35	0,33
		240	29,5	42,5	3 615	640	555	34,3	0,0754	0,34	0,38
		300	32,0	45,5	4 315	736	626	42,9	0,0601	0,32	0,42
		400	35,0	48,5	5 300	850	709	57,2	0,0470	0,31	0,46
		500	38,0	52,0	6 335	976	798	71,5	0,0366	0,30	0,51
		630	44,0	55,5	8 045	1 115	894	90,1	0,0283	0,29	0,56
12/20	24	35	20,0	32,5	1 390	204	195	5,0	0,5240	0,47	0,17
		50	21,0	34,0	1 565	244	231	7,2	0,3870	0,44	0,19
		70	23,0	35,5	1 825	304	282	10,0	0,2680	0,42	0,21
		95	24,5	37,5	2 150	368	337	13,6	0,1930	0,40	0,23
		120	26,5	39,5	2 445	425	383	17,2	0,1530	0,38	0,25
		150	27,5	40,5	2 750	479	427	21,5	0,1240	0,37	0,27
		185	28,5	42,0	3 140	544	479	26,5	0,0991	0,36	0,28
		240	31,5	45,0	3 780	643	555	34,3	0,0754	0,35	0,32
		300	34,0	47,5	4 490	739	626	42,9	0,0601	0,33	0,35
		400	37,0	51,0	5 515	853	709	57,2	0,0470	0,32	0,39
		500	40,0	54,5	6 535	979	799	71,5	0,0366	0,31	0,43
		630	46,0	58,0	8 300	1 119	896	90,1	0,0283	0,30	0,47

Voltage		Conductor cross-section	Diameter over insulation	Approx. outer diameter	Approx. weight XHIO1AV	Current carrying capacity 		Cond. max. short-circuit current, t=1s	Cond. DC resistance @ 20°C	Inductance 	Capacitance
U _o / U (kV)	Um (kV)					In air (A)	Buried (A)				
Copper conductor											
18/30	36	50	26,0	39,0	1 890	248	230	7,2	0,3870	0,48	0,14
		70	28,0	41,0	2 180	307	281	10,0	0,2680	0,45	0,16
		95	29,5	43,0	2 500	372	335	13,6	0,1930	0,43	0,18
		120	31,5	44,5	2 835	429	382	17,2	0,1530	0,41	0,19
		150	32,5	46,0	3 125	484	426	21,5	0,1240	0,40	0,20
		185	33,5	47,5	3 550	549	479	26,5	0,0991	0,39	0,21
		240	36,5	50,5	4 245	648	555	34,3	0,0754	0,37	0,24
		300	39,0	53,5	4 985	744	627	42,9	0,0601	0,36	0,26
		400	42,0	56,5	6 040	858	710	57,2	0,0470	0,34	0,29
		500	45,0	59,5	7 060	985	801	71,5	0,0366	0,33	0,31
630	51,0	63,5	8 875	1 126	900	90,1	0,0283	0,32	0,34		

Aluminium conductor constructions

Voltage		Conductor cross-section	Diameter over insulation	Approx. outer diameter	Approx. weight LXHIO1AV	Current carrying capacity 		Cond. max. short-circuit current, t=1s	Cond. DC resistance @ 20°C	Inductance 	Capacitance
U _o / U (kV)	Um (kV)					In air (A)	Buried (A)				
Aluminium conductor											
3,6/6	7,2	25	12,5	25,5	810	127	127	2,4	1,2000	0,44	0,27
		35	13,5	26,5	870	153	151	3,3	0,8680	0,42	0,30
		50	15,0	27,5	940	183	179	4,7	0,6410	0,40	0,33
		70	16,5	29,0	1 050	229	219	6,6	0,4430	0,38	0,38
		95	18,0	31,0	1 180	279	262	9,0	0,3200	0,36	0,42
		120	20,0	32,5	1 315	324	299	11,3	0,2530	0,34	0,47
		150	21,0	34,0	1 450	366	334	14,2	0,2060	0,33	0,51
		185	22,5	35,5	1 605	420	377	17,5	0,1640	0,32	0,55
		240	25,5	38,5	1 875	497	437	22,7	0,1250	0,32	0,60
		300	28,5	42,0	2 190	575	493	28,3	0,1000	0,31	0,63
		400	32,0	45,5	2 595	671	563	37,8	0,0778	0,30	0,66
		500	35,0	49,0	3 035	779	641	47,2	0,0605	0,29	0,69
630	40,0	54,0	3 690	915	732	59,5	0,0469	0,28	0,79		
6/10	12	25	14,5	27,5	900	129	127	2,4	1,2000	0,46	0,22
		35	15,5	28,5	965	155	151	3,3	0,8680	0,44	0,24
		50	17,0	29,5	1 035	185	179	4,7	0,6410	0,42	0,26
		70	18,5	31,0	1 155	232	219	6,6	0,4430	0,39	0,30
		95	20,0	33,0	1 290	282	262	9,0	0,3200	0,37	0,33
		120	22,0	34,5	1 445	326	298	11,3	0,2530	0,36	0,37
		150	23,0	36,0	1 565	369	333	14,2	0,2060	0,35	0,39
		185	24,5	37,5	1 745	423	377	17,5	0,1640	0,34	0,43
		240	27,0	40,0	1 980	498	436	22,7	0,1250	0,32	0,47
		300	30,0	43,0	2 275	576	493	28,3	0,1000	0,31	0,53

MEDIUM VOLTAGE CABLE

Voltage		Conductor cross-section	Diameter over insulation	Approx. outer diameter	Approx. weight LXHI01AV	Current carrying capacity 		Cond. max. short-circuit current, t=1s	Cond. DC resistance @ 20°C	Inductance 	Capacitance
U _o / U (kV)	Um (kV)					In air (A)	Buried (A)				
Aluminium conductor											
6/10	12	400	32,5	46,0	2 655	672	564	37,8	0,0778	0,30	0,59
		500	35,5	49,0	3 065	779	641	47,2	0,0605	0,29	0,65
		630	40,5	54,5	3 725	915	732	59,5	0,0469	0,28	0,75
8,7/15	17,5	25	17,0	29,5	1 005	130	127	2,4	1,2000	0,48	0,18
		35	18,0	30,5	1 075	157	151	3,3	0,8680	0,46	0,19
		50	19,0	31,5	1 150	187	179	4,7	0,6410	0,43	0,21
		70	20,5	33,5	1 270	234	219	6,6	0,4430	0,41	0,24
		95	22,5	35,0	1 430	284	261	9,0	0,3200	0,39	0,27
		120	24,0	37,0	1 575	329	298	11,3	0,2530	0,37	0,29
		150	25,5	38,5	1 720	372	333	14,2	0,2060	0,36	0,31
		185	27,0	40,0	1 885	425	376	17,5	0,1640	0,35	0,34
		240	29,0	42,5	2 150	501	435	22,7	0,1250	0,34	0,37
		300	32,0	45,5	2 455	579	493	28,3	0,1000	0,32	0,42
		400	35,0	48,5	2 850	674	563	37,8	0,0778	0,31	0,46
		500	38,0	52,0	3 300	790	641	47,2	0,0605	0,30	0,51
		630	42,5	56,5	3 950	917	732	59,5	0,0469	0,29	0,58
12/20	24	35	20,0	32,5	1 180	158	151	3,3	0,8680	0,47	0,17
		50	21,0	34,0	1 275	189	178	4,7	0,6410	0,45	0,18
		70	22,5	35,5	1 405	235	219	6,6	0,4430	0,42	0,21
		95	24,5	37,5	1 570	286	261	9,0	0,3200	0,40	0,23
		120	26,0	39,0	1 720	330	297	11,3	0,2530	0,38	0,25
		150	27,5	40,5	1 875	373	333	14,2	0,2060	0,37	0,27
		185	29,0	42,0	2 045	426	376	17,5	0,1640	0,36	0,29
		240	31,0	44,5	2 315	503	435	22,7	0,1250	0,35	0,32
		300	34,0	47,5	2 635	581	493	28,3	0,1000	0,33	0,35
		400	37,0	51,0	3 060	676	563	37,8	0,0778	0,32	0,39
		500	40,0	54,0	3 500	783	641	47,2	0,0605	0,31	0,43
		630	44,5	59,0	4 200	918	732	59,5	0,0469	0,30	0,49
18/30	36	50	26,0	39,0	1.595	191	178	4,7	0,641	0,48	0,14
		70	27,5	41,0	1.760	238	218	6,6	0,443	0,45	0,16
		95	29,5	42,5	1.920	288	260	9,0	0,320	0,43	0,17
		120	31,0	44,5	2.105	333	297	11,3	0,253	0,41	0,19
		150	32,5	46,0	2.250	376	332	14,2	0,206	0,40	0,20
		185	34,0	47,5	2.460	430	375	17,5	0,164	0,39	0,21
		240	36,0	50,0	2.780	506	435	22,7	0,125	0,37	0,24
		300	39,0	53,5	3.125	584	493	28,3	0,100	0,36	0,26
		400	42,0	56,5	3.585	679	563	37,8	0,0778	0,34	0,29
		500	45,0	59,5	4.020	786	642	47,2	0,0605	0,33	0,31
		630	49,5	64,5	4.765	920	734	59,5	0,0469	0,32	0,35

Current carrying capacity calculated considering the following conditions:

Maximum conductor temperature = 90°C

Cables in air: Ambient temperature = 30°C

Cables directly buried: Ground temperature = 20°C · Depth of laying = 0,7m · Thermal resistivity of soil = 1,0K.m/W

MEDIUM VOLTAGE CABLE

APPLICATION

Cable for power distribution and power supply stations used in Utility and Industrial applications, for rated voltages up to 18/30kV. Suitable for fixed installations, indoor or outdoor, in open air on cable trays, or underground in ducts or directly buried.

CABLE DESIGNATION

Cu / XLPE / Cu Tape screen / PVC or PE: **XHIV · XHIE**

Cu / XLPE / Cu Wire screen / PVC or PE: **XHIOV · XHIOE**

Al / XLPE / Cu Tape screen / PVC or PE: **LXHIV · LXHIE**

Al / XLPE / Cu Wire screen / PVC or PE: **LXHIOV · LXHIOE**

CONSTRUCTION CHARACTERISTICS

Conductor

Plain annealed Copper or Aluminium, circular, stranded, class 2 per IEC 60228.

Insulation

Semi-conductive screen over the conductor, XLPE (cross-linked polyethylene) insulation and Semi-conductive screen over the insulation (strippable¹), applied by simultaneous extrusion in just one operation.

(1) Bonded upon agreement.

Metallic Screen over each conductor

Copper wire screen – annealed copper wires helically wound and an equalising copper tape applied in an open counter-helix.

Or **Copper tape screen** – a copper tape, standard thickness 0,1 mm helically applied with overlap.

Screened conductors are stranded together with fillers. A plastic tape is applied over this core.

Fillers

Extruded polymeric material.

Oversheath

Extruded PVC, type ST2 or PE type ST7.

Optionally, a Low Smoke Halogen Free thermoplastic compound can be used for cables with need for improved fire behaviour.

COLOUR AND CABLE MARKING

Black (other upon agreement). Oversheath marked at regular intervals with the following information:

CABELTE < cable designation > 3 x < cond. cross-section > / < screen cross-section (if copper wires screen) > < rated voltage > < order of manufacture > / < year of manufacture > < metric marking >

GENERAL CHARACTERISTICS

Construction and test standards	IEC 60228
	IEC 60502-2
Rated voltage U_0 / $U(\text{Um})$	3,6/6 (7,2) kV · 6/10 (12) kV · 8,7/15 (17,5) kV · 12/20 (24) kV · 18/30 (36) kV
Standard cross-section of wire screen	16 · 25 · 30 · 35
Test voltage	3,5 x U_0



Conductor maximum operating temperature	90°C
Maximum short-circuit temperature	250°C (t ≤ 5s)
Minimum bending radius – during installation (mm)	20 x d
Minimum bending radius – after installation (mm)	15 x d
Maximum pulling force over conductor (N)	Copper – 50 x S Aluminium – 30 x S
Flame retardant (for PVC oversheath)	IEC 60332-1-2 · EN 60332-1-2 (cable vertically mounted, length of charred cable ≤ 540 mm).
Fire retardant (for PVC oversheath, upon agreement)	IEC 60332-3-24 · EN 60332-3-24 (bunch of cables vertically mounted on a ladder, length of charred cable ≤ 2,5 m)

 S – conductor cross-section (mm²)

d – cable outer diameter (mm)

ELECTRICAL AND DIMENSIONAL CHARACTERISTICS

Copper conductor constructions

Voltage		Conductor cross-section	Diameter over insulation	Approx. outer diameter	Approx. weight XH10V	Current carrying capacity 		Cond. max. short-circuit current, t=1s	Cond. DC resistance @ 20°C	Inductance 	Capacitance
U _o / U	Um					In air	Buried				
(kV)	(kV)	(mm ²)	(mm)	(mm)	(kg/km)	(A)	(A)	(kA)	(Ω/km)	(mH/km)	(μF/km)
Copper conductor											
3,6/6	7,2	25	13,0	39,5	2 395	142	148	3,6	0,7270	0,38	0,27
		35	14,0	42,0	2 770	170	175	5,0	0,5240	0,36	0,30
		50	15,0	44,5	3 270	204	209	7,5	0,3870	0,34	0,33
		70	16,5	48,5	4 085	253	256	10,0	0,2680	0,32	0,38
		95	18,5	52,5	5 005	304	303	13,6	0,1930	0,30	0,43
		120	20,0	56,5	5 910	351	345	17,2	0,1530	0,29	0,48
		150	21,0	59,0	6 825	398	390	21,5	0,1240	0,28	0,51
		185	22,5	62,0	8 055	455	440	26,5	0,0991	0,28	0,54
		240	25,5	69,0	10 180	531	507	34,3	0,0754	0,27	0,60
		300	28,5	76,0	12 490	606	571	42,9	0,0601	0,26	0,63
		400	32,0	84,0	15 820	696	645	57,2	0,0470	0,26	0,66
6/10	12	25	15,0	44,0	2 715	142	148	3,6	0,7270	0,40	0,22
		35	16,0	46,5	3 115	170	175	5,0	0,5240	0,38	0,24
		50	17,0	49,0	3 640	204	209	7,5	0,3870	0,37	0,27
		70	18,5	53,0	4 480	253	256	10,0	0,2680	0,34	0,30
		95	20,5	57,0	5 460	304	303	13,6	0,1930	0,32	0,34
		120	22,0	61,0	6 395	351	345	17,2	0,1530	0,31	0,37
		150	23,0	63,5	7 335	398	390	21,5	0,1240	0,30	0,39
		185	24,5	66,5	8 590	455	440	26,5	0,0991	0,29	0,42
		240	27,0	72,5	10 605	531	507	34,3	0,0754	0,28	0,48
		300	30,0	79,0	12 880	606	571	42,9	0,0601	0,27	0,53
		400	33,0	85,5	16 050	696	645	57,2	0,0470	0,26	0,59

MEDIUM VOLTAGE CABLE

Voltage		Conductor cross-section	Diameter over insulation	Approx. outer diameter	Approx. weight XH10V	Current carrying capacity		Cond. max. short-circuit current, t=1s	Cond. DC resistance @ 20°C	Inductance	Capacitance
U ₀ / U	Um					In air	Buried				
(kV)	(kV)	(mm ²)	(mm)	(mm)	(kg/km)	(A)	(A)	(kA)	(Ω/km)	(mH/km)	(μF/km)
Copper conductor											
8,7/15	17,5	25	17,0	49,0	3 125	142	148	3,6	0,7270	0,43	0,18
		35	18,0	51,5	3 540	170	175	5,0	0,5240	0,41	0,20
		50	19,0	54,5	4 135	204	209	7,5	0,3870	0,39	0,21
		70	21,0	58,0	4 965	253	256	10,0	0,2680	0,36	0,24
		95	22,5	62,0	5 950	304	303	13,6	0,1930	0,34	0,27
		120	24,5	66,0	6 915	351	345	17,2	0,1530	0,33	0,29
		150	25,5	68,5	7 940	398	390	21,5	0,1240	0,32	0,31
		185	26,5	71,5	9 160	455	440	26,5	0,0991	0,31	0,33
		240	29,5	78,0	11 265	531	507	34,3	0,0754	0,30	0,38
		300	32,0	84,0	13 595	606	571	42,9	0,0601	0,29	0,42
12/20	24	400	35,0	90,5	16 825	696	645	57,2	0,0470	0,27	0,46
		35	20,0	56,0	3 950	170	175	5,0	0,5240	0,43	0,17
		50	21,0	59,0	4 525	204	209	7,5	0,3870	0,41	0,19
		70	23,0	63,0	5 470	253	256	10,0	0,2680	0,37	0,21
		95	24,5	67,0	6 485	304	303	13,6	0,1930	0,36	0,23
		120	26,5	70,5	7 480	351	345	17,2	0,1530	0,34	0,25
		150	27,5	73,5	8 465	398	390	21,5	0,1240	0,33	0,27
		185	28,5	76,5	9 775	455	440	26,5	0,0991	0,32	0,28
		240	31,5	82,5	11 930	531	507	34,3	0,0754	0,31	0,32
18/30	36	300	34,0	88,5	14 270	606	571	42,9	0,0601	0,30	0,35
		400	37,0	95,5	17 600	696	645	57,2	0,0470	0,29	0,39
		50	26,0	70,5	5 800	204	209	7,5	0,3870	0,45	0,14
		70	28,0	74,5	6 795	253	256	10,0	0,2680	0,41	0,16
		95	29,5	78,5	7 985	304	303	13,6	0,1930	0,39	0,18
		120	31,5	82,5	9 060	351	345	17,2	0,1530	0,38	0,19
		150	32,5	85,0	10 030	398	390	21,5	0,1240	0,36	0,20
		185	33,5	88,0	11 475	455	440	26,5	0,0991	0,35	0,21
		240	36,5	94,0	13 630	531	507	34,3	0,0754	0,34	0,24
		300	39,0	100,0	16 145	606	571	42,9	0,0601	0,32	0,26
		400	42,0	107,0	19 650	696	645	57,2	0,0470	0,31	0,29

Current carrying capacity calculated considering the following conditions:

Maximum conductor temperature = 90°C

Cables in air: Ambient temperature = 30°C

Cables directly buried: Ground temperature = 20°C · Depth of laying = 0,7m · Thermal resistivity of soil = 1,0K.m/W

ELECTRICAL AND DIMENSIONAL CHARACTERISTICS

Aluminium conductor constructions

Voltage		Conductor cross-section	Diameter over insulation	Approx. outer diameter	Approx. weight LXHIOV	Current carrying capacity 		Cond. max. short-circuit current, t=1s	Cond. DC resistance @ 20°C	Inductance 	Capacitance
U _o / U	Um					In air	Buried				
(kV)	(kV)					(mm²)	(mm)				
Aluminium conductor											
3,6/6	7,2	25	12,5	39,0	1 935	142	115	2,4	1,2000	0,38	0,27
		35	13,5	41,5	2 140	170	136	3,3	0,8680	0,36	0,30
		50	15,0	44,0	2 395	204	162	4,7	0,6410	0,35	0,33
		70	16,5	48,0	2 785	253	198	6,6	0,4430	0,32	0,38
		95	18,0	52,0	3 270	304	235	9,0	0,3200	0,30	0,42
		120	20,0	56,0	3 725	351	268	11,3	0,2530	0,29	0,47
		150	21,0	59,0	4 170	398	303	14,2	0,2060	0,29	0,51
		185	22,5	62,5	4 725	455	343	17,5	0,1640	0,28	0,55
		240	25,5	68,5	5 750	531	397	22,7	0,1250	0,27	0,60
		300	28,5	76,0	6 860	606	448	28,3	0,1000	0,26	0,63
	400	32,0	83,5	8 390	696	511	37,8	0,0778	0,26	0,66	
6/10	12	25	14,5	43,5	2 255	142	115	2,4	1,2000	0,40	0,22
		35	15,5	46,0	2 480	170	136	3,3	0,8680	0,39	0,24
		50	17,0	49,0	2 765	204	162	4,7	0,6410	0,37	0,26
		70	18,5	52,5	3 175	253	198	6,6	0,4430	0,34	0,30
		95	20,0	56,5	3 720	304	235	9,0	0,3200	0,32	0,33
		120	22,0	60,5	4 210	351	268	11,3	0,2530	0,31	0,37
		150	23,0	63,5	4 680	398	303	14,2	0,2060	0,30	0,39
		185	24,5	67,0	5 260	455	343	17,5	0,1640	0,29	0,43
		240	27,0	72,0	6 170	531	397	22,7	0,1250	0,28	0,47
		300	30,0	79,0	7 255	606	448	28,3	0,1000	0,27	0,53
	400	32,5	85,5	8 620	696	511	37,8	0,0778	0,26	0,59	
8,7/15	17,5	25	17,0	49,0	2 665	142	115	2,4	1,2000	0,43	0,18
		35	18,0	51,5	2 905	170	136	3,3	0,8680	0,41	0,19
		50	19,0	54,0	3 210	204	162	4,7	0,6410	0,39	0,21
		70	20,5	58,0	3 650	253	198	6,6	0,4430	0,36	0,24
		95	22,5	61,5	4 210	304	235	9,0	0,3200	0,34	0,27
		120	24,0	65,5	4 725	351	268	11,3	0,2530	0,33	0,29
		150	25,5	68,5	5 285	398	303	14,2	0,2060	0,32	0,31
		185	27,0	72,0	5 835	455	343	17,5	0,1640	0,31	0,34
		240	29,0	77,5	6 830	531	397	22,7	0,1250	0,30	0,37
		300	32,0	84,0	7 965	606	448	28,3	0,1000	0,29	0,42
	400	35,0	90,5	9 390	696	511	37,8	0,0778	0,27	0,46	

MEDIUM VOLTAGE CABLE

Voltage		Conductor cross-section	Diameter over insulation	Approx. outer diameter	Approx. weight LXHIOV	Current carrying capacity 		Cond. max. short-circuit current, t=1s	Cond. DC resistance @ 20°C	Inductance 	Capacitance
U ₀ / U	Um					In air	Buried				
(kV)	(kV)	(mm ²)	(mm)	(mm)	(kg/km)	(A)	(A)	(kA)	(Ω/km)	(mH/km)	(μF/km)
Aluminium conductor											
12/20	24	35	20,0	56,0	3 315	170	136	3,3	0,8680	0,43	0,17
		50	21,0	58,5	3 645	204	162	4,7	0,6410	0,41	0,18
		70	22,5	62,5	4 145	253	198	6,6	0,4430	0,38	0,21
		95	24,5	66,5	4 740	304	235	9,0	0,3200	0,36	0,23
		120	26,0	70,5	5 285	351	268	11,3	0,2530	0,34	0,25
		150	27,5	73,5	5 810	398	303	14,2	0,2060	0,33	0,27
		185	29,0	76,5	6 450	455	343	17,5	0,1640	0,32	0,29
		240	31,0	82,0	7 495	531	397	22,7	0,1250	0,31	0,32
		300	34,0	88,5	8 640	606	448	28,3	0,1000	0,30	0,35
		400	37,0	95,0	10 165	696	511	37,8	0,0778	0,29	0,39
18/30	36	50	26,0	70,0	4 915	204	162	4,7	0,6410	0,45	0,14
		70	27,5	74,0	5 520	253	198	6,6	0,4430	0,41	0,16
		95	29,5	78,0	6 170	304	235	9,0	0,3200	0,39	0,17
		120	31,0	82,0	6 865	351	268	11,3	0,2530	0,38	0,19
		150	32,5	85,0	7 375	398	303	14,2	0,2060	0,37	0,20
		185	34,0	88,5	8 160	455	343	17,5	0,1640	0,35	0,21
		240	36,0	93,5	9 190	531	397	22,7	0,1250	0,34	0,24
		300	39,0	100,0	10 515	606	448	28,3	0,1000	0,32	0,26
		400	42,0	106,5	12 115	696	511	37,8	0,0778	0,31	0,29

Current carrying capacity calculated considering the following conditions:

Maximum conductor temperature = 90°C

Cables in air: Ambient temperature = 30°C

Cables directly buried: Ground temperature = 20°C · Depth of laying = 0,7 m · Thermal resistivity of soil = 1,0 K.m/W

MEDIUM VOLTAGE CABLE

Unarmoured · XLPE Insulation · Collective Screen · BS 7870-4.20

APPLICATION

Cable for power distribution and power supply stations used in Utility and Industrial applications, for rated voltages 6,35/11kV. Suitable for fixed installations, indoor or outdoor, in open air on cable trays, or underground in ducts or directly buried. Non radial field cable.

CABLE DESIGNATION

Al / XLPE / Cu Wire screen / PE: LSXHOE

CONSTRUCTION CHARACTERISTICS

Conductor

Solid aluminium conductor, circular, class 1 per BS EN 60228.

Insulation

Semi-conductive screen over the conductor, XLPE (cross-linked polyethylene) insulation and semi-conductive screen over the insulation (strippable or bonded), applied by simultaneous extrusion in just one operation.

Fillers

Extruded polymeric material.

Collective Metallic Screen

Applied over a semi-conductive tape firmly holding the three cores and fillers. Composed by annealed copper wires helically wound. An equalising copper tape is applied in an open counter-helix. Plastic tape is applied over the metallic screen.

Oversheath

Extruded MDPE.

Optionally, a Low Smoke Halogen Free thermoplastic compound can be used for cables with need for improved fire behaviour.

COLOUR AND CABLE MARKING

Red. Oversheath marked at regular intervals with the following information:

ELECTRIC CABLE 11000V BS7870-4.20 CABELTE 3 x <cond. cross-section> AL <year of manufacture> <metric marking>

GENERAL CHARACTERISTICS

Construction and test standards	BS EN 60228 · BS 7870-4.20
Rated voltage U_0 / $U(U_m)$	6,35/11 (12) kV
Standard cross-section of wire screen	35 · 50 · 70 · 95
Test voltage	4 x U_0
Conductor maximum operating temperature	90°C
Maximum short-circuit temperature	250°C ($t \leq 5s$)
Minimum bending radius – during installation (mm)	20 x d
Minimum bending radius – after installation (mm)	15 x d
Maximum pulling force over conductor (N)	30 x S

S – conductor cross-section (mm^2) · d – cable outer diameter (mm)



We reserve the right to modify, at any time, without any obligation and without prior notice, the specifications and other technical data in this document, which must be confirmed when ordering.



DIMENSIONAL CHARACTERISTICS

Voltage		Conductor cross-section (mm²)	Diameter over insulation (mm)	Approx. outer diameter (mm)	⁽¹⁾ Approx. weight (kg/km)
U ₀ / U (kV)	U _m (kV)				
6,35/11	12	95	19,0	55,0	2 460
		185	23,5	65,0	4 370
		300	28,0	74,5	5 270

(1) – For cables with a collective metallic screen of 35 mm².

MEDIUM VOLTAGE CABLE

APPLICATION

Cable for power distribution and power supply stations used in Utility and Industrial applications, for rated voltages up to 18/30kV. Suitable for fixed installations, directly buried. Good mechanical protection.

CABLE DESIGNATION

Cu / XLPE / Cu Tape screen / Steel Tape armour / PVC or PE: **XHIAV · XHIAE**

Cu / XLPE / Cu Wire screen / Steel Tape armour / PVC or PE: **XHIOAV · XHIOAE**

Al / XLPE / Cu Tape screen / Steel Tape armour / PVC or PE: **LXHIAV · LXHIAE**

Al / XLPE / Cu Wire screen / Steel Tape armour / PVC or PE: **LXHIOAV · LXHIOAE**

Cu / XLPE / Cu Tape screen / Galv. Steel Wire armour / PVC or PE: **XHIRV · XHIRE**

Cu / XLPE / Cu Wire screen / Galv. Steel Wire armour / PVC or PE: **XHIORV · XHIORE**

Al / XLPE / Cu Tape screen / Galv. Steel Wire armour / PVC or PE: **LXHIRV · LXHIRE**

Al / XLPE / Cu Wire screen / Galv. Steel Wire armour / PVC or PE: **XHIORV · LXHIORE**

CONSTRUCTION CHARACTERISTICS

Conductor

Plain annealed Copper or Aluminium, circular, stranded, class 2 per IEC 60228.

Insulation

Semi-conductive screen over the conductor, XLPE (cross-linked polyethylene) insulation and Semi-conductive screen over the insulation (strippable¹), applied by simultaneous extrusion in just one operation.

(1) Bonded upon agreement.

Metallic Screen

Copper wire screen – annealed copper wires helically wound and an equalising copper tape applied in an open counter-helix. Plastic tape is applied over the screen.

Or **Copper tape screen** – a copper tape, standard thickness 0,1 mm helically applied with overlap.

Fillers

Extruded polymeric material.

Inner Sheath

Extruded PVC or PE.

Armour

Steel double tape, helically applied.

Or Galvanized steel wires, helically applied, tightened with plastic tapes.

Oversheath

Extruded PVC, type ST2 or PE type ST7.

Optionally, a Low Smoke Halogen Free thermoplastic compound can be used for cables with need for improved fire behaviour.

COLOUR AND CABLE MARKING

Black (other upon agreement).

Oversheath marked at regular intervals with the following information:

CABELTE <cable designation> 3 x <cond. cross-section>/<screen cross-section (if copper wires screen)> <rated voltage> <order of manufacture>/<year of manufacture> <metric marking>



GENERAL CHARACTERISTICS

Construction and test standards	IEC 60228 IEC 60502-2
Rated voltage $U_0/U(Um)$	3,6/6 (7,2) kV · 6/10 (12) kV · 8,7/15 (17,5) kV · 12/20 (24) kV · 18/30 (36) kV
Standard cross-section of wire screen	16 · 25 · 30 · 35
Test voltage	3,5 x U_0
Conductor maximum operating temperature	90°C
Maximum short-circuit temperature	250°C ($t \leq 5s$)
Minimum bending radius – during installation (mm)	15 x d
Minimum bending radius – after installation (mm)	10 x d
Maximum pulling force over conductor (N)	Copper – 50 x S Aluminium – 30 x S
Flame retardant (for PVC oversheath)	IEC 60332-1-2 · EN 60332-1-2 (cable vertically mounted, length of charred cable ≤ 540 mm).
Fire retardant (for PVC oversheath, upon agreement)	IEC 60332-3-24 · EN 60332-3-24 (bunch of cables vertically mounted on a ladder, length of charred cable $\leq 2,5$ m)

S – conductor cross-section (mm²)

d – cable outer diameter (mm)

ELECTRICAL AND DIMENSIONAL CHARACTERISTICS

Copper conductor constructions

Voltage		Conductor cross-section	Diameter over insulation	Approx. outer diameter	Approx. weight XH10AV	Current carrying capacity 		Cond. max. short-circuit current, t=1s	Cond. DC resistance @ 20°C	Inductance 	Capacitance
U ₀ / U (kV)	Um (kV)					In air (A)	Buried (A)				
Copper conductor											
3,6/6	7,2	25	13,0	44,5	3 320	143	148	3,6	0,7270	0,38	0,27
		35	14,0	47,0	3 775	172	177	5,0	0,5240	0,36	0,30
		50	15,0	49,5	4 340	205	209	7,5	0,3870	0,34	0,33
		70	16,5	54,0	5 280	253	255	10,0	0,2680	0,32	0,38
		95	18,5	58,0	6 325	307	304	13,6	0,1930	0,30	0,43
		120	20,0	61,5	7 290	352	345	17,2	0,1530	0,29	0,48
		150	21,0	64,5	8 300	397	388	21,5	0,1240	0,28	0,51
		185	22,5	67,5	9 640	453	437	26,5	0,0991	0,28	0,54
		240	25,5	75,0	11 985	529	503	34,3	0,0754	0,27	0,60
		300	28,5	82,0	14 475	599	563	42,9	0,0601	0,26	0,63
		*400	32,0	91,5	18 920	683	631	57,2	0,0470	0,26	0,66

MEDIUM VOLTAGE CABLE

Voltage		Conductor cross-section	Diameter over insulation	Approx. outer diameter	Approx. weight XH10AV	Current carrying capacity 		Cond. max. short-circuit current, t=1s	Cond. DC resistance @ 20°C	Inductance 	Capacitance
U ₀ / U	Um					In air	Buried				
(kV)	(kV)	(mm ²)	(mm)	(mm)	(kg/km)	(A)	(A)	(kA)	(Ω/km)	(mH/km)	(μF/km)
Copper conductor											
6/10	12	25	15,0	49,0	3 775	143	148	3,6	0,7270	0,40	0,22
		35	16,0	51,5	4 255	172	177	5,0	0,5240	0,38	0,24
		50	17,0	54,5	4 850	205	209	7,5	0,3870	0,37	0,27
		70	18,5	58,5	5 815	253	255	10,0	0,2680	0,34	0,30
		95	20,5	62,5	6 830	307	304	13,6	0,1930	0,32	0,34
		120	22,0	66,5	7 885	352	345	17,2	0,1530	0,31	0,37
		150	23,0	69,5	8 960	397	388	21,5	0,1240	0,30	0,39
		185	24,5	72,5	10 290	453	437	26,5	0,0991	0,29	0,42
		240	27,0	78,5	12 455	529	503	34,3	0,0754	0,28	0,48
		300	30,0	85,0	14 935	599	563	42,9	0,0601	0,27	0,53
		*400	33,0	93,0	19 215	683	631	57,2	0,0470	0,26	0,59
8,7/15	17,5	25	17,0	54,5	4 335	143	148	3,6	0,7270	0,43	0,18
		35	18,0	57,0	4 835	172	177	5,0	0,5240	0,41	0,20
		50	19,0	59,5	5 470	205	209	7,5	0,3870	0,39	0,21
		70	21,0	63,5	6 425	253	255	10,0	0,2680	0,36	0,24
		95	22,5	67,5	7 505	307	304	13,6	0,1930	0,34	0,27
		120	24,5	71,5	8 600	352	345	17,2	0,1530	0,33	0,29
		150	25,5	74,5	9 730	397	388	21,5	0,1240	0,32	0,31
		185	26,5	77,5	10 985	453	437	26,5	0,0991	0,31	0,33
		240	29,5	83,5	13 290	529	503	34,3	0,0754	0,30	0,38
		*300	32,0	91,5	16 705	599	563	42,9	0,0601	0,29	0,42
		*400	35,0	98,5	20 225	683	631	57,2	0,0470	0,27	0,46
12/20	24	35	20,0	61,5	5 325	172	177	5,0	0,5240	0,43	0,17
		50	21,0	64,5	6 000	205	209	7,5	0,3870	0,41	0,19
		70	23,0	68,5	7 045	253	255	10,0	0,2680	0,37	0,21
		95	24,5	72,5	8 190	307	304	13,6	0,1930	0,36	0,23
		120	26,5	76,5	9 280	352	345	17,2	0,1530	0,34	0,25
		150	27,5	79,0	10 330	397	388	21,5	0,1240	0,33	0,27
		185	28,5	82,0	11 760	453	437	26,5	0,0991	0,32	0,28
		*240	31,5	90,0	14 985	529	503	34,3	0,0754	0,31	0,32
		*300	34,0	96,5	17 595	599	563	42,9	0,0601	0,30	0,35
		*400	37,0	103,0	21 170	683	631	57,2	0,0470	0,29	0,39
18/30	36	50	26,0	76,0	7 595	205	209	7,5	0,3870	0,45	0,14
		70	28,0	80,5	8 730	253	255	10,0	0,2680	0,41	0,16
		95	29,5	86,0	10 845	307	304	13,6	0,1930	0,39	0,18
		120	31,5	90,0	12 105	352	345	17,2	0,1530	0,38	0,19
		*150	32,5	92,5	13 170	397	388	21,5	0,1240	0,36	0,20
		*185	33,5	95,5	14 725	453	437	26,5	0,0991	0,35	0,21
		*240	36,5	102,0	17 205	529	503	34,3	0,0754	0,34	0,24
		*300	39,0	108,0	19 950	599	563	42,9	0,0601	0,32	0,26
		*400	42,0	115,0	23 760	683	631	57,2	0,0470	0,31	0,29

*Only for steel tape armoured cables.

Aluminium conductor constructions

Voltage		Conductor cross-section	Diameter over insulation	Approx. outer diameter	Approx. weight LXHI01AV	Current carrying capacity 		Cond. max. short-circuit current, t=1s	Cond. DC resistance @ 20°C	Inductance 	Capacitance
U ₀ / U	Um					In air	Buried				
(kV)	(kV)	(mm ²)	(mm)	(mm)	(kg/km)	(A)	(A)	(kA)	(Ω/km)	(mH/km)	(μF/km)
Aluminium conductor											
3,6/6	7,2	25	12,5	44,0	2 860	111	115	2,4	1,2000	0,38	0,27
		35	13,5	46,5	3 140	133	136	3,3	0,8680	0,36	0,30
		50	15,0	49,5	3 460	159	162	4,7	0,6410	0,35	0,33
		70	16,5	53,5	3 965	196	198	6,6	0,4430	0,32	0,38
		95	18,0	57,5	4 575	238	236	9,0	0,3200	0,30	0,42
		120	20,0	61,0	5 095	274	268	11,3	0,2530	0,29	0,47
		150	21,0	64,5	5 650	309	302	14,2	0,2060	0,29	0,51
		185	22,5	68,0	6 320	354	342	17,5	0,1640	0,28	0,55
		240	25,5	74,5	7 545	415	395	22,7	0,1250	0,27	0,60
		300	28,5	82,0	8 845	472	444	28,3	0,1000	0,26	0,63
		*400	32,0	91,0	11 485	545	504	37,8	0,0778	0,26	0,66
6/10	12	25	14,5	49,0	3 310	111	115	2,4	1,2000	0,40	0,22
		35	15,5	51,5	3 620	133	136	3,3	0,8680	0,39	0,24
		50	17,0	54,0	3 965	159	162	4,7	0,6410	0,37	0,26
		70	18,5	58,0	4 500	196	198	6,6	0,4430	0,34	0,30
		95	20,0	62,0	5 075	238	236	9,0	0,3200	0,32	0,33
		120	22,0	66,0	5 690	274	268	11,3	0,2530	0,31	0,37
		150	23,0	69,5	6 305	309	302	14,2	0,2060	0,30	0,39
		185	24,5	72,5	6 975	354	342	17,5	0,1640	0,29	0,43
		240	27,0	78,0	8 015	415	395	22,7	0,1250	0,28	0,47
		300	30,0	85,0	9 305	472	444	28,3	0,1000	0,27	0,53
		*400	32,5	93,0	11 775	545	504	37,8	0,0778	0,26	0,59
8,7/15	17,5	25	17,0	54,5	3 870	111	115	2,4	1,2000	0,43	0,18
		35	18,0	57,0	4 200	133	136	3,3	0,8680	0,41	0,19
		50	19,0	59,0	4 530	159	162	4,7	0,6410	0,39	0,21
		70	20,5	63,5	5 100	196	198	6,6	0,4430	0,36	0,24
		95	22,5	67,0	5 750	238	236	9,0	0,3200	0,34	0,27
		120	24,0	71,5	6 405	274	268	11,3	0,2530	0,33	0,29
		150	25,5	74,5	7 075	309	302	14,2	0,2060	0,32	0,31
		185	27,0	77,5	7 670	354	342	17,5	0,1640	0,31	0,34
		240	29,0	83,5	8 845	415	395	22,7	0,1250	0,30	0,37
		*300	32,0	91,5	11 075	472	444	28,3	0,1000	0,29	0,42
		*400	35,0	98,5	12 785	545	504	37,8	0,0778	0,27	0,46

MEDIUM VOLTAGE CABLE

Voltage		Conductor cross-section	Diameter over insulation	Approx. outer diameter	Approx. weight LXHI01AV	Current carrying capacity 		Cond. max. short-circuit current, t=1s	Cond. DC resistance @ 20°C	Inductance 	Capacitance
U ₀ / U	Um					In air	Buried				
(kV)	(kV)	(mm ²)	(mm)	(mm)	(kg/km)	(A)	(A)	(kA)	(Ω/km)	(mH/km)	(μF/km)
Aluminium conductor											
12/20	24	35	20,0	61,0	4 685	133	136	3,3	0,8680	0,43	0,17
		50	21,0	64,0	5 110	159	162	4,7	0,6410	0,41	0,18
		70	22,5	68,0	5 710	196	198	6,6	0,4430	0,38	0,21
		95	24,5	72,0	6 435	238	236	9,0	0,3200	0,36	0,23
		120	26,0	76,0	7 080	274	268	11,3	0,2530	0,34	0,25
		150	27,5	79,0	7 680	309	302	14,2	0,2060	0,33	0,27
		185	29,0	82,5	8 445	354	342	17,5	0,1640	0,32	0,29
		*240	31,0	89,5	10 535	415	395	22,7	0,1250	0,31	0,32
		*300	34,0	96,5	11 970	472	444	28,3	0,1000	0,30	0,35
		*400	37,0	103,0	13 730	545	504	37,8	0,0778	0,29	0,39
18/30	36	50	26,0	76,0	6 700	159	162	4,7	0,6410	0,45	0,14
		70	27,5	80,0	7 445	196	198	6,6	0,4430	0,41	0,16
		95	29,5	85,5	9 015	238	236	9,0	0,3200	0,39	0,17
		120	31,0	89,5	9 895	274	268	11,3	0,2530	0,38	0,19
		*150	32,5	92,5	10 515	309	302	14,2	0,2060	0,37	0,20
		*185	34,0	96,0	11 420	354	342	17,5	0,1640	0,35	0,21
		*240	36,0	101,5	12 750	415	395	22,7	0,1250	0,34	0,24
		*300	39,0	108,0	14 320	472	444	28,3	0,1000	0,32	0,26
		*400	42,0	115,0	16 220	545	504	37,8	0,0778	0,31	0,29

*Only for steel tape armoured cables.

Current carrying capacity calculated considering the following conditions:

Maximum conductor temperature = 90°C

Cables in air: Ambient temperature = 30°C

Cables directly buried: Ground temperature = 20°C · Depth of laying = 0,7m · Thermal resistivity of soil = 1,0K.m/W

MEDIUM VOLTAGE CABLE

APPLICATION

Three single-core cables pre-assembled without messenger, for power distribution and power supply stations used in Utility and Industrial applications, for rated voltages up to 18/30kV. Suitable for fixed installations, indoor or outdoor, in open air on cable trays, or underground in ducts or directly buried.

CABLE DESIGNATION

Cu / XLPE / Cu Tape screen / PVC or PE: **XHIV · XHIE**

Cu / XLPE / Cu Wire screen / PVC or PE: **XHIOV · XHIOE**

Al / XLPE / Cu Tape screen / PVC or PE: **LXHIV · LXHIE**

Al / XLPE / Cu Wire screen / PVC or PE: **LXHIOV · LXHIOE**

Watertight constructions: **XHIOE(be)** or **XHIOE(cbe)**

LXHIOE(be) or **LXHIOE(cbe)**

CONSTRUCTION CHARACTERISTICS

Conductor

Plain annealed Copper or Aluminium, circular, stranded, class 2 per IEC 60228.

Insulation

Semi-conductive screen over the conductor, XLPE (cross-linked polyethylene) insulation and Semi-conductive screen over the insulation (strippable¹), applied by simultaneous extrusion in just one operation.

(1) Bonded upon agreement.

Metallic Screen

Copper wire screen – annealed copper wires helically wound and an equalising copper tape applied in an open counter-helix.

Plastic tape is applied over the screen.

Or **Copper tape screen** – a copper tape, standard thickness 0,1 mm helically applied with overlap.

Oversheath

Extruded PVC type ST2 or DMV30, or PE type ST7 or DMP15.

Watertightness option

(be) – Metallic screen longitudinally watertight. Assured by application of a waterblocking tape over the metallic screen. A waterblocking yarn under the screen may be considered.

(cbe) – Conductor and metallic screen longitudinally watertight. Conductor: assured by water-blocking yarns and/or tapes between wire layers; Metallic screen: assured by application of a water-blocking tape over metallic screen. A waterblocking yarn under the screen may be considered.

COLOUR AND CABLE MARKING

Black (other upon agreement).

Oversheath marked at regular intervals with the following information:

CABELTE <phase n^o> <cable designation> 1 x <cond. cross-section>/<screen cross-section (if copper wires screen)> <rated voltage> <order of manufacture>/<year of manufacture> <metric marking>



GENERAL CHARACTERISTICS

Construction and test standards	IEC 60228 IEC 60502-2 · HD 620 S2
Rated voltage $U_0/ U(Um)$	3,6/6 (7,2) kV · 6/10 (12) kV · 8,7/15 (17,5) kV · 12/20 (24) kV · 18/30 (36) kV
Standard cross-section of wire screen	16 · 25 · 30 · 35
Test voltage	3,5 x U_0
Conductor maximum operating temperature	90°C
Maximum short-circuit temperature	250°C (t ≤ 5s)
Minimum bending radius – during installation (mm)	12 x D
Minimum bending radius – after installation (mm)	9 x D
Maximum pulling force over conductor (N)	Copper – 50 x S Aluminium – 30 x S
Flame retardant (for PVC oversheath)	IEC 60332-1-2 · EN 60332-1-2 (cable vertically mounted, length of charred cable ≤ 540 mm).

S – conductor cross-section (mm²)
D – diameter over the three cores aprox. 2,16 x d
d – single core cable outer diameter (mm)

MEDIUM VOLTAGE CABLE

APPLICATION

Three single-core cables pre-assembled with steel messenger, for power distribution and power supply stations used in Utility and Industrial applications, for rated voltages up to 18/30kV.

Suitable for aerial installations.

CABLE DESIGNATION

Al / XLPE / Cu Tape screen / PVC or PE + Messenger: **LXHIVS · LXHIES**

Al / XLPE / Cu Wire screen / PVC or PE + Messenger: **LXHIOVS · LXHIOES**

Watertight constructions: **LXHIOES(be)** or **LXHIOES(cbe)**

CONSTRUCTION CHARACTERISTICS

Conductor

Aluminium conductor, circular, stranded, class 2 per IEC 60288.

Insulation

Semi-conductive screen over the conductor, XLPE (cross-linked polyethylene) insulation and Semi-conductive screen over the insulation (strippable¹), applied by simultaneous extrusion in just one operation.

(1) Bonded upon agreement.

Metallic Screen

Copper wire screen – annealed copper wires helically wound and an equalising copper tape applied in an open counter-helix. Cross-section area of screen according to client request.

A wrapping plastic tape is applied over the screen.

Or **Copper tape screen** – a copper tape, standard thickness 0,1 mm helically applied with overlap.

Oversheath

Extruded PVC type ST2 or DMV30, or PE type ST7 or DMP15.

Watertightness option

(be) – Metallic screen longitudinally watertight. Assured by application of a waterblocking tape over the metallic screen. A waterblocking yarn under the screen may be considered.

(cbe) – Conductor and metallic screen longitudinally watertight. Conductor: Assured by waterblocking yarns and/or tapes between wire layers; Metallic screen: Assured by application of a waterblocking tape over metallic screen. A waterblocking yarn under the screen may be considered.

COLOUR AND CABLE MARKING

Black (other upon agreement).

Oversheath marked at regular intervals with the following information:

CABELTE <phase n°> <cable designation> 1 x <cond. cross-section>/<screen cross-section (if copper wires screen)> <rated voltage> <order of manufacture>/<year of manufacture> <metric marking>



GENERAL CHARACTERISTICS

Construction and test standards	IEC 60228 IEC 60502-2 • HD 620 S2
Rated voltage $U_0/ U(Um)$	3,6/6 (7,2) kV • 6/10 (12) kV • 8,7/15 (17,5) kV • 12/20 (24) kV • 18/30 (36) kV
Standard cross-section of wire screen	16 • 25 • 30 • 35
Test voltage	3,5 x U_0
Conductor maximum operating temperature	90°C
Maximum short-circuit temperature	250°C (t ≤ 5s)
Minimum bending radius – during installation (mm)	12 x D
Minimum bending radius – after installation (mm)	9 x D
Maximum pulling force over conductor (N)	Copper – 50 x S Aluminium – 30 x S
Flame retardant (for PVC oversheath)	IEC 60332-1-2 • EN 60332-1-2 (cable vertically mounted, length of charred cable ≤ 540 mm).

S – conductor cross-section (mm²)
D – diameter over the three cores aprox. 2,16 x d
d – single core cable outer diameter (mm)

HIGH VOLTAGE CABLE

APPLICATION

Cable for power distribution and power supply stations used in Utility and Industrial applications, for rated voltages 26/45kV and 36/60kV. Suitable for fixed installations, underground in ducts or directly buried.

CABLE DESIGNATION

Cu / XLPE / Cu Wire Screen / Al Tape / PE: XHIOLE(cbe)

Al / XLPE / Cu Wire Screen / Al Tape / PE: LXHIOLE(cbe)

CONSTRUCTION CHARACTERISTICS

Conductor

Plain annealed Copper or Aluminium, circular, stranded, class 2 per IEC 60228.

Insulation

Semi-conductive screen over the conductor, XLPE (cross-linked polyethylene) insulation and Semi-conductive screen over the insulation (adhered), applied by simultaneous extrusion in just one operation.

Metallic Screen

Annealed copper wires, helically wound and an equalising copper tape applied in an open counter-helix. Cross-section area of screen according to client request.

Oversheath

Aluminium copolymer coated tape, longitudinally applied, bonded to the extruded PE oversheath, type ST7.

Upon agreement, an extruded semi-conductive thin layer may be applied on the surface of the oversheath, to facilitate the detection and location of defective points.

Watertightness option

(cbe) – Conductor and metallic screen longitudinally watertight. Conductor: Use of waterblocking yarns and/or tapes between wire layers; Metallic screen: Assured by application of semi-conductive waterblocking tapes under and over the screen.

L – Radial watertightness provided by the aluminium-coated tape.

COLOUR AND CABLE MARKING

Black (other upon agreement). Oversheath marked at regular intervals with the following information:

CABELTE < cable designation > 1 x < cond. cross-section > / < screen cross-section (if copper wires screen) > < rated voltage > < order of manufacture > / < year of manufacture > < metric marking >

GENERAL CHARACTERISTICS

Construction and test standards	IEC 60228 · IEC 60840
Rated voltage U_0 / $U(U_m)$	26/45 (52) kV – 36/60 (72,5) kV
Test voltage	2,5 x U_0
Conductor maximum operating temperature	90°C
Maximum short-circuit temperature	250°C ($t \leq 5s$)



GENERAL CHARACTERISTICS

Minimum bending radius – during installation (mm) 30 x d

Minimum bending radius – after installation (mm) 15 x d

Maximum pulling force over conductor (N) Copper – 50 x S
Aluminium – 30 x S

d – cable outer diameter (mm) • S – conductor cross-section (mm²)

ELECTRICAL AND DIMENSIONAL CHARACTERISTICS

Copper conductor constructions

Voltage		Conductor cross-section	Diameter over insulation	Approx. outer diameter	Approx. weight	Current carrying capacity 		Cond. max. short-circuit current, t=1s	Cond. DC resistance @ 20°C	Inductance 	Capacitance
U _o / U (kV)	Um (kV)					In air	Buried				
36/60	72,5	185	43,5	60,0	4.980	526	407	26,5	0,0991	0,46	0,15
		400	51,6	68,0	7.250	795	578	57,2	0,0470	0,40	0,20
		630	60,6	77,0	9.970	1 015	710	90,1	0,0283	0,37	0,25

Aluminium conductor constructions

Voltage		Conductor cross-section	Diameter over insulation	Approx. outer diameter	Approx. weight	Current carrying capacity 		Cond. max. short-circuit current, t=1s	Cond. DC resistance @ 20°C	Inductance 	Capacitance
U _o / U (kV)	Um (kV)					In air	Buried				
36/60	72,5	185	43,5	60,0	3.900	415	322	17,5	0,164	0,46	0,15
		400	51,5	68,0	4.840	637	467	37,8	0,0778	0,40	0,20
		630	60,5	77,0	6.090	857	597	59,5	0,0469	0,37	0,25
		1 000	69,0	86,0	7.620	1 082	724	94,5	0,0291	0,34	0,29

Current carrying capacity calculated considering the following conditions:

- Maximum conductor temperature = 90°C

- Cables in air: Ambient temperature = 30°C

- Cables directly buried: Ground temperature = 20°C • Depth of laying = 1,3 m • Thermal resistivity of soil = 1,2K.m/W

BARE CONDUCTORS FOR AERIAL POWER LINES

- AAC – All aluminium conductor
- AAAC – All aluminium alloy conductor
- ACSR – Aluminium conductor steel reinforced
- AAACSR – Aluminium alloy conductor steel reinforced
- ACSR/AW – Aluminium alloy conductor Aluminium clad steel reinforced
- ACAR – Aluminium conductor Aluminium alloy reinforced

Optical Power Ground Wire

- OPGW – stainless steel tube
- OPGW – aluminium tube

APPLICATION

Conductors used in short distance overhead distribution in high voltage power substations. Also used as covered conductors for low and medium voltage, suitable for be insulated or covered.

CONSTRUCTION CHARACTERISTICS

Conductors are formed by (hard drawn) aluminium bare wires concentrically stranded in layers. All wires have the same nominal diameter. For covered conductors the bare conductors can be compacted in order to reduce the amount of insulation material.

AAC – “All Aluminium Conductor”.

GENERAL CHARACTERISTICS

Aluminium with a conductivity of 61% IACS

Good electrical features

Good resistance to corrosion

Easy to compress

ELECTRICAL AND DIMENSIONAL CHARACTERISTICS

CENELEC EN50182:2001 standard

Characteristics of aluminium conductors – Type AL 1 – Spain

Code	Old code	Conductor area (mm ²)	N.º of wires	Wire diameter (mm)	Nominal diameter (mm)	Linear mass (kg/km)	Rated strength (kN)	Electrical resist. dc. 20°C (Ω/km)
28-AL1	L 28	27,8	7	2,25	6,75	76,1	5,01	1,0268
43-AL1	L 40	43,1	7	2,80	8,40	117,8	7,33	0,6630
55-AL1	L 56	54,6	7	3,15	9,45	149,1	9,00	0,5239
76-AL1	L 80	75,5	19	2,25	11,3	207,6	13,60	0,3804
117-AL1	L 110	117,0	19	2,80	14,0	321,5	19,89	0,2456
148-AL1	L 145	148,1	19	3,15	15,8	407,0	24,43	0,1941
188-AL1	L 180	188,1	19	3,55	17,8	516,9	30,09	0,1528
279-AL1	L 280	279,3	37	3,10	21,7	770,2	46,08	0,1033
381-AL1	L 400	381,0	61	2,82	25,4	1 054,1	64,77	0,0759
454-AL1	L 450	454,5	61	3,08	27,7	1 257,5	74,99	0,0637
547-AL1	L 550	547,3	61	3,38	30,4	1 514,4	90,31	0,0529
638-AL1	L 630	638,3	61	3,65	32,9	1 766,0	102,12	0,0453

Note 1 – Outer layer stranding direction: Right-hand (Z).



CENELEC EN50182:2001 standard

Characteristics of aluminium conductors – Type AL 1 – Germany

Code	Old code	Conductor area (mm ²)	N.º of wires	Wire diameter (mm)	Nominal diameter (mm)	Linear mass (Kg/km)	Rated strength (kN)	Electrical resist. d.c. 20°C (Ω/km)	Final modulus of elasticity (N/mm ²)	Final coefficient of linear expansion (1/K)	Current carrying capacity A (1)
16-AL1	16	15,9	7	1,70	5,10	43,4	3,02	1,798 6	60 000	2,30E-05	110
24-AL1	25	24,2	7	2,10	6,30	66,3	4,36	1,178 7	60 000	2,30E-05	145
34-AL1	35	34,4	7	2,50	7,50	93,9	6,01	0,831 7	60 000	2,30E-05	180
49-AL1	50	49,5	7	3,00	9,00	135,2	8,41	0,577 6	60 000	2,30E-05	225
48-AL1	50	48,3	19	1,80	9,00	132,9	8,94	0,594 4	57 000	2,30E-05	225
66-AL1	70	65,8	19	2,10	10,5	180,9	11,85	0,436 7	57 000	2,30E-05	270
93-AL1	95	93,3	19	2,50	12,5	256,3	16,32	0,308 1	57 000	2,30E-05	340
117-AL1	120	117,0	19	2,80	14,0	321,5	19,89	0,245 6	57 000	2,30E-05	390
147-AL1	150	147,1	37	2,25	15,8	405,7	26,48	0,196 0	57 000	2,30E-05	455
182-AL1	185	181,6	37	2,50	17,5	500,9	31,78	0,158 8	57 000	2,30E-05	520
243-AL1	240	242,5	61	2,25	20,3	671,1	43,66	0,119 3	55 000	2,30E-05	625
299-AL1	300	299,4	61	2,50	22,5	828,5	52,40	0,096 6	55 000	2,30E-05	710
400-AL1	400	400,1	61	2,89	26,0	1 107,1	68,02	0,072 3	55 000	2,30E-05	855
500-AL1	500	499,8	61	3,23	29,1	1 382,9	82,47	0,057 9	55 000	2,30E-05	990
626-AL1	625	626,2	91	2,96	32,6	1 739,7	106,45	0,046 4	55 000	2,30E-05	1 140
802-AL1	800	802,1	91	3,35	36,9	2 228,3	132,34	0,036 2	55 000	2,30E-05	1 340
1000-AL1	1 000	999,7	91	3,74	41,1	2 777,3	159,95	0,029 1	55 000	2,30E-05	1 540

Note 1 – (1) Guideline values of current carrying capacity are valid up to a frequency of 60 Hz, assuming a wind velocity of 0,6 m/s, the effect of solar radiation for Germany, an initial ambient temperature of 35° C and a conductor temperature of 80° C. For special applications, when there is no air turbulence, the values should be reduced by 30 %.

Note 2 – Values of final modulus of elasticity and coefficient of linear expansion for the conductor sizes listed in the Table are used in Germany. Values for other conductor constructions may be calculated using the method given in IEC 61597.

Note 3 – Outer layer stranding direction: Right-hand (Z).

CENELEC EN50182:2001 standard

Characteristics of aluminium conductors – Type AL 1 – United Kingdom

Code	Code word	Conductor area (mm ²)	N.º of wires	Wire diameter (mm)	Nominal diameter (mm)	Linear mass (kg/km)	Rated strength (kN)	Electrical resist. d.c. 20°C (Ω/km)
23-AL1	MIDGE	23,3	7	2,06	6,18	63,8	4,20	1,2249
27-AL1	GNAT	26,9	7	2,21	6,63	73,4	4,83	1,0643
37-AL1	MOSQUITO	36,9	7	2,59	7,77	100,8	6,27	0,7749
43-AL1	LADYBIRD	42,8	7	2,79	8,37	117,0	7,28	0,6678
53-AL1	ANT	52,8	7	3,10	9,30	144,4	8,72	0,5409
64-AL1	FLY	63,6	7	3,40	10,2	173,7	10,49	0,4497
74-AL1	BLUEBOTTLE	73,6	7	3,66	11,0	201,3	11,78	0,3880
79-AL1	EARWIG	78,6	7	3,78	11,3	214,7	12,57	0,3638
84-AL1	GRASSHOPPER	84,1	7	3,91	11,7	229,7	13,45	0,3400
96-AL1	CLEGG	95,6	7	4,17	12,5	261,3	15,30	0,2989
106-AL1	WASP	106,0	7	4,39	13,2	289,6	16,95	0,2697
106-AL1	BEETLE	106,4	19	2,67	13,4	292,4	18,08	0,2701
132-AL1	BEE	132,0	7	4,90	14,7	360,8	21,12	0,2165
158-AL1	HORNET	157,6	19	3,25	16,3	433,2	26,01	0,1823
186-AL1	CATERPILLAR	185,9	19	3,53	17,7	511,1	29,75	0,1546
213-AL1	CHAFER	213,2	19	3,78	18,9	586,0	34,12	0,1348
238-AL1	SPIDER	237,6	19	3,99	20,0	652,9	38,01	0,1210
266-AL1	COCKROACH	265,7	19	4,22	21,1	730,4	42,52	0,1081
323-AL1	BUTTERFLY	322,7	19	4,65	23,3	886,8	51,63	0,0891
373-AL1	MOTH	373,1	19	5,00	25,0	1 025,3	59,69	0,0770
372-AL1	DRONE	372,4	37	3,58	25,1	1 027,1	59,69	0,0774
415-AL1	CENTIPEDE	415,2	37	3,78	26,5	1 145,1	66,43	0,0695
486-AL1	MAYBUG	486,1	37	4,09	28,6	1 340,6	77,78	0,0593
530-AL1	SCORPION	529,8	37	4,27	29,9	1 461,2	84,77	0,0544
628-AL1	CICADA	628,3	37	4,65	32,6	1 732,9	100,54	0,0459

Note 1 – Outer layer stranding direction: Right-hand (Z).

ASTM B-231 standard

Characteristics of aluminium conductors – Countries with North American influence

Code word	Size (AWG or kcmil)	Class	Composition	Conductor area (mm ²)	Outer diameter (mm)	Linear mass (Kg/km)	Rated strength (kN)	Electrical resist. d.c. 20°C (Ω/km)	Electrical resist. a.c. 25°C (Ω/km)	Electrical resist. a.c. 75°C (Ω/km)	Current carrying capacity A (1)
PEACHBELL	6	A	7 x 1,56	13,21	4,65	36,6	2,500	2,1702	2,2129	2,6499	110
ROSE	4	A	7 x 1,96	21,12	5,88	58,3	3,290	1,3638	1,3914	1,6663	145
IRIS	2	A,AA	7 x 2,47	33,54	7,41	92,7	6,010	0,8570	0,8750	1,0486	195
PANSY	1	A,AA	7 x 2,78	42,49	8,34	116,8	7,300	0,6801	0,6942	0,8310	225
POPPY	1/0	A,AA	7 x 3,12	53,52	9,36	147,5	8,860	0,5390	0,5499	0,6588	260
ASTER	2/0	A,AA	7 x 3,50	67,34	10,50	185,9	11,170	0,4275	0,4374	0,5226	305
PHLOX	3/0	A,AA	7 x 3,93	84,91	11,79	234,4	13,530	0,3392	0,3468	0,4150	350
OXLIP	4/0	A,AA	7 x 4,42	107,4	13,26	295,6	17,050	0,2689	0,2747	0,3288	410
SNEEZEWORTH	250,0	AA	7 x 4,80	127,6	14,40	349,3	20,120	0,2273	0,2324	0,2784	455
VALERIAN	250,0	A	19 x 2,91	126,4	14,55	349,3	20,740	0,2273	0,2324	0,2784	455
DAISY	266,8	AA	7 x 4,96	135,3	14,88	372,0	21,500	0,2133	0,2181	0,2610	475
LAUREL	266,8	A	19 x 3,01	135,2	15,05	372,0	22,120	0,2133	0,2181	0,2610	475
PEONY	300,0	A	19 x 3,19	151,9	15,95	419,1	24,380	0,1897	0,1945	0,2324	515
TULIP	336,4	A	19 x 3,38	170,5	16,90	470,0	27,370	0,1691	0,1734	0,2076	555
DAFFODIL	350,0	A	19 x 3,45	177,6	17,25	489,0	28,450	0,1626	0,1666	0,1995	565
CANNA	397,5	A,AA	19 x 3,68	202,1	18,40	555,4	31,640	0,1431	0,1473	0,1659	615
GOLDENTUFT	450,0	AA	19 x 3,91	228,1	19,55	682,6	35,110	0,1264	0,1299	0,1560	665
COSMOS	477,0	AA	19 x 4,02	241,2	20,10	666,4	37,200	0,1193	0,1224	0,1467	690
SYRINGA	477,0	A	37 x 2,88	241,0	20,16	666,4	38,670	0,1193	0,1224	0,1467	690
ZINNIA	500,0	AA	19 x 4,12	253,3	20,60	698,6	38,980	0,1138	0,1168	0,1398	715
HYACINTH	500,0	A	37 x 2,95	252,9	20,65	698,6	40,540	0,1138	0,1168	0,1398	715
DAHLIA	556,5	AA	19 x 4,35	282,4	21,75	777,4	43,390	0,1022	0,1089	0,1262	765
MISTLETOE	556,5	A	37 x 3,11	281,1	21,77	777,4	44,250	0,1022	0,1089	0,1262	765
MEADOWSEET	600,0	A,AA	37 x 3,23	303,2	22,61	838,1	47,620	0,09482	0,09820	0,01168	800
ORCHID	636,0	A,AA	37 x 3,33	322,2	23,31	888,4	50,730	0,08947	0,09262	0,11063	835
HEUCHERA	650,0	AA	37 x 3,37	330,0	23,59	908,1	51,840	0,08747	0,09098	0,10853	855
VERBENA	700,0	AA	37 x 3,49	354,0	24,43	977,9	55,630	0,08123	0,08451	0,10069	880
FLAG	700,0	A	61 x 2,72	354,5	24,48	977,9	57,415	0,08123	0,08451	0,10069	880
VIOLET	715,5	AA	37 x 3,53	362,1	24,71	999,6	56,960	0,07953	0,08264	0,09820	900
NASTURTIUM	715,5	A	61 x 2,75	362,3	24,75	999,6	58,300	0,07953	0,08264	0,09820	900
PETUNIA	750,0	AA	37 x 3,62	380,8	25,34	1 047,7	58,300	0,07585	0,07894	0,09446	922
CATTAIL	750,0	A	61 x 2,82	381,0	25,38	1 047,7	60,080	0,07585	0,07894	0,09446	922
ARBUTUS	795,0	AA	37 x 3,72	402,1	26,04	1 110,6	61,860	0,07156	0,07457	0,8888	960
LILAC	795,0	A	61 x 2,90	402,9	26,10	1 110,6	63,650	0,07156	0,07457	0,8888	960
FUCHSIA	800,0	AA	37 x 3,75	408,7	26,25	1 115,2	62,300	0,07116	0,07421	0,08825	960
HELIOTROPE	800,0	A	61 x 2,92	408,5	26,28	1 115,2	64,080	0,07116	0,07421	0,08825	960

Code word	Size (AWG or kcmil)	Class	Composition	Conductor area (mm ²)	Outer diameter (mm)	Linear mass (Kg/km)	Rated strength (kN)	Electrical resist. d.c. 20°C (Ω/km)	Electrical resist. a.c. 25°C (Ω/km)	Electrical resist. a.c. 75°C (Ω/km)	Current carrying capacity A (1)
ANEMONE	874,5	AA	37 x 3,91	444,3	27,37	1 221,8	66,750	0,06506	0,06837	0,08081	1 020
CROCUS	874,5	A	61 x 3,04	442,8	27,36	1 221,8	70,310	0,06506	0,06837	0,08081	1 020
COCKCOMB	900,0	AA	37 x 3,96	455,7	27,72	1 257,4	68,530	0,06332	0,06650	0,07894	1 040
SNAPDRAGON	900,0	A	61 x 3,09	457,4	27,81	1 257,4	70,760	0,06332	0,06650	0,07894	1 040
MAGNOLIA	954,0	AA	37 x 4,08	483,7	28,56	1 332,8	72,980	0,05965	0,06276	0,07457	1 080
GOLDENROD	954,0	A	61 x 3,18	484,5	28,62	1 332,8	72,215	0,05965	0,06276	0,07457	1 080
HAWKWEED	1 000,0	AA	37 x 4,17	505,3	29,19	1 397,0	76,540	0,05689	0,06004	0,07146	1 110
CAMELLIA	1 000,0	A	61 x 3,25	506,0	29,25	1 397,0	78,770	0,05689	0,06004	0,07146	1 110
BLUEBELL	1 033,5	AA	37 x 4,24	522,4	29,68	1 443,8	78,770	0,05505	0,05830	0,06906	1 135
LARKSPUR	1 033,5	A	61 x 3,31	524,9	29,79	1 443,8	81,450	0,05505	0,05830	0,06906	1 135
MARIGOLD	1 113,0	A,AA	61 x 3,43	563,6	30,87	1 555,2	87,670	0,05112	0,05456	0,06437	1 190
HAWTHORN	1 192,5	A,AA	61 x 3,55	603,8	31,95	1 665,3	93,900	0,04770	0,05121	0,06033	1 240
NARCISSUS	1 272,0	A,AA	61 x 3,67	645,3	33,03	1 776,9	97,900	0,04472	0,04816	0,05673	1 290
COLUMBINE	1 351,5	A,AA	61 x 3,78	684,5	34,02	1 888,5	104,130	0,04209	0,04560	0,05377	1 340
CARNATION	1 431,0	A,AA	61 x 3,89	725,0	35,01	1 998,6	108,140	0,03976	0,04344	0,05102	1 390
GLADIOLUS	1 510,0	A,AA	61 x 4,00	766,5	36,00	2 110,3	113,920	0,03766	0,04134	0,04852	1 430
COREOPSIS	1 590,0	AA	61 x 4,10	805,4	36,90	2 222,0	120,150	0,03579	0,03960	0,04636	1 480
JESSAMINE	1 750,0	AA	61 x 4,30	885,8	38,70	2 445,1	132,170	0,03251	0,03642	0,04262	1 565

Note 1 – With the following conditions: Ambient temperature = 25°C; Conductors' temperature = 75°C; Wind velocity = 0,6 m/s. Without solar radiation.

Note 2 – Outer layer stranding direction: Right-hand (Z).

APPLICATION

Conductor for aerial power lines of medium, high and extra high voltage.

CONSTRUCTION CHARACTERISTICS

Conductors are formed by aluminium alloy wires, concentrically stranded in layers.

All wires have the same nominal diameter.

AAAC – “All Aluminium Alloy Conductors”

GENERAL CHARACTERISTICS

The aluminium alloy has a tensile strength capacity higher than AL1 aluminium

Aluminium alloy with a conductivity between 52,5 and 53% IACS

The ratio tensile/weight is higher than standard AAC cables

The resistance to corrosion exceeds that of ACSR cables

ELECTRICAL AND DIMENSIONAL CHARACTERISTICS

CENELEC EN50182:2001 standard

Characteristics of aluminium alloy conductors – Type AL 3 – Spain

Code	Old code	Conductor area (mm ²)	N.º of wires	Wire diameter (mm)	Nominal diameter (mm)	Linear mass (kg/km)	Rated strength (kN)	Electrical resist. d.c. 20°C (Ω/km)
28-AL3	D 28	27,8	7	2,25	6,75	76,0	8,21	1,1817
43-AL3	D 40	43,1	7	2,80	8,40	117,7	12,72	0,7631
55-AL3	D 56	54,6	7	3,15	9,45	148,9	16,096	0,6029
76-AL3	D 80	75,5	19	2,25	11,3	207,4	22,29	0,4378
117-AL3	D 110	117,0	19	2,80	14,0	321,2	34,51	0,2827
148-AL3	D 145	148,1	19	3,15	15,8	406,5	43,68	0,2234
188-AL3	D 180	188,1	19	3,55	17,8	516,3	55,48	0,1759
279-AL3	D 280	279,3	37	3,10	21,7	769,3	82,38	0,1188
381-AL3	D 400	381,0	61	2,82	25,4	1 053,0	112,39	0,0874
454-AL3	D 450	454,5	61	3,08	27,7	1 256,1	134,07	0,0733
547-AL3	D 550	547,3	61	3,38	30,4	1 512,7	161,46	0,0608
638-AL3	D 630	638,3	61	3,65	32,9	1 764,0	188,29	0,0522

Note 1 – Outer layer stranding direction: Right-hand (Z).



CENELEC EN50182:2001 standard

Characteristics of aluminium alloy conductors – Type AL 3 – United Kingdom

Code number	Previous code word	Conductor area (mm ²)	N.º of wires	Wire diameter (mm)	Nominal diameter (mm)	Linear mass (kg/km)	Rated strength (kN)	Electrical resist. d.c. 20°C (Ω/km)
24-AL3	ACACIA	23,8	7	2,08	6,24	64,9	7,02	1,3828
30-AL3	ALMOND	30,1	7	2,34	7,02	82,2	8,88	1,0926
35-AL3	CEDAR	35,5	7	2,54	7,62	96,8	10,46	0,9273
42-AL3	DEODAR	42,2	7	2,77	8,31	115,2	12,44	0,7797
48-AL3	FIR	47,8	7	2,95	8,85	130,6	14,11	0,6875
60-AL3	HAZEL	59,9	7	3,30	9,90	163,4	17,66	0,5494
72-AL3	PINE	71,6	7	3,61	10,8	195,6	21,14	0,4591
84-AL3	HOLLY	84,1	7	3,91	11,7	229,5	24,79	0,3913
90-AL3	WILLOW	89,7	7	4,04	12,1	245,0	26,47	0,3665
119-AL3	OAK	118,9	7	4,65	14,0	324,5	35,07	0,2767
151-AL3	MULBERRY	150,9	19	3,18	15,9	414,3	44,52	0,2192
181-AL3	ASH	180,7	19	3,48	17,4	496,1	53,31	0,1830
211-AL3	ELM	211,0	19	3,76	18,8	579,2	62,24	0,1568
239-AL3	POPLAR	239,4	37	2,87	20,1	659,4	70,61	0,1387
303-AL3	SYCAMORE	303,2	37	3,23	22,6	835,2	89,40	0,1095
362-AL3	UPAS	362,1	37	3,53	24,7	997,5	106,82	0,0917
479-AL3	YEW	479,0	37	4,06	28,4	1 319,6	141,31	0,0693
498-AL3	TOTARA	498,1	37	4,14	29,0	1 372,1	146,93	0,0666
587-AL3	RUBUS	586,9	61	3,50	31,5	1 622,0	173,13	0,0567
659-AL3	SORBUS	659,4	61	3,71	33,4	1 822,5	194,53	0,0505
821-AL3	ARAUCARIA	821,1	61	4,14	37,3	2 269,4	242,24	0,0406
996-AL3	REDWOOD	996,2	61	4,56	41,0	2 753,2	293,88	0,0334

Note 1 – Outer layer stranding direction: Right-hand (Z).

CENELEC EN50182:2001 standard

Characteristics of aluminium alloy conductors features – Type AL 3 – Germany

Code	Old code	Conductor area (mm ²)	N.º of wires	Wire diameter (mm)	Nominal diameter (mm)	Linear mass (Kg/km)	Rated strength (kN)	Electrical resist. c.c 20°C (Ω/km)	Final modulus of elasticity (N/mm ²)	Final coefficient of linear expansion (1/K)	Current carrying capacity A (1)
16-AL3	16	15,9	7	1,70	5,10	43,4	4,69	2,0701	60 000	2,30E-05	105
24-AL3	25	24,2	7	2,10	6,30	66,2	7,15	1,3566	60 000	2,30E-05	135
34-AL3	35	34,4	7	2,50	7,50	93,8	10,14	0,9572	60 000	2,30E-05	170
49-AL3	50	49,5	7	3,00	9,00	135,1	14,60	0,6647	60 000	2,30E-05	210
48-AL3	50	48,3	19	1,80	9,00	132,7	14,26	0,6841	57 000	2,30E-05	210
66-AL3	70	65,8	19	2,10	10,5	180,7	19,41	0,5026	57 000	2,30E-05	255
93-AL3	95	93,3	19	2,50	12,5	256,0	27,51	0,3546	57 000	2,30E-05	320
117-AL3	120	117,0	19	2,80	14,0	321,2	34,51	0,2827	57 000	2,30E-05	365
147-AL3	150	147,1	37	2,25	15,8	405,3	43,40	0,2256	57 000	2,30E-05	425
182-AL3	185	181,6	37	2,50	17,5	500,3	53,58	0,1827	57 000	2,30E-05	490
243-AL3	240	242,5	61	2,25	20,3	670,3	71,55	0,1373	55 000	2,30E-05	585
299-AL3	300	299,4	61	2,50	22,5	827,5	88,33	0,1112	55 000	2,30E-05	670
400-AL3	400	400,1	61	2,89	26,0	1 105,9	118,04	0,0832	55 000	2,30E-05	810
500-AL3	500	499,8	61	3,23	29,1	1 381,4	147,45	0,0666	55 000	2,30E-05	930
626-AL3	625	626,2	91	2,96	32,6	1 737,7	184,73	0,0534	55 000	2,30E-05	1 075
802-AL3	800	802,1	91	3,35	36,9	2 225,8	236,62	0,0417	55 000	2,30E-05	1 255
1000-AL3	1 000	999,7	91	3,74	41,1	2 774,3	294,91	0,0334	55 000	2,30E-05	1 450

Note 1 – (1) Guideline values of current carrying capacity are valid up to a frequency of 60 Hz, assuming a wind velocity of 0,6 m/s, the effect of solar radiation for Germany, an initial ambient temperature of 35° C and a conductor temperature of 80° C. For special applications, when there is no air turbulence, the values should be reduced by 30 %.

Note 2 – Values of final modulus of elasticity and coefficient of linear expansion for the conductor sizes listed in the Table are used in Germany. Values for other conductor constructions may be calculated using the method given in IEC 61597.

Note 3 – Outer layer stranding direction: Right-hand (Z).

CENELEC EN 50182 standard

Characteristics of aluminium alloy conductors – Type AL 4 – France

Code	Previous code	Conductor area	N.° of wires	Wire diameter	Nominal diameter	Linear mass	Rated strength	Electrical resist. d.c. 20°C	Final modulus of elasticity	Final coefficient of linear expansion
	ASTER	(mm²)		(mm)	(mm)	(Kg/km)	(kN)	(Ω/km)	(N/mm²)	(1/K)
22-AL4	22	22,0	7	2,00	6,00	60,0	7,15	1,4989	62 000	2,30E-05
34-AL4	34,4	34,4	7	2,50	7,50	93,8	11,17	0,9593	62 000	2,30E-05
55-AL4	54,6	54,6	7	3,15	9,45	148,9	17,73	0,6042	62 000	2,30E-05
76-AL4	75,5	75,5	19	2,25	11,3	207,4	24,55	0,4388	60 000	2,30E-05
117-AL4	117	117,0	19	2,80	14,0	321,2	38,02	0,2833	60 000	2,30E-05
148-AL4	148	148,1	19	3,15	15,8	406,5	48,12	0,2239	60 000	2,30E-05
182-AL4	181,6	181,6	37	2,50	17,5	500,3	59,03	0,1831	57 000	2,30E-05
228-AL4	228	227,8	37	2,80	19,6	627,6	74,04	0,1460	57 000	2,30E-05
288-AL4	288	288,3	37	3,15	22,1	794,3	93,71	0,1154	57 000	2,30E-05
366-AL4	366	366,2	37	3,55	24,9	1 008,9	115,36	0,0908	57 000	2,30E-05
570-AL4	570	570,2	61	3,45	31,1	1 576,0	185,33	0,0585	54 000	2,30E-05
851-AL4	851	850,7	91	3,45	38,0	2 360,7	276,47	0,0394	52 000	2,30E-05
1144-AL4	1 144	1 143,5	91	4,00	44,0	3 173,4	360,22	0,0293	52 000	2,30E-05
1596-AL4	1 600	1 595,9	127	4,00	52,0	4 427,5	502,72	0,0210	50 500	2,30E-05

Note 1 – Outer layer stranding direction: Left-hand (S).**Note 2** – Values of final modulus of elasticity and coefficient of linear expansion for the conductor sizes listed in the Table are used in France. Values for other conductor constructions may be calculated using the method given in IEC 61597.

ASTM B-399 standard

Characteristics of aluminium alloy conductors – Countries with North American influence

Code word	Conductor size (MCM)	Composition		Outer diam. (mm)	Conductor area (mm ²)	ACSR size of equivalent diameter	E.C. size of equivalent resistance	Linear mass (kg/km)	Rated strength (N)	Electrical resistance (Ω/km)			Current carrying capacity A (1)
		N.º	Ø (mm)							d.c. 20°C	a.c. 25°C	a.c. 75°C	
AKRON	30,58	7	1,68	5,04	15,52	6-6/1	6	42,7	4 920	2,1614	2,1995	2,5754	110
ALTON	48,69	7	2,12	6,36	24,70	4-6/1	4	68,0	7 840	1,3576	1,3816	1,6175	150
AMES	77,47	7	2,67	8,01	39,19	2-6/1	2	108,2	12 500	0,8533	0,8694	1,0171	200
AZUSA	123,3	7	3,37	10,11	62,44	1/0-6/1	1/0	172,2	19 000	0,5364	0,5456	0,6398	270
ANAHEIM	155,4	7	3,78	11,34	78,55	2/0-6/1	2/0	217,1	24 000	0,4255	0,4331	0,5072	315
AMHERST	195,7	7	4,25	12,75	99,30	3/0-6/1	3/0	273,4	30 200	0,3379	0,3445	0,4035	365
ALLIANCE	246,9	7	4,77	14,31	125,09	4/0-6/1	4/0	345,0	38 100	0,2658	0,2740	0,3199	420
BUTTE	312,8	19	3,26	16,30	158,59	266-26/7	266	436,9	46 700	0,2114	0,2156	0,2523	490
CANTON	394,5	19	3,66	18,30	199,89	336-26/7	336	551,1	59 000	0,1675	0,1713	0,2001	570
CAIRO	465,4	19	3,98	19,90	236,38	397-26/7	397	650,2	69 600	0,1421	0,1453	0,1698	640
DARIEN	559,5	19	4,36	21,80	283,67	477-26/7	477	781,6	83 600	0,1181	0,1211	0,1414	720
ELGIN	652,4	19	4,71	23,55	331,04	556-26/7	536	911,4	97 500	0,1013	0,1043	0,1217	790
FLINT	740,8	37	3,59	25,13	374,52	636-26/7	636	1,035	108 000	0,08924	0,09219	0,1073	860
GREELEY	927,2	37	4,02	28,14	469,62	795-26/7	795	1,295	136 000	0,07129	0,07415	0,08629	990

Note 1 – (1) With the following conditions:

Ambient temperature = 25°C;

Conductors' temperature = 75°C;

Wind velocity = 0,6 m/s. No full sun (Without solar radiation).

Note 2 – Outer layer stranding direction: Right-hand (Z).

APPLICATION

Conductor used as power ground wire for protection of aerial power lines of medium, high and extra high voltage. Indicated for aerial lines with long span lengths.

CONSTRUCTION CHARACTERISTICS

Conductors are made of one or several layers of hard drawn aluminium wires stranded in concentric layers around a galvanized steel core. The steel core can be impregnated with protective grease. To bring the cable to specific applications, it is possible to vary the relative proportion of the cross-sectional area of aluminium and steel.

ACSR – "Aluminium Conductor Steel Reinforced"

GENERAL CHARACTERISTICS

Good resistance to corrosion.

Good ratio for strength/weight. Allows the use in long span lengths.



ELECTRICAL AND DIMENSIONAL CHARACTERISTICS

CENELEC EN50182:2001 standard

Characteristics of aluminium conductors steel reinforced – Type AL1 / ST1A – Spain

Code	Old code	Cross-section			Composition				Diameter		Linear mass (kg/km)	Rated strength (kN)	Electrical resist. d.c. 20°C (Ω/km)
		Alum. (mm²)	Steel (mm²)	Total (mm²)	Aluminium		Steel		Steel core (mm)	Conductor (mm)			
					N.º of wires	Diam. (mm)	N.º of wires	Diam. (mm)					
27-AL1/4-ST1A	LA 30	26,7	4,45	31,1	6	2,38	1	2,38	2,38	7,14	107,8	9,74	1,0736
47-AL1/8-ST1A	LA 56	46,8	7,79	54,6	6	3,15	1	3,15	3,15	9,45	188,8	16,29	0,6129
67-AL1/11-ST1A	LA 78	67,3	11,2	78,6	6	3,78	1	3,78	3,78	11,3	271,8	23,12	0,4256
94-AL1/22-ST1A	LA 110	94,2	22,0	116,2	30	2,00	7	2,00	6,00	14,0	432,5	43,17	0,3067
119-AL1/28-ST1A	LA 145	119,3	27,8	147,1	30	2,25	7	2,25	6,75	15,8	547,4	54,03	0,2423
147-AL1/34-ST1A	LA 180	147,3	34,4	181,6	30	2,50	7	2,50	7,50	17,5	675,8	64,94	0,1963
242-AL1/39-ST1A	LA 280 HAWK	241,6	39,5	281,1	26	3,44	7	2,68	8,04	21,8	976,2	84,89	0,1195
337-AL1/44-ST1A	LA 380 GULL	337,3	43,7	381,0	54	2,82	7	2,82	8,46	25,4	1 274,6	107,18	0,0857
402-AL1/52-ST1A	LA 455 CONDOR	402,3	52,2	454,5	54	3,08	7	3,08	9,24	27,7	1 520,5	123,75	0,0719
485-AL1/63-ST1A	LA 545 CARDINAL	484,5	62,8	547,3	54	3,38	7	3,38	10,1	30,4	1 831,1	149,04	0,0597
585-AL1/72-ST1A	LA 635 FINCH	565,0	71,6	636,6	54	3,65	19	2,19	11,0	32,9	2 123,0	174,14	0,0512

Note 1 – Outer layer stranding direction: Right-hand (Z).

CENELEC EN50182:2001 standard

Characteristics of aluminium conductors steel reinforced – Type AL1/ST1A – United Kingdom

Code number	Old code	Cross-section			Composition				Diameter		Linear mass (kg/km)	Rated strength (kN)	Electrical resist. d.c. 20°C (Ω/km)
		Alum. (mm ²)	Steel (mm ²)	Total (mm ²)	Aluminium		Steel		Steel core (mm)	Conductor (mm)			
					N.º of wires	Diam. (mm)	N.º of wires	Diam. (mm)					
11-AL1/2-ST1A	MOLE	10,6	1,77	12,4	6	1,50	1	1,50	1,50	4,50	42,8	4,14	2,7027
21-AL1/3-ST1A	SQUIRREL	21,0	3,50	24,5	6	2,11	1	2,11	2,11	6,33	84,7	7,87	1,3659
26-AL1/4-ST1A	GOPHER	26,2	4,37	30,6	6	2,36	1	2,36	2,36	7,08	106,0	9,58	1,0919
32-AL1/5-ST1A	WEASEL	31,6	5,27	36,9	6	2,59	1	2,59	2,59	7,77	127,6	11,38	0,9065
37-AL1/6-ST1A	FOX	36,7	6,11	42,8	6	2,79	1	2,79	2,79	8,37	148,1	13,21	0,7812
42-AL1/7-ST1A	FERRET	42,4	7,07	49,5	6	3,00	1	3,00	3,00	9,00	171,2	15,27	0,6757
53-AL1/9-ST1A	RABBIT	52,9	8,81	61,7	6	3,35	1	3,35	3,35	10,1	213,5	18,42	0,5419
63-AL1/11-ST1A	MINK	63,1	10,5	73,6	6	3,66	1	3,66	3,66	11,0	254,9	21,67	0,4540
63-AL1/37-ST1A	SKUNK	63,2	36,9	100,1	12	2,59	7	2,59	7,77	13,0	463,0	52,79	0,4568

Code number	Old code	Cross-section			Composition				Diameter		Linear mass (kg/km)	Rated strength (kN)	Electrical resist. d.c. 20°C (Ω/km)
		Alum. (mm ²)	Steel (mm ²)	Total (mm ²)	Aluminium		Steel		Steel core (mm)	Conductor (mm)			
					N.° of wires	Diam. (mm)	N.° of wires	Diam. (mm)					
75-AL1/13-ST1A	BEAVER	75,0	12,5	87,5	6	3,99	1	3,99	3,99	12,0	302,9	25,76	0,3820
73-AL1/43-ST1A	HORSE	73,4	42,8	116,2	12	2,79	7	2,79	8,37	14,0	537,3	61,26	0,3936
79-AL1/13-ST1A	RACCOON	78,8	13,1	92,0	6	4,09	1	4,09	4,09	12,3	318,3	27,06	0,3635
84-AL1/14-ST1A	OTTER	83,9	14,0	97,9	6	4,22	1	4,22	4,22	12,7	338,8	28,81	0,3415
95-AL1/16-ST1A	CAT	95,4	15,9	111,3	6	4,50	1	4,50	4,50	13,5	385,3	32,76	0,3003
105-AL1/17-ST1A	HARE	105,0	17,5	122,5	6	4,72	1	4,72	4,72	14,2	423,8	36,04	0,2730
105-AL1/14-ST1A	DOG	105,0	13,6	118,5	6	4,72	7	1,57	4,71	14,2	394,0	32,65	0,2733
132-AL1/20-ST1A	COYOTE	131,7	20,1	151,8	26	2,54	7	1,91	5,73	15,9	520,7	45,86	0,2192
132-AL1/7-ST1A	COUGAR	131,5	7,31	138,8	18	3,05	1	3,05	3,05	15,3	418,8	29,74	0,2188
131-AL1/31-ST1A	TIGER	131,2	30,6	161,9	30	2,36	7	2,36	7,08	16,5	602,2	57,87	0,2202
158-AL1/37-ST1A	WOLF	158,1	36,9	194,9	30	2,59	7	2,59	7,77	18,1	725,3	68,91	0,1829
159-AL1/9-ST1A	DINGO	158,7	8,81	167,5	18	3,35	1	3,35	3,35	16,8	505,2	35,87	0,1814
183-AL1/43-ST1A	LYNX	183,4	42,8	226,2	30	2,79	7	2,79	8,37	19,5	841,6	79,97	0,1576
184-AL1/10-ST1A	CARACAL	184,2	10,2	194,5	18	3,61	1	3,61	3,61	18,1	586,7	40,74	0,1562
212-AL1/49-ST1A	PANTEHR	212,1	49,5	261,5	30	3,00	7	3,00	9,00	21,0	973,1	92,46	0,1363
211-AL1/12-ST1A	JAGUAR	210,6	11,7	222,3	18	3,86	1	3,86	3,86	19,3	670,8	46,57	0,1366
238-AL1/56-ST1A	LION	238,3	55,6	293,9	30	3,18	7	3,18	9,54	22,3	1093,4	100,47	0,1213
264-AL1/62-ST1A	BEAR	264,4	61,7	326,1	30	3,35	7	3,35	10,1	23,5	1213,4	111,50	0,1093
324-AL1/76-ST1A	GOAT	324,3	75,7	400,0	30	3,71	7	3,71	11,1	26,0	1488,2	135,13	0,0891
375-AL1/88-ST1A	SHEEP	375,1	87,5	462,6	30	3,99	7	3,99	12,0	27,9	1721,3	156,30	0,0771
374-AL1/48-ST1A	ANTELOPE	374,1	48,5	422,6	54	2,97	7	2,97	8,91	26,7	1413,8	118,88	0,0773
382-AL1/49-ST1A	BISON	381,7	49,5	431,2	54	3,00	7	3,00	9,00	27,0	1442,5	121,30	0,0758
430-AL1/100-ST1A	DEER	429,6	100,2	529,8	30	4,27	7	4,27	12,8	29,9	1971,4	179,00	0,0673
429-AL1/56-ST1A	ZEBRA	428,9	55,6	484,5	54	3,18	7	3,18	9,54	28,6	1620,8	131,92	0,0674
477-AL1/111-ST1A	ELK	477,1	111,3	588,5	30	4,50	7	4,50	13,5	31,5	2189,5	198,80	0,0606
476-AL1/62-ST1A	CAMEL	476,0	61,7	537,7	54	3,35	7	3,35	10,1	30,2	1798,8	146,40	0,0608
528-AL1/69-ST1A	MOOSE	528,5	68,5	597,0	54	3,53	7	3,53	10,6	31,8	1997,3	159,92	0,0547

Note 1 – Outer layer stranding direction: Right-hand (Z).

CENELEC EN50182:2001 standard

Characteristics of aluminium conductors steel reinforced – Type AL1/ST1A – Germany

Code number	Old code	Cross-section				N.° of wires			Nominal diameter		Diameter		Linear mass (kg/km)	Rated strength (kN)	Electrical resistance d.c. 20°C (Ω/km)	Final modulus of elasticity (N/mm²)	Final coefficient of thermal expansion (1/K)	Current carrying capacity A (1)
		Alum.		Steel	Total	Alum.	Steel	Core	Cond.									
		(mm²)	(mm²)	(mm²)	(mm)	(mm)	(mm)			(mm)								
15-AL1/3-ST1A	16/2,5	15,3	2,54	17,8	6	1,80	1	1,80	1,80	5,40	61,6	5,80	1,8769	81 000	1,92E-05	105		
24-AL1/4-ST1A	25/4	23,9	3,98	27,8	6	2,25	1	2,25	2,25	6,75	96,3	8,95	1,2012	81 000	1,92E-05	140		
34-AL1/6-ST1A	35/6	34,4	5,73	40,1	6	2,70	1	2,70	2,70	8,10	138,7	12,37	0,8342	81 000	1,92E-05	170		
44-AL1/32-ST1A	44/32	44,0	31,7	75,6	14	2,00	7	2,40	7,20	11,2	369,3	44,24	0,6574	110 000	1,50E-05	—		
48-AL1/8-ST1A	50/8	48,3	8,04	56,3	6	3,20	1	3,20	3,20	9,60	194,8	16,81	0,5939	81 000	1,92E-05	210		
51-AL1/30-ST1A	50/30	51,2	29,8	81,0	12	2,33	7	2,33	6,99	11,7	374,7	42,98	0,5644	107 000	1,53E-05	—		
70-AL1/11-ST1A	70/12	69,9	11,4	81,3	26	1,85	7	1,44	4,32	11,7	282,2	26,27	0,4132	77 000	1,89E-05	290		
94-AL1/15-ST1A	95/15	94,4	15,3	109,7	26	2,15	7	1,67	5,01	13,6	380,6	34,93	0,3060	77 000	1,89E-05	350		
97-AL1/56-ST1A	95/55	96,5	56,3	152,8	12	3,20	7	3,20	9,60	16,0	706,8	77,85	0,2992	107 000	1,53E-05	—		
106-AL1/76-ST1A	105/75	105,7	75,5	181,2	14	3,10	19	2,25	11,3	17,5	885,3	105,82	0,2742	110 000	1,50E-05	—		
122-AL1/20-ST1A	120/20	121,6	19,8	141,4	26	2,44	7	1,90	5,70	15,5	491,0	44,50	0,2376	77 000	1,89E-05	410		
122-AL1/71-ST1A	120/70	122,1	71,3	193,4	12	3,60	7	3,60	10,8	18,0	894,5	97,92	0,2364	107 000	1,53E-05	—		
128-AL1/30-ST1A	125/30	127,9	29,8	157,8	30	2,33	7	2,33	6,99	16,3	587,0	56,41	0,2260	82 000	1,78E-05	425		
149-AL1/24-ST1A	150/25	148,9	24,2	173,1	26	2,70	7	2,10	6,30	17,1	600,8	53,67	0,1940	77 000	1,89E-05	470		
172-AL1/40-ST1A	170/40	171,8	40,1	211,8	30	2,70	7	2,70	8,10	18,9	788,2	74,89	0,1683	82 000	1,78E-05	520		
184-AL1/30-ST1A	185/30	183,8	29,8	213,6	26	3,00	7	2,33	6,99	19,0	741,0	65,27	0,1571	77 000	1,89E-05	535		
209-AL1/34-ST1A	210/35	209,1	34,1	243,2	26	3,20	7	2,49	7,47	20,3	844,1	73,36	0,1381	77 000	1,89E-05	590		
212-AL1/49-ST1A	210/50	212,1	49,5	261,5	30	3,00	7	3,00	9,00	21,0	973,1	92,46	0,1363	82 000	1,78E-05	610		
231-AL1/30-ST1A	230/30	230,9	29,8	260,8	24	3,50	7	2,33	6,99	21,0	870,9	72,13	0,1250	74 000	1,96E-05	630		
243-AL1/39-ST1A	240/40	243,1	39,5	282,5	26	3,45	7	2,68	8,04	21,8	980,1	85,12	0,1188	77 000	1,89E-05	645		
264-AL1/34-ST1A	265/35	263,7	34,1	297,7	24	3,74	7	2,49	7,47	22,4	994,4	81,04	0,1095	74 000	1,96E-05	680		
304-AL1/49-ST1A	300/50	304,3	49,5	353,7	26	3,86	7	3,00	9,00	24,4	1 227,3	105,09	0,0949	77 000	1,89E-05	740		
305-AL1/39-ST1A	305/40	304,6	39,5	344,1	54	2,68	7	2,68	8,04	24,1	1 151,2	96,80	0,0949	70 000	1,93E-05	740		
339-AL1/30-ST1A	340/30	339,3	29,8	369,1	48	3,00	7	2,33	6,99	25,0	1 171,2	91,71	0,0852	62 000	2,05E-05	790		
382-AL1/49-ST1A	380/50	381,7	49,5	431,2	54	3,00	7	3,00	9,00	27,0	1 442,5	121,30	0,0758	70 000	1,93E-05	840		
386-AL1/34-ST1A	385/35	386,0	34,1	420,1	48	3,20	7	2,49	7,47	26,7	1 333,6	102,56	0,0749	62 000	2,05E-05	850		
434-AL1/56-ST1A	435/55	434,3	56,3	490,6	54	3,20	7	3,20	9,60	28,8	1 641,3	133,59	0,0666	70 000	1,93E-05	900		
449-AL1/39-ST1A	450/40	448,7	39,5	488,2	48	3,45	7	2,68	8,04	28,7	1 549,1	119,05	0,0644	62 000	2,05E-05	920		
490-AL1/64-ST1A	490/65	490,3	63,6	553,8	54	3,40	7	3,40	10,2	30,6	1 852,9	150,81	0,0590	70 000	1,93E-05	960		
494-AL1/34-ST1A	495/35	494,4	34,1	528,4	45	3,74	7	2,49	7,47	29,9	1 632,6	117,96	0,0584	61 000	2,09E-05	985		
511-AL1/45-ST1A	510/45	510,5	45,3	555,8	48	3,68	7	2,87	8,61	30,7	1 765,3	133,31	0,0566	62 000	2,05E-05	995		

Code number	Old code	Cross-section			N.° of wires		Nominal diameter		Diameter		Linear mass (kg/km)	Rated strength (kN)	Electrical resistance d.c. 20°C (Ω/km)	Final modulus of elasticity (N/mm²)	Final coefficient of thermal expansion (1/K)	Current carrying capacity A (1)
		Alum. (mm²)	Steel (mm²)	Total (mm²)	Alum.	Steel	Alum. (mm)	Steel (mm)	Core (mm)	Cond. (mm)						
550-AL1/71-ST1A	550/70	549,7	71,3	620,9	54	3,60	7	3,60	10,8	32,4	2 077,2	166,32	0,0526	70 000	1,93E-05	1 020
562-AL1/49-ST1A	560/50	561,7	49,5	611,2	48	3,86	7	3,00	9,00	32,2	1 939,5	146,28	0,0515	62 000	2,05E-05	1 040
571-AL1/39-ST1A	570/40	571,2	39,5	610,6	45	4,02	7	2,68	8,04	32,2	1 887,1	136,40	0,0506	61 000	2,09E-05	1 050
653-AL1/45-ST1A	650/45	653,5	45,3	698,8	45	4,30	7	2,87	8,61	34,4	2 159,9	156,18	0,0442	61 000	2,09E-05	1 120
679-AL1/86-ST1A	680/85	678,6	86,0	764,5	54	4,00	19	2,40	12,0	36,0	2 549,7	206,56	0,0426	68 000	1,94E-05	1 150
1046-AL1/45-ST1A	1 045/45	1 045,6	45,3	1 090,9	72	4,30	7	2,87	8,61	43,0	3 248,2	218,92	0,0277	60 000	2,17E-05	1 580

Note 1 – (1) The indicated ampacity (maximum permissible current) values are valid up to frequencies of 60 Hz, assuming a crosswind of 0,6m/s, the effect of solar radiation in Germany, an ambient temperature of 35°C and a conductor temperature of 80°C. For special applications, where there is no turbulence, the values are reduced by 30%.

Note 2 – Outer layer stranding direction: Right-hand (Z).

Note 3 – Values of final modulus of elasticity and coefficient of linear expansion for the conductor sizes listed in the Table are used in Germany. Values for other conductor constructions may be calculated using the method given in IEC 61597.

CENELEC EN50182:2001 standard

Characteristics of aluminium conductors steel reinforced – Type AL1/ST1A – France

Code number	Old code	Cross-section			Composition				Nominal diameter		Linear mass (kg/km)	Rated strength (kN)	Electrical resistance d.c. 20°C (Ω/km)	Stranding direction
		Alum. (mm²)	Steel (mm²)	Total (mm²)	Aluminium N.° of wires	Steel		Core (mm)	Cond. (mm)					
						Diam. (mm)	N.° of wires (mm)							
28-AL1/9-ST1A	CANNA 37,7	28,3	9,42	37,7	9	2,00	3	2,00	4,30	8,30	151,5	16,26	1,0187	S
38-AL1/22-ST1A	CANNA 59,7	37,7	22,0	59,7	12	2,00	7	2,00	6,00	10,0	276,1	32,70	0,7660	S
48-AL1/28-ST1A	CANNA 75,5	47,7	27,8	75,5	12	2,25	7	2,25	6,75	11,3	349,4	41,15	0,6052	S
59-AL1/34-ST1A	CANNA 93,3	58,9	34,4	93,3	12	2,50	7	2,50	7,50	12,5	431,4	49,48	0,4902	Z
94-AL1/22-ST1A	CANNA 116,2	94,2	22,0	116,2	30	2,00	7	2,00	6,00	14,0	432,5	43,17	0,3067	S
119-AL1/28-ST1A	CANNA 147,1	119,3	27,8	147,1	30	2,25	7	2,25	6,75	15,8	547,4	54,03	0,2423	S
147-AL1/34-ST1A	CANNA 181,6	147,3	34,4	181,6	30	2,50	7	2,50	7,50	17,5	675,8	64,94	0,1963	S
185-AL1/43-ST1A	CANNA 228	184,7	43,1	227,8	30	2,80	7	2,80	8,40	19,6	847,7	80,54	0,1565	S
234-AL1/55-ST1A	CANNA 288	233,8	54,6	288,3	30	3,15	7	3,15	9,45	22,1	1 072,8	98,58	0,1236	S

Note – Values of final modulus of elasticity and coefficient of linear expansion for the conductor sizes listed in the Table are used in France. Values for other conductor constructions may be calculated using the method given in IEC 61597.

CENELEC EN50182:2001 standard

Characteristics of aluminium conductors steel reinforced – Type AL1 / ST6C – France

Code number	Old code	Cross-section			Composition				Nominal diameter		Linear mass (kg/km)	Rated strength (kN)	Electrical resistance d.c. 20°C (Ω/km)	Stranding direction
		Alum. (mm ²)	Steel (mm ²)	Total (mm ²)	Aluminium		Steel		Core	Cond.				
					N° of wires	Diam. (mm)	N° of wires	Diam. (mm)						
94-AL1/22-ST6C	CROCUS 116.2	94.2	22.0	116.2	30	2.00	7	2.00	6.00	14.0	432.5	49.32	0.3067	S
119-AL1/28-ST6C	CROCUS 147.1	119.3	27.8	147.1	30	2.25	7	2.25	6.75	15.8	547.4	61.83	0.2423	S
147-AL1/34-ST6C	CROCUS 181.6	147.3	34.4	181.6	30	2.50	7	2.50	7.50	17.5	675.8	74.22	0.1963	S
185-AL1/43-ST6C	CROCUS 228	184.7	43.1	227.8	30	2.80	7	2.80	8.40	19.6	847.7	92.18	0.1565	S
234-AL1/55-ST6C	CROCUS 288	233.8	54.6	288.3	30	3.15	7	3.15	9.45	22.1	1 072.8	113.86	0.1236	S
222-AL1/76-ST6C	CROCUS 297	221.7	75.5	297.2	36	2.80	19	2.25	11.3	22.5	1 206.8	147.22	0.1307	Z
326-AL1/86-ST6C	CROCUS 412	325.7	86.0	411.7	32	3.60	19	2.40	12.0	26.4	1 576.1	173.31	0.0889	Z
508-AL1/105-ST6C	CROCUS 612	507.8	104.8	612.6	66	3.13	19	2.65	13.3	32.0	2 226.5	231.55	0.0570	S
717-AL1/148-ST6C	CROCUS 865	717.3	148.1	865.4	66	3.72	19	3.15	15.8	38.1	3 145.4	319.11	0.0403	S
957-AL1/228-ST6C	CROCUS 1 185	956.7	227.8	1 184.5	54	2.80	37	2.80	19.6	44.7	4 433.6	480.75	0.0302	S

Note – Values of final modulus of elasticity and coefficient of linear expansion for the conductor sizes listed in the Table are used in France. Values for other conductor constructions may be calculated using the method given in IEC 61597.

ASTM B-232 standard

Characteristics of aluminium conductors steel reinforced

Code or word	Size (AWG or kcmil)	Composition		Cross-section		Outer diameter		Cable weight			Rated strength (N)	Electrical resistance (Ω/km)			Current carrying capacity A (1)
		Alum. (mm)	Steel (mm)	Total (mm ²)	Alum. (mm ²)	Total (mm)	Núcleo (mm)	Total Kg/Km	Alum. kg/km	Steel kg/km		d.c. 20°C	a.c. 25°C	a.c. 75°C	
TURKEY	6	6 x 1.68	1 x 1.68	15.52	13.30	5.04	1.68	53.8	36.5	17.3	5 295	2.1135	2.1496	2.6850	110
SWAN	4	6 x 2.12	1 x 2.12	24.71	21.18	6.36	2.12	85.4	58.0	27.4	8 280	1.3278	1.3537	1.7172	145
SWANATE	4	7 x 1.96	1 x 2.61	26.47	21.12	6.53	2.61	99.7	58.0	41.7	10 500	1.3133	1.3387	1.7383	145
SPARROW	2	6 x 2.67	1 x 2.67	39.20	33.60	8.01	2.67	135.9	92.3	43.6	12 680	0.8343	0.8527	1.1081	195
SPARATE	2	7 x 2.47	1 x 3.30	42.09	33.54	5.24	3.30	158.8	92.3	66.5	16 200	0.8251	0.8435	1.1181	195
ROBIN	1	6 x 3.00	1 x 3.00	49.48	42.41	9.00	3.00	171.4	116.4	55.0	15 800	0.6621	0.6768	0.8907	200
RAVEN	1/0	6 x 3.37	1 x 3.37	62.44	53.52	10.11	3.37	216.1	146.7	69.4	19 490	0.5243	0.5370	0.7165	255
QUAIL	2/0	6 x 3.78	1 x 3.78	78.55	67.33	11.34	3.78	272.5	185.0	87.5	23 630	0.4160	0.4265	0.5803	295
PIGEON	3/0	6 x 4.25	1 x 4.25	99.31	85.12	12.75	4.25	343.5	233.2	110.3	29 460	0.3304	0.3386	0.4705	340
PENGUIN	4/0	6 x 4.77	1 x 4.77	125.09	107.22	14.31	4.77	433.2	294.2	139.0	37 160	0.2618	0.2697	0.3829	390
WAXWING	266.8	18 x 3.09	1 x 3.09	142.5	135.0	15.45	3.09	431.6	372.9	58.7	30 620	0.2119	0.2169	0.2595	480
PARTRIDGE	266.8	26 x 2.57	7 x 2.00	156.9	134.9	16.28	6.00	546.1	374.3	171.8	50 280	0.2100	0.2146	0.2569	490

Code	Size (AWG or kcmil)	Composition		Cross-section		Outer diameter		Cable weight			Rated strength	Electrical resistance (Ω/km)			Current carrying capacity A (1)
		Alum. (mm)	Steel (mm)	Total (mm ²)	Alum. (mm ²)	Total (mm)	Núcleo (mm)	Total Kg/Km	Alum. kg/km	Steel kg/km		d.c. 20°C	a.c. 25°C	a.c. 75°C	
OSTRICH	300,0	26 x 2,73	7 x 2,12	176,9	152,2	17,28	6,36	614,6	421,3	193,3	56 520	0,1867	0,1909	0,2283	530
MERLIN	336,4	18 x 3,47	1 x 3,47	179,7	170,2	17,35	3,47	543,2	469,7	73,5	38 630	0,1680	0,1719	0,2057	560
LINNET	336,4	26 x 2,89	7 x 2,25	198,4	170,6	18,31	6,75	689,0	472,2	216,8	62 750	0,1663	0,1699	0,2037	570
ORIOLE	336,4	30 x 2,69	7 x 2,69	210,3	170,5	18,83	8,07	784,3	473,2	311,1	76 980	0,1654	0,1690	0,2024	575
CHICKADEE	397,5	18 x 3,77	1 x 3,77	212,1	200,9	18,85	3,77	642,9	555,5	87,4	44 230	0,1421	0,1457	0,1742	620
BRANT	397,5	24 x 3,27	7 x 2,18	227,7	201,6	19,62	6,54	762,0	558,1	203,9	64 970	0,1417	0,1450	0,1732	630
IBIS	397,5	26 x 3,14	7 x 2,44	234,0	201,3	19,88	7,32	814,0	558,2	255,8	72 530	0,1411	0,1444	0,1726	635
LARK	397,5	30 x 2,92	7 x 2,92	247,8	200,9	20,44	8,76	927,1	555,1	372,0	90 330	0,1401	0,1434	0,1726	645
PELICAN	477,0	18 x 4,14	1 x 4,14	255,8	242,3	20,70	4,14	770,9	666,4	104,5	52 510	0,1184	0,1217	0,1453	700
FLICKER	477,0	24 x 3,58	7 x 2,39	273,0	241,6	21,49	7,17	915,2	670,1	245,1	76 540	0,1178	0,1207	0,1444	710
HAWK	477,0	26 x 3,44	7 x 2,67	280,8	241,6	21,77	8,01	977,7	669,7	308,0	86 770	0,1171	0,1201	0,1437	715
HEN	477,0	30 x 3,20	7 x 3,20	297,6	241,3	22,40	9,60	1 111,7	671,0	440,7	105 910	0,1165	0,1194	0,1427	725
OSPREY	556,5	18 x 4,47	1 x 4,47	298,2	282,5	22,35	4,47	898,9	777,0	121,9	60 960	0,1014	0,1043	0,1247	775
PARAKEE	556,5	24 x 3,87	7 x 2,58	318,9	282,3	23,22	7,74	1 067,0	781,6	285,4	88 110	0,1010	0,1037	0,1240	785
DOVE	556,5	26 x 3,72	7 x 2,89	328,5	282,6	23,55	8,67	1 140,0	781,3	358,7	105 570	0,1007	0,1033	0,1237	790
EAGLE	556,5	30 x 3,46	7 x 3,46	347,9	282,1	24,27	10,38	1 297,7	783,2	514,5	123 710	0,1001	0,1027	0,1227	800
PEACOCK	605,0	24 x 4,03	7 x 2,69	345,9	306,1	24,19	8,07	1 160,8	849,8	311,0	96 120	0,9285	0,09547	0,11417	830
SQUAB	605,0	26 x 3,87	7 x 3,01	355,6	305,8	24,51	9,03	1 239,7	849,8	389,9	108 130	0,09252	0,09514	0,11352	835
WOODDUCK	605,0	30 x 3,61	7 x 3,61	378,7	307,1	25,27	10,83	1 410,8	851,2	559,6	128 600	0,03186	0,09449	0,11286	845
TEAL	605,0	30 x 3,61	19 x 2,16	376,7	307,1	25,24	10,80	1 398,9	851,5	547,4	135 500	0,09186	0,09449	0,11286	845
KINGBIRD	636,0	18 x 4,78	1 x 4,78	340,9	323,0	23,90	4,78	1 026,9	887,4	139,5	69 860	0,08891	0,09219	0,10925	840
ROOK	636,0	24 x 4,14	7 x 2,76	365,0	323,1	24,84	8,28	1 220	892,9	327	97 900	0,08825	0,09088	0,10827	855
GROSBEAK	636,0	26 x 3,97	7 x 3,09	374,3	321,8	25,15	9,27	1 302,2	892,6	409,6	112 140	0,08793	0,09055	0,10794	860
SCOTER	636,0	30 x 3,70	7 x 3,70	397,9	322,6	25,90	11,10	1 477,8	891,4	586,4	135 270	0,08760	0,08990	0,10761	870
EGRET	636,0	30 x 3,70	19 x 2,22	396,1	322,6	25,90	11,10	1 470,3	891,4	575,3	140 170	0,08760	0,08990	0,10761	870
SWIFT	636,0	36 x 3,38	1 x 3,38	332,0	232,0	23,66	3,58	958,4	888,4	70,0	61 410	0,08924	0,09186	0,10925	845

Note 1 – (1) With the following conditions: Ambient temperature = 25°C;

Conductors' temperature = 75°C; Wind velocity = 0,6 m/s. Without solar radiation.

Note 2 – Outer layer stranding direction: Right-hand (Z).

ASTM B-232 standard
Characteristics of aluminium conductors steel reinforced

Code word	Size (AWG or kcmil)	Composition		Cross-section		Outer diameter		Cable weight			Rated strength (N)	Electrical resistance (Ω/km)			Current carrying capacity A (I)
		Alum. (mm)	Steel (mm)	Total (mm ²)	Alum. (mm ²)	Total (mm)	Núcleo (mm)	Total Kg/Km	Alum. kg/km	Steel kg/km		d.c. 20°C	a.c. 25°C	a.c. 75°C	
FLAMINGO	666,6	24 x 4,23	7 x 2,82	381,0	337,3	25,38	8,46	1 276,9	935,2	341,7	105 460	0,08432	0,08563	0,10367	880
GANNET	666,6	26 x 4,07	7 x 3,16	393,2	338,3	25,76	9,48	1 364,7	936,1	428,6	117 480	0,08399	0,08497	0,10302	885
STILT	715,5	24 x 4,39	7 x 2,92	410,2	363,3	26,32	8,76	1 372,1	1 004,5	367,6	113 470	0,07841	0,08104	0,09678	920
STARLING	715,5	26 x 4,21	7 x 3,28	421,0	361,9	26,68	9,84	1 465,9	1 004,5	461,4	128 370	0,07808	0,080038	0,08613	930
REDWING	715,5	30 x 3,92	19 x 2,35	444,5	362,1	27,43	11,75	1 653,4	1 007,1	646,3	153 960	0,07776	0,08005	0,09547	940
CUCKOO	795,0	24 x 4,62	7 x 3,08	454,5	402,3	27,72	9,24	1 522,4	1 115,2	407,2	124 150	0,07087	0,07316	0,08727	985
DRAKE	795,0	26 x 4,44	7 x 3,45	468,0	402,6	28,11	10,35	1 628,1	1 115,8	512,3	140 170	0,07054	0,07283	0,08694	995
COOT	795,0	36 x 3,77	1 x 3,77	413,1	401,9	26,39	3,77	1 198,0	1 110,2	87,8	74 760	0,07152	0,07415	0,08825	975
TERN	795,0	45 x 3,38	7 x 2,25	431,6	403,8	27,03	6,75	1 333,4	1 116,1	217,3	98 340	0,07119	0,07382	0,08793	970
CONDOR	795,0	54 x 3,08	7 x 3,08	454,5	402,3	27,72	9,24	1 523,9	1 116,1	407,8	125 480	0,07054	0,07283	0,08694	975
MALLARD	795,0	30 x 4,14	19 x 2,48	495,6	403,8	28,96	12,40	1 637,9	1 118,7	719,2	170 870	0,06988	0,07218	0,08596	1 005
RUDDY	900,0	45 x 3,59	7 x 2,40	487,2	455,5	28,74	7,20	1 510,5	1 263,5	247,0	108 580	0,06234	0,06463	0,07743	1 050
CANARY	900,0	54 x 3,28	7 x 3,28	515,4	456,3	29,52	9,84	1 724,8	1 263,5	461,3	141 950	0,06234	0,06463	0,07710	1 055
CATBIRD	954,0	36 x 4,14	1 x 4,14	498,1	484,6	28,98	4,14	1 437,6	1 333,4	104,2	88 110	0,05971	0,06234	0,07415	1 095
RAIL	954,0	45 x 3,70	7 x 2,47	517,3	483,8	29,61	7,41	1 599,8	1 339,4	260,4	115 250	0,05938	0,06201	0,07382	1 090
CARDINAL	654,0	54 x 3,38	7 x 3,38	547,3	484,5	30,42	10,14	1 829,0	1 339,8	489,2	150 400	0,05906	0,06135	0,07316	1 095
TANAGER	1033,5	36 x 4,30	1 x 4,30	537,3	522,8	30,10	4,30	1 556,6	1 443,5	113,1	92 230	0,05577	0,05873	0,06923	1 130
ORTOLAN	1033,5	45 x 3,85	7 x 2,57	560,2	523,9	30,81	7,71	1 733,7	1 451,0	282,7	123 260	0,05479	0,05741	0,06824	1 150
CURLEW	1033,5	54 x 3,52	7 x 3,52	593,6	525,5	31,68	10,56	1 980,8	1 451,0	529,8	162 860	0,05446	0,05677	0,06759	1 150
BLUEJAY	1113,0	45 x 4,00	7 x 2,66	604,4	565,5	31,98	7,98	1 867,7	1 562,6	305,1	132 600	0,05085	0,05348	0,06365	1 205
FINCH	1113,0	54 x 3,65	19 x 2,19	636,6	565,0	32,85	10,95	2 129,6	1 570,0	559,6	174 000	0,05085	0,05315	0,06332	1 205
BUNTING	1192,5	45 x 4,14	7 x 2,76	647,7	605,8	33,12	8,28	2 000,1	1 674,2	325,9	142 400	0,04757	0,05020	0,05938	1 255
GRACKLE	1192,5	54 x 3,77	19 x 2,27	679,7	602,8	33,97	11,35	2 281,4	1 681,7	599,8	186 450	0,04724	0,04954	0,05906	1 260
SKYLARK	1272,0	36 x 4,78	1 x 4,78	664,0	646,0	33,46	4,78	1 916,8	1 776,9	139,9	117 480	0,04462	0,04757	0,05643	1 310
BITTERN	1272,0	45 x 4,27	7 x 2,85	689,1	644,4	34,17	8,55	2 134,1	1 785,8	348,3	151 740	0,04462	0,04724	0,05610	1 310
PHEASANT	1272,0	54 x 3,90	19 x 2,34	726,8	645,1	35,10	11,70	2 433,2	1 794,2	639,0	194 000	0,04429	0,04659	0,05545	1 310

Code word	Size (AWG or kcmil)	Composition		Cross-section		Outer diameter		Cable weight			Rated strength (N)	Electrical resistance (Ω/km)			Current carrying capacity A (I)
		Alum. (mm)	Steel (mm)	Total (mm²)	Alum. (mm²)	Total (mm)	Núcleo (mm)	Total Kg/Km	Alum. kg/km	Steel kg/km		d.c. 20°C	a.c. 25°C	a.c. 75°C	
DIPPER	1351,5	45 x 4,40	7 x 2,93	731,4	684,2	35,19	8,79	2 266,5	1 898,5	368,0	161 080	0,04199	0,04495	0,05282	1 360
MARTIN	1351,5	54 x 4,02	19 x 2,41	772,1	685,4	36,17	12,05	2 585,0	1 906,4	678,6	206 030	0,04167	0,04396	0,05217	1 365
BOBOLINK	1431,0	45 x 4,53	7 x 3,02	775,4	725,3	36,24	9,06	2 400,4	2 009,1	391,3	170 430	0,03970	0,04265	0,05020	1 410
PLOVER	1431,0	54 x 4,14	19 x 2,48	818,7	726,9	37,24	12,40	2 738,3	2 019,0	719,3	218 480	0,03937	0,04167	0,04954	1 415
NUTHATCH	1510,5	45 x 4,65	7 x 3,10	817,0	764,2	37,20	9,30	2 532,9	2 120,7	412,2	178 440	0,03740	0,04035	0,04757	1 455
PARROT	1510,5	54 x 4,25	19 x 2,55	863,1	766,1	38,25	12,75	2 890,1	2 131,1	759,0	230 050	0,03740	0,04003	0,04724	1 460
LAPWING	1590,0	45 x 4,78	7 x 3,18	863,1	807,5	38,22	9,54	2 666,8	2 232,3	434,5	187 780	0,03576	0,03871	0,04560	1 505
FALCON	1590,0	54 x 4,36	19 x 2,62	908,6	806,2	39,26	13,10	3 041,9	2 242,7	799,2	242 510	0,03543	0,03806	0,04495	1 510

Note 1 – (1) With the following conditions:

Ambient temperature = 25 °C;

Conductors' temperature = 75 °C;

Wind velocity = 0,6 m/s. Without solar radiation.

Note 2 – Outer layer stranding direction: Right-hand (Z).

APPLICATION

Conductor used as power ground wire for protection of aerial power lines of medium, high and extra high voltage. Indicated for aerial lines with long span lengths.

CONSTRUCTION CHARACTERISTICS

Conductors are made of one or several layers of aluminium alloy wires stranded in concentric layers around a galvanized steel core. The steel core can be impregnated with a protective grease.

AACSR – “Aluminium Alloy Conductor Steel Reinforced”

GENERAL CHARACTERISTICS

Good resistance to corrosion

The ratio strength/weight is higher than standard ACSR cables

Ideal for extra-long spans with heavy load and for river crossings



ELECTRICAL AND DIMENSIONAL CHARACTERISTICS

CENELEC EN50182 standard

Characteristics of aluminium alloy conductors with galvanized steel core – Type AL3 / ST1A – Spain

Code number	Old code	Cross-section			N.º of wires		Nominal diameter		Diameter		Linear mass (kg/km)	Rated strength (kN)	Electrical resistance d.c. 20°C (Ω/km)
		Alum. (mm²)	Steel (mm²)	Total (mm²)	Alum.	Steel	Alum. (mm)	Steel (mm)	Core (mm)	Cond. (mm)			
27-AL3/4-ST1A	DA 30	26,7	4,45	31,1	6	1	2,38	2,38	2,38	7,14	107,7	12,95	1,2356
47-AL3/8-ST1A	DA 56	46,8	7,79	54,6	6	1	3,15	3,15	3,15	9,45	188,6	22,37	0,7054
67-AL3/11-ST1A	DA 78	67,3	11,2	78,6	6	1	3,78	3,78	3,78	11,3	271,6	32,21	0,4898
94-AL3/22-ST1A	DA 110	94,2	22,0	116,2	30	7	2,00	2,00	6,00	14,0	432,2	53,53	0,3530
119-AL3/28-ST1A	DA 145	119,3	27,8	147,1	30	7	2,25	2,25	6,75	15,8	547,0	67,75	0,2789
147-AL3/34-ST1A	DA 180	147,3	34,4	181,6	30	7	2,50	2,50	7,50	17,5	675,3	82,61	0,2259
226-AL3/53-ST1A	DA 280	226,4	52,8	279,3	30	7	3,10	3,10	9,30	21,7	1 038,4	124,91	0,1469

Note 1 – Outer layer stranding direction: Right-hand (Z).

CENELEC EN50182 standard

Characteristics of aluminium alloy conductors with galvanized steel core – Type AL3 / ST1A – Germany

Code number	Old code	Cross-section			N.º of wires		Nominal diameter		Diameter		Linear mass (kg/km)	Rated strength (kN)	Electrical resistance d.c. 20°C (Ω/km)	Final modulus of elasticity (N/mm²)	Final coefficient of thermal expansion (1/K)	Current carrying capacity A (1)
		Alum. (mm²)	Steel (mm²)	Total (mm²)	Alum.	Steel	Alum. (mm)	Steel (mm)	Core (mm)	Cond. (mm)						
15-AL3/3-ST1A	16/2,5	15,3	2,54	17,8	6	1	1,80	1,80	1,80	5,40	61,6	7,48	2,1602	81 000	1,92E-05	100
24-AL3/4-ST1A	25/4	23,9	3,98	27,8	6	1	2,25	2,25	2,25	6,75	96,2	11,69	1,3825	81 000	1,92E-05	135
34-AL3/6-ST1A	35/6	34,4	5,73	40,1	6	1	2,70	2,70	2,70	8,10	138,6	16,66	0,9601	81 000	1,92E-05	165
44-AL3/32-ST1A	44/32	44,0	31,7	75,6	14	7	2,00	2,40	7,20	11,2	369,1	49,08	0,7566	110 000	1,50E-05	—
48-AL3/8-ST1A	50/8	48,3	8,04	56,3	6	1	3,20	3,20	3,20	9,60	194,7	23,08	0,6835	81 000	1,92E-05	200
51-AL3/30-ST1A	50/30	51,2	29,8	81,0	12	7	2,33	2,33	6,99	11,7	374,6	49,12	0,6496	107 000	1,53E-05	—
70-AL3/11-ST1A	70/12	69,9	11,4	81,3	26	7	1,85	1,44	4,32	11,7	282,0	33,96	0,4756	77 000	1,89E-05	270
94-AL3/15-ST1A	95/15	94,4	15,3	109,7	26	7	2,15	1,67	5,01	13,6	380,3	45,79	0,3521	77 000	1,89E-05	330
97-AL3/56-ST1A	95/55	96,5	56,3	152,8	12	7	3,20	3,20	9,60	16,0	706,5	90,40	0,3444	107 000	1,53E-05	—
106-AL3/76-ST1A	105/75	105,7	75,5	181,2	14	19	3,10	2,25	11,3	17,5	885,0	119,56	0,3155	110 000	1,50E-05	—

Code number	Old code	Cross-section			N.° of wires		Nominal diameter		Diameter			Linear mass (kg/km)	Rated strength (kN)	Electrical resistance d.c. 20°C (Ω/km)	Final modulus of elasticity (N/mm²)	Final coefficient of thermal expansion (1/K)	Current carrying capacity A (1)
		Alum. (mm²)	Steel (mm²)	Total (mm²)	Alum.	Steel	Diameter										
							(mm)	(mm)	Core (mm)	Cond. (mm)							
122-AL3/20-ST1A	120/20	121,6	19,8	141,4	26	7	2,44	1,90	5,70	15,5	490,6	59,09	0,2734	77 000	1,89E-05	385	
122-AL3/71-ST1A	120/70	122,1	71,3	193,4	12	7	3,60	3,60	10,8	18,0	894,2	114,41	0,2721	107 000	1,53E-05	—	
128-AL3/30-ST1A	125/30	127,9	29,8	157,8	30	7	2,33	2,33	6,99	16,3	586,6	71,76	0,2601	82 000	1,78E-05	400	
149-AL3/24-ST1A	150/25	148,9	24,2	173,1	26	7	2,70	2,10	6,30	17,1	600,3	72,28	0,2233	77 000	1,89E-05	445	
172-AL3/40-ST1A	170/40	171,8	40,1	211,8	30	7	2,70	2,70	8,10	18,9	787,7	96,36	0,1937	82 000	1,78E-05	490	
184-AL3/30-ST1A	185/30	183,8	29,8	213,6	26	7	3,00	2,33	6,99	19,0	740,4	88,24	0,1809	77 000	1,89E-05	505	
209-AL3/34-ST1A	210/35	209,1	34,1	243,2	26	7	3,20	2,49	7,47	20,3	843,5	100,54	0,1590	77 000	1,89E-05	555	
212-AL3/49-ST1A	210/50	212,1	49,5	261,5	30	7	3,00	3,00	9,00	21,0	972,5	118,96	0,1569	82 000	1,78E-05	575	
231-AL3/30-ST1A	230/30	230,9	29,8	260,8	24	7	3,50	2,33	6,99	21,0	870,1	102,14	0,1439	74 000	1,96E-05	595	
243-AL3/39-ST1A	240/40	243,1	39,5	282,5	26	7	3,45	2,68	8,04	21,8	979,4	116,72	0,1368	77 000	1,89E-05	605	
264-AL3/34-ST1A	265/35	263,7	34,1	297,7	24	7	3,74	2,49	7,47	22,4	993,6	116,64	0,1260	74 000	1,96E-05	640	
304-AL3/49-ST1A	300/50	304,3	49,5	353,7	26	7	3,86	3,00	9,00	24,4	1 226,4	146,16	0,1092	77 000	1,89E-05	700	
305-AL3/39-ST1A	305/40	304,6	38,5	344,1	54	7	2,68	2,68	8,04	24,1	1 150,3	134,88	0,1093	70 000	1,93E-05	700	
339-AL3/30-ST1A	340/30	339,3	29,8	369,1	48	7	3,00	2,33	6,99	25,0	1 170,2	134,12	0,0980	62 000	2,05E-05	740	
382-AL3/49-ST1A	380/50	381,7	49,5	431,2	54	7	3,00	3,00	9,00	27,0	1 441,4	169,01	0,0872	70 000	1,93E-05	790	
386-AL3/34-ST1A	385/35	386,0	34,1	420,1	48	7	3,20	2,49	7,47	26,7	1 332,4	152,74	0,0862	62 000	2,05E-05	800	
434-AL3/56-ST1A	435/55	434,3	56,3	490,6	54	7	3,20	3,20	9,60	28,8	1 640,0	190,04	0,0766	70 000	1,93E-05	845	
449-AL3/39-ST1A	450/40	448,7	39,5	488,2	48	7	3,45	2,68	8,04	28,7	1 547,7	177,39	0,0741	62 000	2,05E-05	865	
490-AL3/64-ST1A	490/65	490,3	63,6	553,8	54	7	3,40	3,40	10,2	30,6	1 851,4	215,54	0,0679	70 000	1,93E-05	905	
550-AL3/71-ST1A	550/70	549,7	71,3	620,9	54	7	3,60	3,60	10,8	32,4	2 075,6	240,52	0,0605	70 000	1,93E-05	960	
562-AL3/49-ST1A	560/50	561,7	49,5	611,2	48	7	3,86	3,00	9,00	32,2	1 937,8	222,11	0,0592	62 000	2,05E-05	980	
679-AL3/86-ST1A	680/85	678,6	86,0	764,5	54	19	4,00	2,40	12,0	36,0	2 547,6	298,17	0,0490	68 000	1,94E-05	1 080	

Note 1 – (1) Guideline values of current carrying capacity are valid up to a frequency of 60 Hz, assuming a wind velocity of 0,6 m/s, the effect of solar radiation for Germany, an initial ambient temperature of 35° C and a conductor temperature of 80° C. For special applications, when there is no air turbulence, the values should be reduced by 30 %.

Note 2 – Values of final modulus of elasticity and coefficient of linear expansion for the conductor sizes listed in the Table are used in Germany. Values for other conductor constructions may be calculated using the method given in IEC 61597.

Note 3 – Outer layer stranding direction: Right-hand (Z).

CENELEC EN50182 standard

Characteristics of aluminium alloy conductors with galvanized steel core - Type AL4 / ST6C – France

Code number	Old code	Cross-section			N.° of wires		Nominal diam.		Diameter		Linear mass (kg/km)	Rated strength (kN)	Electrical resistance d.c. 20°C (Ω/km)	Final modulus of elasticity (N/mm ²)	Final coefficient thermal expansion (1/K)	Stranding direction
		Alum. (mm ²)	Steel (mm ²)	Total (mm ²)	Alum.	Steel	Alum. (mm)	Steel (mm)	Steel core (mm)	Cond. (mm)						
28-AL4/9-ST6C	PHLOX 37,7	28,3	9,4	37,7	9	3	2,00	2,00	4,30	8,30	151,4	22,86	1,1750	93 000	1,70E-05	Z
38-AL4/22-ST6C	PHLOX 59,7	37,7	22,0	59,7	12	7	2,00	2,00	6,00	10,0	276,0	44,14	0,8835	108 000	1,53E-05	S
48-AL4/28ST6C	PHLOX 75,5	47,7	27,8	75,5	12	7	2,25	2,25	6,75	11,3	349,3	55,86	0,6981	108 000	1,53E-05	S
52-AL4/42ST6C	PHLOX 94,1	52,0	42,1	94,1	15	19	2,10	1,68	8,40	12,6	474,2	77,96	0,6435	112 000	1,47E-05	S
57-AL4/60-ST6C	PHLOX 116,2	56,5	59,7	116,2	18	19	2,00	2,00	10,0	14,0	625,0	104,93	0,5921	124 000	1,42E-05	S
72-AL4/76-ST6C	PHLOX 147,1	71,6	75,5	147,1	18	19	2,25	2,25	11,3	15,8	791,0	132,80	0,4678	124 000	1,42E-05	S
119-AL4/-28ST6C	PHLOX 147,1	119,3	27,8	147,1	30	7	2,25	2,25	6,75	15,8	547,0	79,12	0,2795	84 000	1,81E-05	S
88-AL4/93-ST6C	PHLOX 181,6	88,4	93,3	181,6	18	19	2,50	2,50	12,5	17,5	976,6	160,22	0,3789	124 000	1,42E-05	S
147-AL4/34-ST6C	PHLOX 181,6	147,3	34,4	181,6	30	7	2,50	2,50	7,50	17,5	675,3	96,31	0,2264	84 000	1,81E-05	S
111-AL4/117-ST6C	PHLOX 228	110,8	117,0	227,8	18	19	2,80	2,80	14,0	19,6	1 225,0	200,98	0,3021	124 000	1,42E-05	S
185-AL4/43-ST6C	PHLOX 228	184,7	43,1	227,8	30	7	2,80	2,80	8,40	19,6	847,1	120,81	0,1805	84 000	1,81E-05	S
140-AL4/148-ST6C	PHLOX 288	140,3	148,1	288,3	18	19	3,15	3,15	15,8	22,1	1 550,4	249,93	0,2387	124 000	1,42E-05	S
234-AL4/55-ST6C	PHLOX 288	233,8	54,6	288,3	30	7	3,15	3,15	9,45	22,1	1 072,1	151,26	0,1426	84 000	1,80E-05	S
206-AL4/93-ST6C	PHLOX 299	206,2	93,3	299,4	42	19	2,50	2,50	12,5	22,5	1 302,8	198,51	0,1622	96 500	1,63E-05	S
148-AL4/228-ST6C	PHLOX 376	147,8	227,8	375,6	24	37	2,80	2,80	19,6	25,2	2 202,4	369,27	0,2270	130 000	1,35E-05	S
326-AL4/86-ST6C	PHLOX 412	325,7	86,0	411,7	32	19	3,60	2,40	12,0	26,4	1 575,1	223,80	0,1025	82 000	1,78E-05	S
508-AL4/105-ST6C	PHLOX 612	507,8	104,8	612,6	66	19	3,13	2,65	13,3	32,0	2 225,0	312,81	0,0657	77 500	1,86E-05	S
717-AL4/148-ST6C	PHLOX 865	717,3	148,1	865,4	66	19	3,72	3,15	15,8	38,1	3 143,2	430,29	0,0465	77 500	1,85E-05	S
957-AL4/228-ST6C	Polygonum 1 185	956,7	227,8	1 184	54	37	2,80	2,80	19,6	42,0	4 430,7	632,15	0,0349	77 500	1,81E-05	S

Note 1 – Values of final modulus of elasticity and coefficient of linear expansion for the conductor sizes listed in the Table are used in France. Values for other conductor constructions may be calculated using the method given in IEC 61597.

APPLICATION

Power ground wire for protection of aerial power lines of medium, high and extra high voltage.
Specially recommended for coastal areas (atmosphere with high levels of salinity).

CONSTRUCTION CHARACTERISTICS

Conductors are made of one or several layers of aluminium wires stranded in concentric layers around aluminium clad steel wires of the reinforcing core.

ACSR/AW – Aluminium Conductor Steel Reinforced (Alumoweld).

GENERAL CHARACTERISTICS

Resistance to corrosion higher than ACSR and AACSR cables

Good ratio for strength/weight, allowing the use in long span lengths



ELECTRICAL AND DIMENSIONAL CHARACTERISTICS

CENELEC EN50182:2001 standard

Characteristics of Aluminium conductors aluminium clad Steel reinforced (LARL) – Spain

Old code	Cross-section		CU equiv.	Outer diameter		Composition		Rated strength	Electrical resistance d.c. 20°C	Linear mass kg/km			Final modulus of elasticity N/mm ²	Coefficient dilatation x10 ⁻⁶ °C
	Alum. (mm ²)	ARL ACS (t)		Core	Total	Aluminium N.º	ARL Diam. N.º			Alum. (mm ²)	ARL (kg/km)	Total (kg/km)		
LARL 30	26,7	4,4	31,1	17,5	7,14	6	2,38	1	2,38	73,2	29,3	102,5	75 000	19,3
LARL 56	46,8	7,8	54,6	30	9,45	6	3,15	1	3,15	128,3	51,4	179,7	75 000	19,3
LARL 78	67,4	11,2	78,6	44	11,34	6	3,78	1	3,78	185	74	259	75 000	19,3
LARL125 PENGUIN	107,2	17,9	125,1	71	14,31	6	4,77	1	4,77	294	118	412	75 000	19,3
LARL 180	147,3	34,3	181,6	97	17,50	30	2,50	7	2,50	630	227	634	75 000	18
LARL 280 HAWK	241,7	39,4	281,1	157	21,80	26	3,44	7	2,68	870	262	929	72 000	19,1
LARL 380 GULL	337,3	43,7	381,0	217	25,38	54	2,82	7	2,82	1080	290	1222	66 000	19,5
LARL 455 CONDOR	402,3	52,2	454,5	259	27,72	54	3,08	7	3,08	1290	343	1457	66 000	19,5
LARL 510 RAIL	483,4	33,4	516,8	308	29,59	45	3,70	7	2,47	11740	221	1560	63 000	21,1
LARL 545 CARDINAL	484,5	62,8	547,3	312	30,42	54	3,38	7	3,38	15400	416	1755	66 000	19,5
LARL 600 BLUEJAY	563,9	39,1	603,0	359	31,98	45	4,00	7	2,66	13700	258	1821	63 000	21,1
LARL 820 PLOVER	725,1	91,9	817,0	468	37,21	54	4,14	19	2,48	22620	609	2628	63 000	19,6

(1) ARL Aluminium covered steel.
Note 2 – Outer layer stranding direction: Right-hand (Z).

ASTM B-549 standard

Characteristics of Aluminium conductors aluminium clad Steel reinforced (ACSR/AW) – Countries with North American influence

Code word	Alum. size (AWG/Kcmil)	Alum. Cross-section (mm²)	Total cross-section (mm²)	Outer diameter (mm)	N.º of wires Al/AW	Wire diameter		Rated strength (KgF)	Linear mass			Electrical resistance (Ω/Km)			
						Alum. (mm)	ARL (t) (mm)		Total (Kg/km)	Alum. (Kg/km)	ARL (Kg/km)	d.c. 20°C	a.c. - 60HZ		
													25°C	50°C	75°C
SWAN / AW	4	22,03	24,67	6,35	6/1	2,118	2,118	807	81,3	58,0	23,2	1,285	1,311	1,438	1,565
SWANATE / AW	4	22,48	26,50	6,53	7/1	1,961	2,614	1 034	93,3	58,0	35,3	1,251	1,276	1,399	1,523
SPARROW / AW	2	35,05	39,80	8,03	6/1	2,672	2,672	1 252	129,2	92,3	36,9	0,8078	0,8240	0,9035	0,9831
SPARATE / AW	2	35,79	42,20	8,26	7/1	2,474	3,299	1 592	148,7	92,4	56,3	0,7861	0,8016	0,8793	0,9570
ROBIN / AW	1	44,25	49,56	9,02	6/1	3,002	3,002	1 567	163,1	116,5	46,6	0,6398	0,6525	0,7159	0,7786

BARE OVERHEAD CONDUCTORS

Aluminium alloy conductor Aluminium clad steel reinforced (LARL) **ACSR · AW**

Code word	Alum. size (AWG/Kcmil)	Alum. Cross-section (mm²)	Total cross-section (mm²)	Outer diameter (mm)	N.º of wires Al/AW	Wire diameter		Rated strength (KgF)	Linear mass			Electrical resistance (Ω/Km)			
						Alum. (mm)	ARL (1) (mm)		Total (Kg/km)	Alum. (Kg/km)	ARL (Kg/km)	d.c. 20°C	a.c. - 60HZ		75°C
													25°C	50°C	
RAVEN / AW	1/0	55,79	62,46	10,11	6/1	3,371	3,371	1 927	205,7	146,9	58,8	0,5076	0,5177	0,5678	0,6180
QUAIL / AW	2/0	70,34	78,78	11,35	6/1	3,785	3,785	2 331	259,3	185,1	74,1	0,4012	0,4106	0,4504	0,4902
PIGEON / AW	3/0	88,53	99,17	12,75	6/1	4,247	4,247	2 859	326,5	233,2	93,3	0,3198	0,3264	0,3581	0,3897
PENGUIN / AW	4/0	111,7	125,1	14,30	6/1	4,770	4,770	3 486	412	294,2	177,7	0,2535	0,2590	0,2841	0,3091
WAXWING /AW	266,8	137,0	142,6	15,47	18/1	3,091	3,091	3 094	421,9	372,5	49,4	0,2088	0,2135	0,2341	0,2551
PARTRIDGE / AW	266,8	140,7	157,2	16,31	26/7	2,002	2,002	4 899	520,3	374,6	145,7	0,2024	0,2068	0,2271	0,2474
MERLIN / AW	336,4	172,8	179,9	17,37	18/1	3,472	3,472	3 873	532,4	470,0	62,4	0,1655	0,1694	0,1860	0,2026
LINNET / AW	336,4	177,6	198,4	18,31	26/7	2,248	2,248	6 128	656,5	472,7	193,8	0,1607	0,1643	0,1804	0,1965
ORIOLE / AW	336,4	170,6	210,3	18,82	30/7	2,691	2,691	7 598	736,9	473,4	263,4	0,1573	0,1608	0,1765	0,1923
CHICKADEE / AW	397,5	204,2	212,6	18,87	18/1	3,774	3,774	4 435	629	555,3	73,7	0,1400	0,1435	0,1576	0,1716
BRANT / AW	397,5	207,9	227,6	19,61	24/7	2,179	2,179	6 378	730,8	558,1	172,6	0,1373	0,1406	0,1544	0,1681
IBIS / AW	397,5	209,5	234,0	19,89	26/7	2,441	2,441	7 158	774,4	557,7	216,7	0,1360	0,1391	0,1527	0,1664
LARK / AW	397,5	213,1	248,4	20,47	30/7	2,924	2,924	8 904	870,5	559,3	311,2	0,1332	0,1362	0,1496	0,1629
PELIKAN / AW	477,0	245,1	255,2	20,68	18/1	4,135	4,135	5 198	754,9	666,5	88,4	0,1167	0,1191	0,1308	0,1425
FLICKER / AW	477,0	249,6	273,1	21,43	24/7	2,388	2,388	7 575	877,2	669,9	207,3	0,1144	0,1173	0,1288	0,1402
HAWK / AW	477,0	251,7	281,3	21,79	26/7	2,677	2,677	8 609	930,8	670,2	260,6	0,1133	0,1161	0,1274	0,1388
HEN / AW	477,0	255,8	298,1	22,43	30/7	3,203	3,203	10 614	1044	671,4	373,4	0,1110	0,1137	0,1247	0,1358
OSPREY / AW	556,5	285,8	297,6	22,33	18/1	4,465	4,465	6 010	880,3	771,2	103,1	0,1001	0,1030	0,1130	0,1230
PARAKEET / AW	556,5	291,2	318,7	23,22	24/7	2,578	2,578	8 741	1 023	781,5	241,7	0,09807	0,1007	0,1105	0,1203
DOVE / AW	556,5	293,5	328,0	23,55	26/7	2,891	2,891	9 943	1 085	781,2	303,9	0,09703	0,09961	0,1093	0,1190
EAGLE / AW	556,5	298,5	347,8	24,21	30/7	3,459	3,459	12 161	1 219	783,3	435,6	0,09512	0,09756	0,1070	0,1165
PEACOCK / AW	605,0	316,6	346,5	24,21	24/7	2,691	2,691	9 512	1 112	849,6	263,1	0,09019	0,09278	0,1018	0,1108
SQUAB / AW	605,0	318,9	356,3	24,54	26/7	3,012	3,012	10 700	1 179	848,9	330,0	0,09097	0,09181	0,1007	0,1096
TEAL / AW	605,0	324,0	376,4	25,25	30/19	2,164	2,164	12 905	1 314	851,3	463,2	0,08767	0,08998	0,09874	0,1074
KINGBIRD / AW	636,0	326,8	340,3	23,88	18/1	4,775	4,775	6 813	1 006	888,8	118,0	0,08750	0,09035	0,09905	0,1078
ROOK / AW	636,0	332,8	364,1	24,82	24/7	2,756	2,756	9 988	1 169	893,0	276,2	0,08583	0,08836	0,09688	0,1055
GROSBEEK / AW	636,0	335,4	374,7	25,15	26/7	3,089	3,089	11 254	1 240	892,8	346,9	0,08491	0,08737	0,09582	0,1043
EGRET / AW	636,0	340,7	395,8	25,88	30/19	2,220	2,220	13 576	1 382	895,0	487,4	0,08337	0,08563	0,09396	0,1023
FLAMINGO / AW	666,6	348,9	381,8	24,40	24/7	2,822	2,822	10 474	1 226	936,3	289,6	0,08186	0,08432	0,09246	0,1007

Code word	Alum. size (AW/GKcmil)	Alum. Cross-section (mm ²)	Total cross-section (mm ²)	Outer diameter (mm)	N.º of wires Al/AW	Wire diameter		Rated strength (KgF)	Linear mass			Electrical resistance (Ω/km)			
						Alum. (mm)	ARL (1) (mm)		Total (Kg/km)	Alum. (Kg/km)	ARL (Kg/km)	d.c. 20°C		a.c. - 60HZ	
												25°C	50°C	75°C	
GANNET / AW	666.6	351.5	392.7	25.76	26/7	4.067	3.162	11 794	1 299	935.7	363.6	0.08104	0.08339	0.09147	0.09955
STARLING / AW	715.5	377.4	421.6	26.70	26/7	4.214	3.277	12 465	1 395	1 005	390.4	0.07546	0.07780	0.08532	0.09284
REDWING / AW	715.5	383.0	445.0	27.46	30/19	3.922	2.352	15 146	1 554	1 006	547.7	0.07415	0.07631	0.08370	0.09110
TERN / AW	795.0	409.7	430.6	27.00	45/7	3.376	2.250	9 730	1 300	1 116	184.1	0.07005	0.07264	0.07960	0.08656
CUCKOO / AW	795.0	415.9	455.1	27.74	24/7	4.623	3.081	12 483	1 461	1 116	345.1	0.06867	0.07103	0.07786	0.08470
CONDOR / AW	795.0	416.3	455.6	27.76	54/7	3.084	3.084	12 624	1 463	1 117	345.4	0.06861	0.07096	0.07774	0.08457
DRAKE / AW	795.0	402.6	468.6	28.14	26/7	4.442	3.454	13 717	1 551	1 116	434.6	0.06792	0.07016	0.07693	0.08364
MALLARD / AW	795.0	425.9	494.8	28.96	30/19	4.135	2.482	16 833	1 728	1 119	608.7	0.06670	0.06879	0.075389	0.08203
RUDDY / AW	900.0	463.9	487.4	28.73	45/7	3.592	2.395	10 873	1 472	1 263	208.7	0.06188	0.06413	0.07022	0.07643
CANARY / AW	900.0	470.9	515.2	29.51	54/7	3.279	3.279	14 080	1 654	1 264	389.9	0.06067	0.06301	0.06898	0.07500
RAIL / AW	954.0	491.8	516.9	29.59	45/7	3.698	2.466	11 526	1 561	1 339	221.8	0.05837	0.06097	0.06674	0.07252
CARDINAL / AW	954.0	500.0	546.0	30.38	54/7	3.376	3.376	14 919	1 753	1 339	413.7	0.05722	0.05956	0.06519	0.07090
ORTOLAN / AW	1 033.5	533.1	560.4	30.81	45/7	3.851	2.568	12 329	1 692	1 453	239.6	0.05384	0.05647	0.06175	0.06705
CURLEW / AW	1 033.5	541.2	592.1	31.65	54/7	3.515	3.515	15 949	1 901	1 453	448.0	0.05279	0.05511	0.06052	0.06550
BLUEJAY / AW	1 113.5	564.1	603.3	31.98	45/7	3.995	2.664	13 277	1 822	1 563	260.0	0.05269	0.05267	0.05757	0.06251
FINCH / AW	1 113.5	582.2	635.8	32.84	54/19	3.647	2.189	17 028	2 045	1 570	474.8	0.04931	0.05165	0.05649	0.06134
BUNTING / AW	1 192.5	614.7	645.8	33.07	45/7	4.135	2.756	14 211	1 951	1 674	276.8	0.04669	0.04940	0.05395	0.05852
GRACKLE / AW	1 192.5	623.3	680.7	33.86	54/19	3.774	2.266	18 235	2 189	1 682	507.5	0.04603	0.04841	0.05291	0.05744
BITTERN / AW	1 272.0	655.7	689.1	34.16	45/7	4.270	2.847	15 159	2 081	1 786	294.7	0.04380	0.04655	0.05080	0.05507
PHEASANT / AW	1 272.0	665.3	726.5	35.10	54/19	3.899	2.339	19 246	2 337	1 795	541.7	0.04315	0.04556	0.04977	0.05399
DIPPER / AW	1 351.5	696.8	731.7	35.20	45/7	4.402	2.924	16 062	2 209	1 898	311.1	0.04121	0.04403	0.04801	0.05202
MARTIN / AW	1 351.5	706.4	771.7	36.17	54/19	4.018	2.410	20 435	2 481	1 907	574.5	0.04062	0.04308	0.04702	0.05099
BOBOLINK / AW	1 431.0	737.3	774.9	36.25	45/7	4.529	3.020	17 055	2 340	2 008	331.9	0.03891	0.04180	0.04555	0.04932
PLOVER / AW	1 431.0	748.5	817.5	37.21	54/19	4.135	2.482	21 650	2 628	2 020	608.7	0.03835	0.04086	0.04457	0.04830
NUTHATCH / AW	1 510.5	778.4	818.1	37.24	45/7	4.653	3.101	17 994	2 471	2 121	349.8	0.03688	0.03981	0.04334	0.04690
PARROT / AW	1 510.5	792.0	864.6	38.25	54/19	4.255	2.550	22 893	2 780	2 137	642.9	0.03626	0.03879	0.04228	0.04579
LAPWING / AW	1 590.0	818.4	860.1	38.15	45/7	4.770	3.180	18 920	2 596	2 228	367.6	0.03507	0.03810	0.04144	0.04481
FALCON / AW	1 590.0	831.6	907.8	39.24	54/19	4.359	2.616	24 059	2 920	2 243	677.2	0.03452	0.03712	0.04043	0.04377

Note 1 – Outer layer stranding direction: Right-hand (Z).

APPLICATION

Power ground wires for protection of aerial power lines of medium, high and extra high voltage. Specially recommended for aerial lines with large spans and in hazardous environments (contaminated or corrosive).

CONSTRUCTION CHARACTERISTICS

Conductors are made of one or several layers of bare aluminium wires stranded in concentric layers around an aluminium alloy core. To bring the cable to specific applications, it is possible to vary the relative proportion of the cross-sectional area of aluminium and aluminium alloy.

ACAR – “Aluminium Conductor Alloy Reinforced”

GENERAL CHARACTERISTICS

Good resistance to corrosion.

Good ratio for strength/weight, allowing the use in long span lengths.

ELECTRICAL AND DIMENSIONAL CHARACTERISTICS

ASTM B-524 standard

Characteristics of aluminium conductors aluminium alloy reinforced.

Size AWG- MCM	Cross- section mm ²	Composition		Outer diam. mm	Linear mass Kg/km	Rated strength N	Electrical resist. (Ω/km)			Current carrying capacity A (1)
		Aluminium	Alloy				d.c. 20°C	a.c. 25°C	a.c. 75°C	
30,6	15,52	4 x 1,68	3 x 1,68	5,04	42,7	3 670	1,9794	2,0166	2,3916	110
4	21,12	4 x 1,96	3 x 1,96	5,88	58,3	4 970	1,4506	1,4784	1,7534	140
48,7	24,71	4 x 2,12	3 x 2,12	6,36	68,0	5 760	1,2429	1,2667	1,5023	153
2	33,54	4 x 2,47	3 x 2,47	7,41	92,7	7 790	0,9113	0,9288	1,1015	190
77,5	39,19	4 x 2,67	3 x 2,67	8,01	108,2	8 940	0,7811	0,7962	0,9441	205
1/0	5,52	4 x 3,12	3 x 3,12	9,36	147,5	12 000	0,5733	0,5844	0,6930	253
123,3	62,44	4 x 3,37	3 x 3,37	10,11	172,2	13 650	0,4909	0,5005	0,5935	280
2/0	67,35	4 x 3,50	3 x 3,50	10,50	185,9	14 700	0,4546	0,4636	0,5497	290
155,4	78,55	4 x 3,78	3 x 3,78	11,34	217,1	17 100	0,3894	0,3971	0,4709	325
3/0	84,91	4 x 3,93	3 x 3,93	11,79	234,4	18 300	0,3607	0,3680	0,4363	335
195,7	99,30	4 x 4,25	3 x 4,25	12,75	273,4	21 300	0,3092	0,3156	0,3741	380
4/0	107,4	4 x 4,42	3 x 4,42	13,26	295,5	23 000	0,2859	0,2917	0,3459	400
246,9	125,1	4 x 4,77	3 x 4,77	14,31	345,0	26 900	0,2451	0,2503	0,2967	435
250	126,4	15 x 2,91	4 x 2,91	14,55	349,3	24 400	0,2345	0,2397	0,2854	400
250	126,4	12 x 2,91	7 x 2,91	14,55	349,3	27 600	0,2399	0,2450	0,2909	435
300	151,9	15 x 3,19	4 x 3,19	15,95	419,1	28 900	0,1952	0,1997	0,2379	500
300	151,9	12 x 3,19	7 x 3,19	15,95	419,1	32 800	0,1998	0,2042	0,2423	500
350	177,6	15 x 3,45	4 x 3,45	17,25	489,0	33 200	0,1676	0,1715	0,2042	555
350	177,6	12 x 3,45	7 x 3,45	17,25	489,0	37 400	0,1714	0,1754	0,2081	550
400	203,2	15 x 3,69	4 x 3,69	18,45	558,8	37 500	0,1465	0,1502	0,1787	610
400	203,2	12 x 3,69	7 x 3,69	18,45	558,8	42 350	0,1499	0,1536	0,1821	605



Size AWG-MCM	Cross- -section mm ²	Composition		Outer diam. mm	Linear mass Kg/km	Rated strength kN	Electrical resistance (Ω/km)			Current carrying capacity A (1)
		Aluminium	Alloy				d.c. 20°C	a.c. 25°C	a.c. 75°C	
450	228,1	15 x 3,91	4 x 3,91	19,55	626,8	41 600	0,1302	0,1337	0,1590	650
450	228,1	12 x 3,91	7 x 3,91	19,55	626,8	47 200	0,1333	0,1367	0,1620	645
500	253,3	15 x 4,12	4 x 4,12	20,60	698,5	46 200	0,1173	0,1206	0,1433	690
500	253,3	12 x 4,12	7 x 4,12	20,60	698,5	52 400	0,1200	0,1232	0,1460	685
500	252,9	33 x 2,95	4 x 2,95	20,65	698,5	44 400	0,1156	0,1189	0,1417	700
500	252,9	30 x 2,95	7 x 2,95	20,65	698,5	48 000	0,1170	0,1203	0,1430	690
500	252,9	24 x 2,95	13 x 2,95	20,65	698,5	52 900	0,1198	0,1230	0,1458	685
500	252,9	18 x 2,95	19 x 2,95	20,65	698,5	58 800	0,1227	0,1259	0,1487	680
550	278,5	15 x 4,32	4 x 4,32	21,60	768,3	50 800	0,1066	0,1097	0,1304	740
550	278,5	12 x 4,32	7 x 4,32	21,60	768,3	57 600	0,1091	0,1122	0,1329	730
550	279,3	33 x 3,10	4 x 3,10	21,70	768,3	48 100	0,1051	0,1083	0,1290	750
550	279,3	30 x 3,10	7 x 3,10	21,70	768,3	52 100	0,1063	0,1094	0,1302	740
550	279,3	24 x 3,10	13 x 3,10	21,70	768,3	57 600	0,1088	0,1120	0,1326	735
550	279,3	18 x 3,10	19 x 3,10	21,70	768,3	64 300	0,1115	0,1146	0,1352	730
600	303,5	15 x 4,51	4 x 4,51	22,55	838,1	55 400	0,09770	0,10075	0,11972	780
600	303,5	12 x 4,51	7 x 4,51	22,55	838,1	62 900	0,09997	0,10305	0,12195	775
600	303,2	33 x 3,23	4 x 3,23	22,61	838,1	52 500	0,09636	0,09944	0,11840	790
600	303,2	30 x 3,23	7 x 3,23	22,61	838,1	56 950	0,09747	0,10056	0,11945	785
600	303,2	24 x 3,23	13 x 3,23	22,61	838,1	62 750	0,09977	0,10285	0,12175	775
600	303,2	18 x 3,23	19 x 3,23	22,61	838,1	70 000	0,10220	0,10522	0,12411	765
650	330,0	33 x 3,37	4 x 3,37	23,59	908,1	56 950	0,08894	0,09199	0,10945	835
650	330,0	30 x 3,37	7 x 3,37	23,59	908,1	61 400	0,08996	0,09298	0,11043	830
650	330,0	24 x 3,37	13 x 3,37	23,59	908,1	68 100	0,09209	0,09508	0,11257	820
650	330,0	18 x 3,37	19 x 3,37	23,59	908,1	76 100	0,09436	0,09734	0,11480	810
700	354,0	33 x 3,49	4 x 3,49	24,43	977,9	60 500	0,08258	0,08560	0,10180	875
700	354,0	30 x 3,49	7 x 3,49	24,43	977,9	65 400	0,08353	0,08652	0,10266	870
700	354,0	24 x 3,49	13 x 3,49	24,43	977,9	76 500	0,08553	0,08852	0,10466	860
700	354,0	18 x 3,49	19 x 3,49	24,43	977,9	79 650	0,08760	0,09049	0,10673	850
750	380,8	33 x 3,62	4 x 3,62	25,34	1 047,7	64 100	0,07700	0,07992	0,09501	920
750	380,8	30 x 3,62	7 x 3,62	25,34	1 047,7	69 400	0,07789	0,08087	0,09590	910
750	380,8	24 x 3,62	13 x 3,62	25,34	1 047,7	76 100	0,07976	0,08264	0,09777	900
750	380,8	18 x 3,62	19 x 3,62	25,34	1 047,7	84 550	0,08169	0,08458	0,09970	890
800	404,3	33 x 3,62	4 x 3,73	26,11	1 117,6	68 100	0,07224	0,07520	0,08930	955
800	404,3	30 x 3,62	7 x 3,73	26,11	1 117,6	73 850	0,07310	0,07608	0,09019	945
800	404,3	24 x 3,62	13 x 3,73	26,11	1 117,6	81 000	0,07484	0,07782	0,09186	935
800	404,3	18 x 3,62	19 x 3,73	26,11	1 117,6	90 300	0,07664	0,07956	0,09367	925
850	430,7	33 x 3,73	4 x 3,85	26,95	1 187,4	71 200	0,06795	0,07087	0,08415	995
850	430,7	30 x 3,73	7 x 3,85	26,95	1 187,4	77 400	0,06873	0,07165	0,08497	985
850	430,7	24 x 3,73	13 x 3,85	26,95	1 187,4	85 450	0,07034	0,07326	0,08652	975
850	430,7	18 x 3,73	19 x 3,85	26,95	1 187,4	95 200	0,07208	0,07497	0,08825	965
900	455,7	33 x 3,85	4 x 3,96	27,72	1 257,3	75 650	0,06414	0,06713	0,07963	1 030
900	455,7	30 x 3,85	7 x 3,96	27,72	1 257,3	81 900	0,06490	0,06788	0,08035	1 020

Size AWG-MCM	Cross- -section mm ²	Composition		Outer diam. mm	Linear mass Kg/km	Rated strength kN	Electrical resistance (Ω/km)			Current carrying capacity A (1)
		Aluminium	Alloy				d.c. 20°C	a.c. 25°C	a.c. 75°C	
900	455,7	24 x 3,85	13 x 3,96	27,72	1 257,3	90 350	0,06644	0,06936	0,08187	1 010
900	455,7	18 x 3,85	19 x 3,96	27,72	1 257,3	99 700	0,06804	0,07087	0,08340	1 000
950	481,4	33 x 4,07	4 x 4,07	28,49	1 327,3	79 650	0,06083	0,06385	0,07562	1 070
950	481,4	30 x 4,07	7 x 4,07	28,49	1 327,3	86 350	0,06155	0,06457	0,07638	1 060
950	481,4	24 x 4,07	13 x 4,07	28,49	1 327,3	95 250	0,06299	0,06594	0,07776	1 050
950	481,4	18 x 4,07	19 x 4,07	28,49	1 327,3	106 400	0,06453	0,06742	0,07930	1 040
1 000	507,7	33 x 4,18	4 x 4,18	29,26	1 396,9	84 100	0,05778	0,06083	0,07198	1 090
1 000	507,7	30 x 4,18	7 x 4,18	29,26	1 396,9	90 800	0,05843	0,06146	0,07260	1 080
1 000	507,7	24 x 4,18	13 x 4,18	29,26	1 396,9	100 600	0,05981	0,06276	0,07395	1 065
1 000	507,7	18 x 4,18	19 x 4,18	29,26	1 396,9	112 200	0,06129	0,06427	0,07546	1 060
1 000	506,0	54 x 3,25	7 x 3,25	29,25	1 396,9	87 700	0,05784	0,06089	0,07208	1 080
1 000	506,0	48 x 3,25	13 x 3,25	29,25	1 396,9	93 900	0,05866	0,06171	0,07283	1 070
1 000	506,0	42 x 3,25	19 x 3,25	29,25	1 396,9	101 900	0,05951	0,06253	0,07372	1 065
1 000	506,0	33 x 3,25	28 x 3,25	29,25	1 396,9	110 400	0,06083	0,06378	0,07497	1 060
1 100	557,5	33 x 4,38	4 x 4,38	30,66	1 537	92 100	0,05253	0,05568	0,06575	1 175
1 100	557,5	30 x 4,38	7 x 4,38	30,66	1 537	100 100	0,05315	0,05623	0,06637	1 165
1 100	557,5	24 x 4,38	13 x 4,38	30,66	1 537	110 400	0,05440	0,05741	0,06755	1 150
1 100	557,5	18 x 4,38	19 x 4,38	30,66	1 537	123 300	0,05574	0,05873	0,06873	1 145
1 100	557,1	54 x 3,41	7 x 3,41	30,69	1 537	96 100	0,05256	0,05568	0,06581	1 170
1 100	557,1	48 x 3,41	13 x 3,41	30,69	1 537	101 900	0,05331	0,05636	0,06657	1 160
1 100	557,1	42 x 3,41	19 x 3,41	30,69	1 537	110 400	0,05407	0,05712	0,06726	1 150
1 100	557,1	33 x 3,41	28 x 3,41	30,69	1 537	118 400	0,05525	0,05833	0,06844	1 145
1 200	606,9	33 x 4,57	4 x 4,57	31,99	1 677	100 600	0,04813	0,05141	0,06053	1 220
1 200	606,9	30 x 4,57	7 x 4,57	31,99	1 677	109 000	0,04869	0,05190	0,06109	1 210
1 200	606,9	24 x 4,57	13 x 4,57	31,99	1 677	120 600	0,04984	0,05302	0,06220	1 200
1 200	606,9	18 x 4,57	19 x 4,57	31,99	1 677	134 400	0,05105	0,05420	0,06332	1 190
1 200	607,2	54 x 3,56	7 x 3,56	32,04	1 677	102 800	0,04816	0,05141	0,06060	1 215
1 200	607,2	48 x 3,56	13 x 3,56	32,04	1 677	109 900	0,04885	0,05203	0,06129	1 205
1 200	607,2	42 x 3,56	19 x 3,56	32,04	1 677	118 800	0,04954	0,05269	0,06191	1 200
1 200	607,2	33 x 3,56	28 x 3,56	32,04	1 677	128 200	0,05062	0,05377	0,06299	1 190
1 250	633,8	33 x 4,67	4 x 4,67	32,69	1 746	105 000	0,04623	0,04948	0,05830	1 255
1 250	633,8	30 x 4,67	7 x 4,67	32,69	1 746	113 900	0,04675	0,04997	0,05879	1 245
1 250	633,8	24 x 4,67	13 x 4,67	32,69	1 746	125 500	0,04787	0,05108	0,05984	1 230
1 250	633,8	18 x 4,67	19 x 4,67	32,69	1 746	140 200	0,04902	0,05213	0,06069	1 225
1 250	631,3	54 x 3,63	7 x 3,63	32,67	1 746	107 200	0,04629	0,04961	0,05837	1 245
1 250	631,3	48 x 3,63	13 x 3,63	32,67	1 746	114 400	0,04695	0,05016	0,05899	1 230
1 250	631,3	42 x 3,63	19 x 3,63	32,67	1 746	123 700	0,04760	0,05079	0,05968	1 225
1 250	631,3	33 x 3,63	28 x 3,63	32,67	1 746	133 500	0,04865	0,05184	0,06066	1 220
1 300	658,4	33 x 4,67	4 x 4,76	33,32	1 816	109 000	0,04446	0,04780	0,05623	1 290
1 300	658,4	30 x 4,67	7 x 4,76	33,32	1 816	118 400	0,04498	0,04829	0,05669	1 275
1 300	658,4	24 x 4,67	13 x 4,76	33,32	1 816	130 400	0,04603	0,04928	0,05774	1 265
1 300	658,4	18 x 4,67	19 x 4,76	33,32	1 816	145 500	0,04718	0,05039	0,05886	1 255

Size AWG-MCM	Cross- -section mm ²	Composition		Outer diam. mm	Linear mass Kg/km	Rated strength kN	Electrical resistance (Ω/km)			Current carrying capacity A (1)
		Aluminium	Alloy				d.c. 20°C	a.c. 25°C	a.c. 75°C	
1 300	659,4	54 x 3,63	7 x 3,71	33,39	1 816	116 700	0,04446	0,04780	0,05623	1 285
1 300	659,4	48 x 3,63	13 x 3,71	33,39	1 816	119 300	0,04511	0,04843	0,05686	1 270
1 300	659,4	42 x 3,63	19 x 3,71	33,39	1 816	128 600	0,04573	0,04905	0,05741	1 265
1 300	659,4	33 x 3,63	28 x 3,71	33,39	1 816	138 800	0,04675	0,04997	0,05843	1 260
1 400	710,1	54 x 3,85	7 x 3,85	34,65	1 955	117 900	0,04131	0,04475	0,05259	1 350
1 400	710,1	48 x 3,85	13 x 3,85	34,65	1 955	126 400	0,04190	0,04531	0,05315	1 335
1 400	710,1	42 x 3,85	19 x 3,85	34,65	1 955	137 100	0,04249	0,04587	0,05371	1 330
1 400	710,1	33 x 3,85	28 x 3,85	34,65	1 955	148 200	0,04341	0,04675	0,05449	1 325
1 500	758,9	54 x 3,98	7 x 3,98	35,82	2 095	126 400	0,03855	0,04206	0,04934	1 410
1 500	758,9	48 x 3,98	13 x 3,98	35,82	2 095	135 300	0,03911	0,04265	0,04984	1 395
1 500	758,9	42 x 3,98	19 x 3,98	35,82	2 095	146 800	0,03967	0,04314	0,05039	1 390
1 500	758,9	33 x 3,98	28 x 3,98	35,82	2 095	158 900	0,04052	0,04393	0,05115	1 380
1 600	809,3	54 x 4,11	7 x 4,11	36,99	2 235	135 300	0,03612	0,03976	0,04656	1 465
1 600	809,3	48 x 4,11	13 x 4,11	36,99	2 235	144 600	0,03661	0,04022	0,04698	1 450
1 600	809,3	42 x 4,11	19 x 4,11	36,99	2 235	156 600	0,03714	0,04072	0,04747	1 445
1 600	809,3	33 x 4,11	28 x 4,11	36,99	2 235	169 500	0,03796	0,04150	0,04829	1 435
1 700	861,3	54 x 4,24	7 x 4,24	38,16	2 375	143 300	0,03402	0,03780	0,04413	1 520
1 700	861,3	48 x 4,24	13 x 4,24	38,16	2 375	153 500	0,03451	0,03822	0,04455	1 505
1 700	861,3	42 x 4,24	19 x 4,24	38,16	2 375	166 400	0,03501	0,03871	0,04505	1 500
1 700	861,3	33 x 4,24	28 x 4,24	38,16	2 375	180 200	0,03576	0,03934	0,04573	1 490
1 750	885,8	54 x 4,30	7 x 4,30	38,70	2 445	147 700	0,03304	0,03684	0,04295	1 550
1 750	885,8	48 x 4,30	13 x 4,30	38,70	2 445	158 000	0,03350	0,03730	0,04344	1 535
1 750	885,8	42 x 4,30	19 x 4,30	38,70	2 445	171 300	0,03399	0,03773	0,04386	1 525
1 750	885,8	33 x 4,30	28 x 4,30	38,70	2 445	185 600	0,03471	0,03835	0,04455	1 520
1 800	910,7	54 x 4,36	7 x 4,36	39,24	2 515	151 700	0,03212	0,03599	0,04190	1 575
1 800	910,7	48 x 4,36	13 x 4,36	39,24	2 515	162 400	0,03258	0,03642	0,04232	1 560
1 800	910,7	42 x 4,36	19 x 4,36	39,24	2 515	176 200	0,03304	0,03684	0,04282	1 550
1 800	910,7	33 x 4,36	28 x 4,36	39,24	2 515	190 900	0,03376	0,03747	0,04344	1 545
1 900	961,6	54 x 4,48	7 x 4,48	40,32	2 655	160 200	0,03041	0,03438	0,03996	1 625
1 900	961,6	48 x 4,48	13 x 4,48	40,32	2 655	171 800	0,03087	0,03481	0,04039	1 610
1 900	961,6	42 x 4,48	19 x 4,48	40,32	2 655	186 000	0,03130	0,03524	0,04091	1 600
1 900	961,6	33 x 4,48	28 x 4,48	40,32	2 655	201 600	0,03199	0,03579	0,04140	1 590
2 000	1 013,8	54 x 4,60	7 x 4,60	41,40	2 793	168 600	0,02890	0,03301	0,03829	1 675
2 000	1 013,8	48 x 4,60	13 x 4,60	41,40	2 793	180 700	0,02930	0,03337	0,03558	1 660
2 000	1 013,8	42 x 4,60	19 x 4,60	41,40	2 793	195 800	0,02972	0,03376	0,03904	1 650
2 000	1 013,8	33 x 4,60	28 x 4,60	41,40	2 793	211 800	0,03038	0,03438	0,03960	1 640

Note 1 – (1) With the following conditions:

Ambient temperature = 25°C;

Conductor temperature = 75°C;

Wind velocity = 0,6 m/s. No full sun (Without solar radiation).

Note 2 – Outer layer stranding direction: Right-hand (Z).

APPLICATION

Composite optical ground wire for installation in electric aerial lines.

Recommended for high and extra high voltage aerial power lines.

Designed to have a larger stress-strain window, ensuring longevity of performance over the years.

OPGW – Optical Power Ground Wire

CONSTRUCTION CHARACTERISTICS

The optical fibres are lodged inside a stainless steel tube, filled with a moisture proof gel. For special designs it can be used a stainless steel tube coated with an aluminium tape. The stainless steel tube can be applied to the center or stranded together with the remaining wires of the first layer.

OPGW cable is formed by the stranding of one or more layers of aluminium wires, aluminium alloy, aluminium coated steel or a mixture of them. The use of one or more steel tubes is allowable depending on the number of fibres of the cable. In order to improve resistance to corrosion grease between layers can be applied.

ELECTRICAL, MECHANICAL AND DIMENSIONAL CHARACTERISTICS

OPGW Designation / N.º of fibres (examples)	Outer diameter	Approx. Weight	Maximum working tension	Rated strength	Short c. capacity c.c. I²t (a)
	(mm)	(kg/km)	(kgf)	(kgf)	(kA².sec.)
OPGW AS 68 ST 1 x 48F	11,4	485	3 050	7 630	18,3
OPGW AS/AA 39/94 AST 2 x 20F	15,8	565	2 895	7 235	90,0
OPGW AS/AA 34/170 ST 1 x 24F	19,0	726	3 600	9 010	320,9
OPGW AS/AA 38/226 ST 2 x 24F	21,7	922	4 700	11 750	541,1

$$(a) I_{cc} (t = \alpha \text{ seg}) = \sqrt{I^2 t / \alpha \text{ seg}}$$

Example: Icc of AS/AA 39/94 cable for 0,5 sec. = $\sqrt{90/0,5} = 13,4\text{kA}$

(Initial temperature before short-circuit: 40°C; final temperature after short-circuit: 200°C)

For other OPGW cables with different n.º of optical fibres, electrical and mechanical characteristics, please contact inform@cabelte.pt for information.

AA – Aluminium alloy;

AS – Aluminium-clad steel;

A – Aluminium;

ST – Stainless Steel tube;

AST – Sainless Steel tube covered with a aluminium tape.

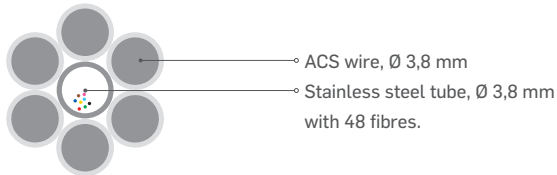
Example: AS/AA 39/94 AST 2x20F – OPGW cable consists of aluminium clad steel wires with total sectional area of 39 mm², aluminium alloy wires with total sectional area of 94 mm² and two aluminium coated stainless steel tubes having 20 optical fibres inside each.



SCHEMATIC CROSS-SECTION

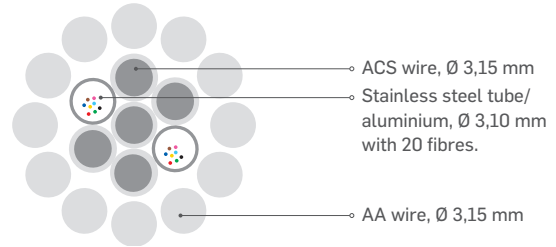
OPGW AS 68 ST 1 x 48F:

Outer diameter = 11,4 mm



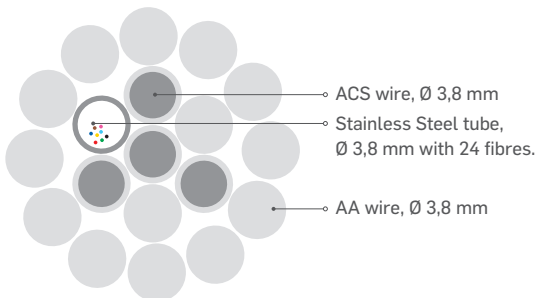
OPGW AS/AA 39/94 AST 2 x 20F:

Outer diameter = 15,8 mm



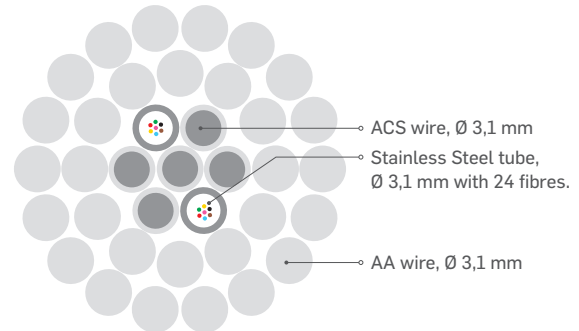
OPGW AS/AA 34/170 ST 1 x 24F:

Outer diameter = 19,0 mm



OPGW AS/AA 38/226 ST 2 x 24F:

Outer diameter = 21,7 mm



APPLICATION

Composite optical ground wire for installation in electric aerial lines.

Recommended for high and extra high voltage aerial power lines.

Designed to have a larger stress-strain window, ensuring longevity of performance over the years.

OPGW – Optical Power Ground Wire.

CONSTRUCTION CHARACTERISTICS

The optical fibres are lodged inside PBT “loose” tubes filled with gel. The tubes are stranded around a glass fibre (FRP) rod, and this optical core is thermal protected with a special tape.

The intertices of the optical core are filled with a hydrogen-absorbent gel.

The aluminium tube is applied over the optical core. Cable outer layer is made by stranded wires over the aluminium tube. The wires, depending on the final characteristics of the cable, will be of aluminium alloy, aluminium clad steel (aluminium covered steel) or a mixture of both.

ELECTRICAL, MECHANICAL AND DIMENSIONAL CHARACTERISTICS

OPGW Designation / N.º of fibres (examples)	Outer diameter (mm)	Approx. Weight (kg/km)	Maximum working tension (kgf)	Rated strength (kgf)	Short c. capacity c.c. I ² t (a) (kA ² .seg.)
AS/A 59/26 AL – 24F	12,8	479	3 120	7 800	43,2
AS/A 74/32 AL – 48F	14,7	614	3 780	9 460	76,8
AA/AS/A 42/42/52 AL – 24F	15,6	555	2 610	6 530	162
AA/AS/A 65/65/58 AL – 48F	18,5	798	3 710	9 285	288

(a) $I_{cc} (t = \alpha \text{ seg}) = \sqrt{I^2 t / \alpha \text{ seg}}$

Example: I_{cc} of AA/AS/A 65/65/58 AL cable for 0,5 sec = $\sqrt{288 / 0,5} = 24 \text{ kA}$

(Initial temperature before short-circuit: 40°C; final temperature after short-circuit: 200°C)

For other OPGW cables with different n.º of optical fibres, electrical and mechanical characteristics, please contact inform@cabelte.pt for information.

AA – Aluminium alloy;

AS – Aluminium-clad steel (ARL);

A – Aluminium (tube).

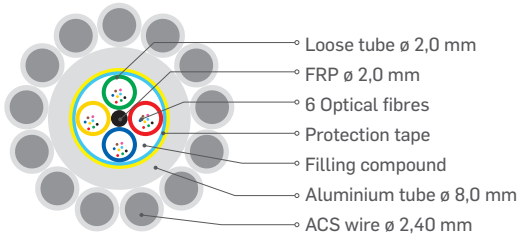
AA/AS/A 65/65/58 – OPGW cable formed by aluminium alloy wires with total sectional area of 65 mm² and aluminium covered steel wires with total sectional area of 65 mm² stranded over an aluminium tube with cross-sectional area of 58 mm².



SCHEMATIC CROSS-SECTION

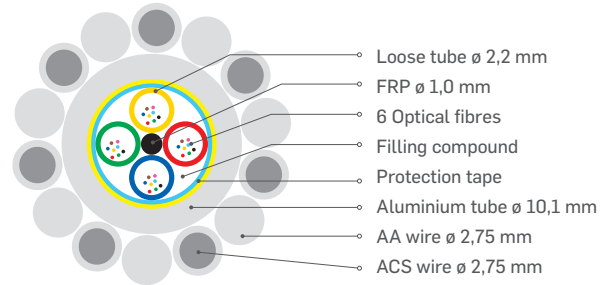
AS/A 59/26 AL – 24F:

Outer diameter = 12,8 mm



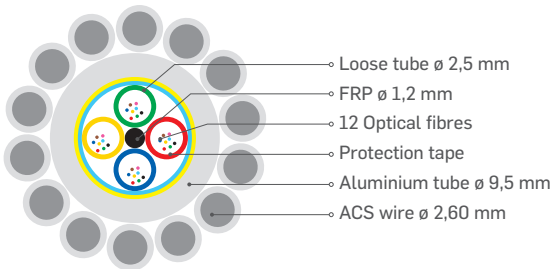
AA/AS/A 42/42/52 AL – 24F:

Outer diameter = 15,6 mm



AS/A 74/32 AL – 48F:

Outer diameter = 14,7 mm



AA/AS/A 65/65/58 AL – 48F:

Outer diameter = 18,8 mm

