PRODUCTS CATALOGUE

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A subsidiary of **ELSEWEDY CABLES - AAMAL** joint venture | DOHA CABLES

Products Catalogue

DOHA CABLES in brief

DOHA CABLES is a subsidiary of **SENYAR INDUSTRIES** – a joint venture between **ELSEWEDY CABLES** and **AAMAL.**

ELSEWEDY CABLES was established in 1984 and is considered one of the oldest and the most successful industrial and trading business entity across the MENA region in the fields of energy. Over the years company has been prosperously performing under conditions of developing and changing world economy.

With our roots going back over 70 years, running successfully 23 production facilities in 12 countries in Africa, Europe and Asia, exporting our wide range of high quality and safe products to more than 110 countries worldwide, **ELSEWEDY CABLES** offers the international business community a variety of world-class and cutting-edge products and services. During last decade countries of GCC and particularly Qatar have acquired high-end products of **ELSEWEDY CABLES Holding Company**. With our firm position of a market leader and concentration on establishing business presence in the world community in order to leverage on globalization basis, strategic decision to invest in Qatari growing economy has been made.

AAMAL Company Q.S.C is one of the GCC's fastest growing diversified conglomerates. Focused on sustained, profitable growth and strongly diversified for balanced exposure across Qatar's growing economy, **AAMAL**'s operations comprise over 18 business units with market leading positions in the key sectors: property management and development, industrial manufacturing, trading and distribution, managed services. Listed on the Qatar Exchange, **AAMAL** currently ranks in the top 10 listed companies by market capitalization. **AAMAL Company**'s diversified sources of income provide strength and higher return on investment. Through international partnerships and ventures, **AAMAL** aims to build a solid industrial base, utilizing the best know-how and expertise to fulfill the market needs.

In partnership agreement between **ELSEWEDY CABLES** and **AAMAL Company Q.S.C** was established **SENYAR INDUSTRIES Qatar Holding** where both companies incorporated and held 50% each. **SENYAR INDUSTRIES** plans to introduce several industrial projects in Qatar catering for rising demands of the industrial sector. **DOHA CABLES** is the first project introduced by **SENYAR INDUSTRIES**. With such substantial foundation and the vast experience of parent companies, **DOHA CABLES** being the first cable manufacturer in Qatar moves Qatari cable market to a new phase keeping in pace with significant economic development.

State-of-the-art Manufacturing Facility with production capacity of 40,000 ton of copper per annum and total area of 70,000 square meters arose in the heart of Mesaieed Industrial City. **DOHA CABLES** goal is to provide its customers with the highest quality products, fastest manufacturing period and quick-to-market solutions that can address its clients' needs whether it's limited timing condition or the most specific requirement. **DOHA CABLES** range of products covers current market demand and it is open for any further extending demand as well. Factory cutting-edge technology is achieved owing to a unique combination of core competences, professional project management, interdisciplinary teams and state-of-the-art manufacturing facilities, which maintain the highest safety standards. **DOHA CABLES** is committed to producing its products in an environmentally sound and responsible manner. By bridging natural, manufacturing, human and innovative resources **DOHA CABLES** is well equipped to establish a firm foundation that is necessary for its growth into an advanced cable manufacturer and market leader.

Doha Cables Driven Benefits

- The First Local Cable Manufacturer in Qatar.
- Factory Production Capacity = 40000 Ton/annum.
- Latest Manufacturing Facilities.
- Providing Products according to Customer's Specifications.
- Competitive Prices.
- Efficient Delivery Period.

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General Information

Selecting a Power Cable

The following factors are important when selecting a suitable cable construction which is required to transport electrical energy from the power station to the consumer:

- Maximum operating voltage.
- Insulation level.
- Frequency.
- Load to be carried.
- Magnitude and duration of possible overload.
- Magnitude and duration of short-circuit current.
- Voltage drop.
- Length of line.
- Type of installation.
  - Underground (direct or in ducts).
  - In air.
- Chemical and physical properties of soil.
- Max. and min. ambient air temperatures and soil temperature.
- Specification and requirements to be met.

Voltage

The strandard rated voltage of a cable is denoted by Uo/U (Um),

where

Uo: is the rated power-frequency voltage between conductor and earth or metallic screen.

U: is the rated power-frequency voltage between conductors.

Um: is the maximum continuously permissible operating voltage of a cable at time or in any part of the network.

U_o/U (kV)	0.6/1	1.8/3	3.6/6	6/10	8.7/15	12/20	18/30	38/66	76/132	127/220
U_m (kV)	1.2	3.6	7.2	12	17.5	24	36	72.5	145	245

Note: Cable design for 6/10, 12/20 and 18/30 kV is applicable for 6.35/11, 12.7/22 and 19/33 kV respectively.

Standards

Cables described in this catalogue are standard types, and their performance has been proved in operation. Construction and tests are in accordance with the recommendation of IEC publications where ever applicable. Power cables in accordance to other standard (e.g. BS, HD, NEMA) can be manufactured upon customer's request.

Weight and Dimension

Weight and dimension are approximate.
The deviations are due to manufacturing tolerance.

Jacket Marking

Standard embossed outer Jacket Marking consisting of:

1- Name of manufacturer " Doha Cables "
2- Type designation, size of conductor, rated voltage.
3- Continous length marking every meter.
4- Year of manufacture.
5- Any special part no. on request.

Standards Related to Power Cables

IEC Standard

S/N	No. of IEC	Subject
1.	60028	International Standard of Resistance for Copper.
2.	60060-1	High-Voltage Test Techniques
3.	60104	Aluminum-Magnesium-Silicon Alloy Wire for Overhead Line Conductors
4.	60121	Recommendation for commercial annealed aluminum electrical conductor wire.
5.	60137	Insulated bushings for alternating voltage above 1000 V.
6.	60173	Colours of the cores of flexible cables and cores.
7.	60183	Guide to the selection of high voltage cables.
8.	60227	Polyvinyl chloride insulated cables of rated voltages up to and including 450/750 V
9.	60228	Conductors of insulated cables.
10.	60229	Tests on cable over-sheaths which have a special protection function and are applied by extrusion.
11.	60230	Impulse tests on cables and their accessories.
12.	60270	Partial discharge measurements
13.	60287	Current rating equations (100% load factor) and calculation of losses
14.	60331	Tests for electric cables under fire conditions circuit integrity.
15.	60332	Test on electric cables under fire conditions.
16.	60502	Cables for rated voltages of 0.6 kV (Um=1kV) up to and including 30kV (Um=36kV).
17.	60719	Calculation of the lower and upper limits for the average outer dimensions of cables
		with circular copper conductors and of rated voltages up to and including 450/750 V.
18.	60724	Guide to the short-circuit temperature limits of electric cables with a rated voltage
		not exceeding 0.6/1 kV.
19.	60811	Common test methods for insulating and sheathing materials of electric cables
20.	60840	Test method and requirements
		Power cables with extruded insulation and their accessories for rated voltages
		above 30 kV (Um=36kV) up to 150 kV (Um=170kV).
21.	60853	Calculation of the cyclic and emergency current rating of cables.
22.	60885	Electrical test for electric cables

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S/N	No. of IEC	Subject
23.	60888	Zinc-Coated steel wires for stranded conductors
24.	60889	Hard drawn aluminum wire for overhead line conductors
25.	60949	Calculation of thermally permissible short-circuit currents, taking
		into account non-adiabatic heating effects.
26.	60986	Guide to the short-circuit temperature limits of electric cables with a rated voltage
		from 1.8/3 (3.6) kV to 18/30 (36) kV.
27.	61089	Round wire concentric lay overhead electrical stranded conductors.
28.	61232	Aluminum - clad steel wires for electrical purposes.
29.	61597	Overhead electrical conductors - calculation methods for stranded bare conductors.
30.	61443	Short circuit temperature limits of electric cables with rated voltages
		above 30 kV (U_m=36 kV).
31.	62067	Power cable with extruded insulation and their accessories for rated voltages above
		150 kV (U_m=170kV) up to 500kV (U_m=550 kV) - Test methods and requirements

HD Standard

S/N	No. of HD	Subject
1.	HD 21.1 S4	Cables of rated voltages up to and including 450/750 V and having thermoplastic insulation
2.	HD 21.3 S3	Polyvinyl chloride insulated cables of rated voltages up to and including 450/750V
3.	HD 603	Electric Power distribution, electric cable, insulated cable, polyvinyl chloride.
		Specification, dimension, test, marking
4.	HD 620	Distribution cables with exlruded insulation for rated voltages from 3.6/6(7.2)kV to 20.8/36(42)kV
5.	HD 626	Overhead distribution cables of rated voltage U_0 /U (U_m):0.6/1 (1.2)kV
6.	HD 632	Power cables with exlruded insulation and their accessories for rated voltages above 36 kV (U_m =
		42 kV) up to 150 kV (U_m = 170 kV)

► cont'd

Standards Related to Power Cables

BS Standard

S/N	No. of BS	Subject
1.	BS 215-1	Aluminum conductors and Aluminum conductors, steel-reinforced for overhead power transmission.
		Part1: Aluminum stranded conductors.
2.	BS 215-2	Aluminum conductors and Aluminum conductors, steel-reinforced for overhead power transmission.
		Part2: Aluminum stranded conductors, steel reinforced.
3.	BS 2627	Wrought aluminum for electrical purposes Wire.
4.	BS 5099	Spark testing of electric cables.
5.	BS 5467	600/1000 V and 1900/3300 V armoured electric cables having thermosetting insulation.
6.	BS 6004	Electric cables - PVC insulation, non-armoured cables for voltages up to and including 450/750 V
		for electric power, lighting and internal wiring.
7.	BS 6007	Electric cables - single core unsheathed heat resisting cables for voltages up to and including 450/750V
		for internal wiring.
8.	BS 6346	600/1000 V and 1900/3300 V armoured electric cables having PVC insulation.
9.	BS 6360	Conductors in insulated cables and cords.
10.	BS 6387	Performance requirements for cables required to maintain circuit integrity underfire conditions.
11.	BS 6485	PVC- covered conductors for overhead power lines.
12.	BS 6500	Electric cables - Flexible cords rated up to 300/500 V, for use with appliances and equipment intended
		for domestic, office and similar environments.
13.	BS 6622	Cables with extruded cross-linked polyethylene or ethylene propylene rubber insulation for rated
		voltages from 3.8/6.6KV up to 19/33 KV
14.	BS 7655	Insulation and sheathing materials for cables.
15.	BS 7884	Copper and copper-cadmium stranded conductors for overhead electric traction and power
		transmission systems.
16.	BS 7889	Electric cables - Thermosetting insulated, unarmoured cables for avoltage of 600/1000V.
17.	BS 7919	Electric cables - Flexible cables rated up to 450/750 V, for use with appliances and equipment intended
		for industrial and similar environments.

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S/N	No. of BS	Subject
1.	BS EN 10218-1	Steel wire and products- Part1: Test Methods
2.	BS EN 10218-2	Steel wire and products- Part2: wire dimensions and tolerances
3.	BS EN 10244-2	Steel wire and products- Non-ferrous metallic coating on steel wire-part2: Zinc or zinc alloy coatings
4.	BS EN 10257	Zinc or zinc alloy coated non-alloy steel wire for armouring either power cables or telecommunication
		cables.
5.	BS EN 12548	Lead and lead alloyes - lead alloy ingots for electric cable sheathing and for sleeves
6.	BS EN 12659	Lead and lead alloys - lead
7.	BS EN 13601	Copper and copper alloys - Copper rod, bar and wire for general electrical purposes
8.	BS EN 13602	Copper and copper alloys - Drawn, round copper wire for the manufacture of electrical conductors
9.	BS EN 50182	Conductors for overhead lines - Round wire concentric lay stranded conductors.
10.	BS EN 50183	Conductors for overhead lines - Aluminum - magnesium - silicon alloy wires
11.	BS EN 50189	Conductors for overhead lines - Zinc coated steel wires
12.	BS EN 50266	Common test methods for cables under fire conditions - Test for vertical flame spread of verticaly-
		mounted bunched wires or cables.
13.	BS EN 50356	Method for spark testing of cables
14.	BS EN 50395	Electrical test methods for low voltage energy cables (Supersedes HD 21.2)
15.	BS EN 60811	Insulating and sheathing materials of electric cables. common test methods.

Definitions

Definitions of dimensional values

1. **Nominal value**
   Value by which a quantity is designated and which is often used in tables. Usually, in IEC standard, nominal values give rise to values to be checked by measurements taking into account specified tolerances.

2. **Approximate value**
   Value which is neither guaranteed nor checked; it is used, for example, for the calculation of other dimensional values.

3. **Median value**
   When several test results have been obtained and ordered in an increasing (or decreasing) succession, the median value is the middle value if the number of available values is odd, and the mean of the two middle values if the number is even.

4. **Fictitious value**
   Value calculated according to the "fictitious method" described in annex A in IEC 60502.

Definitions concerning Tests

1. **Routine tests**
   Tests made by the manufacturer on each manufactured length of cable to check that each length meets the specified requirements.

2. **Sample tests**
   Tests made by the manufacturer on samples of completed cable or components taken from a completed cable, at a specified frequency, so as to verify that the finished product meets the specified requirements.

3. **Type tests**
   Test made before supplying, on a general commercial basis, a type of cable covered by this standard, in order to demonstrate satisfactory performance characteristics to meet the intended application. These tests are of such a nature that, after they have been made, they need not be repeated, unless changes are made in the cable materials or design or manufacturing process, which might change the performance characteristics.

4. **Electrical test after installation**
   Tests made to demonstrate the integrity of the cable and its accessories as installed.

Technical Data & Cables Parameters

1. Resistance

The values of conductor DC resistance given in the following tables are based on 20 °C. In case the DC resistance is required at any other temperature the following formula is used

$R_\theta = R_{20} [1+\alpha (\theta - 20)]$ Ω/km

Where

R_θ	: Conductor DC resistance at θ °C	Ω/km
R_{20}	: Conductor DC resistance at 20 °C	Ω/km
θ	: Operating temperature	°C
α	: Resistance temperature coefficient	1 / °C

= 0.00393 for Copper
= 0.00403 for Aluminium

To get AC resistance of the conductor at its operating temperature the following formula is used

$R_{AC} = R_\theta (1+ y_p + y_s)$

Where

y_p and y_s are proximity and skin effect factors respectively which depend on operation frequency and cable spacing.

2. Inductance

The self and mutual inductance are formulated as follow:

$L= K + 0.2 \ln (\frac{2S}{d})$ mh/km

Where

L	: Inductance	mh/km
K	: Constant depends on the conductor's number of wires	
d	: Conductors diameter	mm
S	: Axial spacing between cables in trefoil formation	mm
S	: 1.26 x axial spacing between cables in flat formation	mm

3. Capacitance

The capacitance is formulated as follow

$C = \frac{\epsilon_r}{18 \ln \frac{D}{d}}$ µf/km

Where

C	: Capacitance	µf/km
ϵ_r	: Relative permittivity of insulation material	
D	: Diameter over insulation	mm
d	: Conductor diameter	mm

4. Insulation Resistance

The Insulation Resistance is formulated as follow

$R = K \ln (\frac{D}{d})$

Where

R	: Insulation resistance	MΩ/km
K	: Constant depends on the insulation material	
d	: Diameter of the conductor (including the semiconducting layer)	mm
D	: Diameter of the insulated core	mm

5. Charging Current

The charging current is the capacitive current which flows when AC voltage is applied to the cables as a result of the capacitance between the conductor and earth, and for a multicore cable in which cores are not screened, between conductors. The value can be derived from the following equation.

$I_C = U_O \omega C 10^{-6}$ A/km

Where

I_C	: Charging current	A/km
U_O	: Voltage between phase and earth.	V
ω	: 2 π f	
f	: Frequency	Hz
C	: Capacitance to neutral	µf/km

6. Dielectric Losses

The dielectric losses of an AC cable are proportional to the capacitance, the frequency, the phase voltage and the power factor. The value can
be derived from the following equation.

$W_D = 2 \pi f C U_o^2 \tan \delta 10^{-6}$ watt/km/phase

Where

W_D	: Dielectric losses watt/km/phase	
f	: Frequency	Hz
C	: Capacitance to neutral	µf/km
U_O	: Voltage between phase and earth	V
tan δ	: Dielectric power factor	

7. Cable Ampacity

Cable ampacity or current carrying capacity is defined as the continuous maximum current the cable can carry at its maximum operating temperature.
In the technical information tables the following installation conditions were assumed during the current calculation:

- Ambient air temperature = 40 °C
- Ground temperature = 35 °C
- Ground thermal resistivity = 120 °C. cm/Watt
- Burial depth = 0.5 mt.

- In case of installation conditions are different from the stated, derating factors tabulated in tables 2 to 10 must be used for calculating the new current carrying capacity.
- All cable ampacities are based on IEC 60287

8. Cable Short Circuit Capacity

Tables 12-16 give the short circuit current for conductor and screen based on the following conditions

A- Short circuit starts from the maximum operating conductor/screen temperature.

B- Maximum temperature during short circuit

C- Maximum short circuit current duration is 5 seconds.

If the short circuit current is required at duration not metioned in the catalogue, it is obtained by dividing the short circuit current for 1 second by the square root of the required duration as follows:

$$I_{s.c.t} = \frac{I_{s.c.1}}{\sqrt{t}}$$

Where

$I_{s.c.t}$	: Short circuit current for t second	kA
$I_{s.c.1}$	: Short circuit current for 1 second	kA
t	: Duration	Sec.

9. Voltage Drop

When current flows in a cable conductor there is a voltage drop between the ends of the conductor which is the product of the current and the impedance.

The following equations should be used to calculate the voltage drop:

A. Single phase circuit.

$$V_d = 2\, I\, \ell\, (R \cos \varnothing + X \sin \varnothing) \quad V$$

B. Three phase circuit.

$$V_d = \sqrt{3}\, I\, \ell\, (R \cos \varnothing + X \sin \varnothing) \quad V$$

Where

V_d	: Voltage drop	V
I	: Load current	A
R	: AC Resistance	Ω/km
X	: Reactance	Ω/km
cos ø	: Power factor	
ℓ	: Length	km
$X = \omega\, L\, 10^{-3}$		Ω/km

ω= 2 π f
L = from tables
mh/km
Relation between cos ø and sin ø

Cos Ø	1.0	0.9	0.8	0.71	0.6	0.5
Sin Ø	0.0	0.44	0.6	0.71	0.8	0.87

* L.V. cable systems should be planned so as not to exceed voltage drop 3-5 % in normal operating conditions.
* Voltage drop data for L.V. Cable (Single & Multi Core) are tabulated in Tables 17 & 18.

Metals Used for Cables

Table 1

Electrical Properties

Metal	Relative Conductivity Copper 100%	Electrical Resistivity at 20 °C ohm. m (10^{-8})	Temperature Coefficient of Resistance per °C
Copper (annealed)	100	1.7241	0.00393
Copper (hard drawn)	97	1.777	0.00393
Tinned copper	95 - 97	1.741 - 1.814	0.00393
Aluminium	61	2.8264	0.00403
Lead	8	21.40	0.00400

Physical Properties

Property	Unit	Copper	Aluminium	Lead
Density at 20 °C	kg / m^3	8890.0	2703.0	11340.00
Coeff. thermal expansion	Per °C x 10^{-6}	17.0	23.0	29.00
Melting point	°C	1083.0	659.0	327.00
Thermal conductivity	W/cm °C	3.8	2.4	0.34
Ultimate tensile strength	Mn/m^2	225.0	70-90	-

Derating Factors

Table 2

Ground Temperature Derating Factor

Ground Temperature °C	15	20	25	30	35	40	45	50	55
PVC cables rated 70 °C	1.25	1.19	1.13	1.07	1.00	0.93	0.85	0.76	0.65
XLPE cables rated 90 °C	1.16	1.13	1.09	1.04	1.00	0.95	0.90	0.85	0.80

Table 3

Air Temperature Derating Factor

Air temperature °C	20	25	30	35	40	45	50	55
PVC cables rated 70 °C	1.29	1.22	1.15	1.08	1.00	0.95	0.82	0.71
XLPE cables rated 90 °C	1.18	1.14	1.10	1.05	1.00	0.90	0.89	0.84

Derating Factors

Table 4

Burial Depth Derating Factor

Depth of Laying mt.	Cables Cross Section		
	Up to 70 mm^2	95 up to 240 mm^2	300 mm^2 & above
0.50	1.00	1.00	1.00
0.60	0.99	0.98	0.97
0.80	0.97	0.96	0.94
1.00	0.95	0.93	0.92
1.25	0.94	0.92	0.89
1.50	0.93	0.90	0.87
1.75	0.92	0.89	0.86
2.00	0.91	0.88	0.85

Table 5

Soil Thermal Resistivity Derating Factor

Soil Thermal Resistivity in °C. cm/Watt	80	90	100	120	150	200	250	300
Rating factor	1.17	1.12	1.07	1.0	0.91	0.80	0.73	0.67

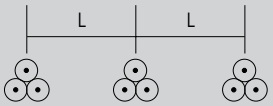
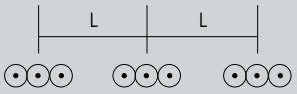
Table 6

PVC Rated Temperature Derating Factor

Type of PVC Rated Temperature °C	70	85
Rating factor	1.000	1.195

Table 7

Trefoil or Flat Formation Derating Factors for Three Single Core Cables Laid Direct in Ground

Number of Circuits	 Trefoil formation		 Flat formation			
	Touching		Spacing = 0.15 M		Spacing = 0.30 M	
nr	Trefoil	Flat	Trefoil	Flat	Trefoil	Flat
2	0.77	0.80	0.82	0.85	0.88	0.91
3	0.66	0.69	0.73	0.76	0.80	0.83
4	0.60	0.63	0.68	0.71	0.74	0.77
5	0.56	0.59	0.64	0.67	0.72	0.75
6	0.53	0.57	0.61	0.64	0.70	0.73

* L = Spacing

Derating Factors

Table 8

Trefoil Formation Derating Factors for Multi-core Core Cables Laid Direct in Ground

Number of Circuits	Trefoil Formation				Flat Formation	
	Touching		Spacing = 0.15 M		Spacing = 0.30 M	
nr	Trefoil	Flat	Trefoil	Flat	Trefoil	Flat
2	0.81	0.81	0.87	0.87	0.91	0.91
3	0.69	0.70	0.76	0.78	0.82	0.84
4	0.62	0.63	0.72	0.74	0.77	0.81
5	0.58	0.60	0.66	0.70	0.73	0.78
6	0.54	0.56	0.63	0.67	0.70	0.76

* L = Spacing

Table 9

Reduction factors for groups of more than one multi-core cable in air
To be applied to the current-carrying capacity for one multi-core cable in free air

Number of Trays	Number of Cables						Method of installation
	1	2	3	4	6	9	
1	1.00	0.88	0.82	0.79	0.76	0.73	Cables on perforated trays — Touching
2	1.00	0.87	0.80	0.77	0.73	0.68	
3	1.00	0.86	0.79	0.76	0.71	0.66	
1	1.00	1.00	0.98	0.95	0.91	-	Cables on perforated trays — Spaced
2	1.00	0.99	0.96	0.92	0.87	-	
3	1.00	0.98	0.95	0.91	0.85	-	
1	1.00	0.88	0.82	0.78	0.73	0.72	Cables on vertical perforated trays — Touching
2	1.00	0.88	0.81	0.76	0.71	0.70	
1	1.00	0.91	0.89	0.88	0.87	-	Cables on vertical perforated trays — Spaced
2	1.00	0.91	0.88	0.87	0.85	-	
1	1.00	0.87	0.82	0.80	0.79	0.78	Cables on ladder supports, cleats, etc. — Touching
2	1.00	0.86	0.80	0.78	0.76	0.73	
3	1.00	0.85	0.79	0.76	0.73	0.70	
1	1.00	1.00	1.00	1.00	1.00	-	Cables on ladder supports, cleats, etc. — Spaced
2	1.00	0.99	0.98	0.97	0.96	-	
3	1.00	0.98	0.97	0.96	0.93	-	

NOTE 1 Values given are averages for the cable types and range of conductor sizes considered. The spread of values is generally less than 5%

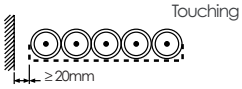
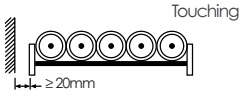
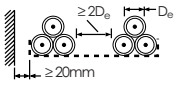
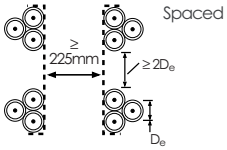
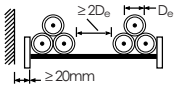
NOTE 2 Factors apply to single layer groups of cables as shown above and do not apply when cables are installed in more than one layer touching each other. Values for such installations may be significantly lower and must be determined by an appropriate method.

NOTE 3 Values are given for vertical spacing between trays of 300 mm and at least 20 mm between trays and wall. For closer spacing, the factors should be reduced.

NOTE 4 Values are given for horizontal spacing between trays of 225 mm with trays mounted back to back. For closer spacing the factors should be reduced.

Table 10

Reduction factors for groups of more than one circuit of single-core cables (Note 2)
To be applied to the current-carrying capacity for one circuit of single-core cables in free air

Number of Trays	Number of Cables			Use as a multiplier to rating for	Method of installation	
	1	2	3			
1	0.98	0.91	0.87	Three cables in horizontal formation	Perforated trays (Note 3)	
2	0.96	0.87	0.81			
3	0.95	0.85	0.78			
1	1.00	0.97	0.96	Three cables in horizontal formation	Ladder supports, cleats, etc. (Note 3)	
2	0.98	0.93	0.89			
3	0.97	0.90	0.86			
1	1.00	0.98	0.96	Three cables in trefoil formation	Perforated trays (Note 3)	
2	0.97	0.93	0.89			
3	0.96	0.92	0.86			
1	1.00	0.91	0.89		Vertical perforated trays (Note 4)	
2	1.00	0.90	0.86			
1	1.00	1.00	1.00		Ladder supports, cleats, etc. (Note 3)	
2	0.97	0.95	0.93			
3	0.96	0.94	0.90			

NOTE 1 Values given are averages for the cable types and range of conductor sizes considered. The spread of values is generally less than 5%

NOTE 2 Factors are given for single layers of cables (or trefoil groups) as shown in the table and do not apply when cables are installed in more than one layer touching each other. Values for such installations may be significantly lower and should be determined by an appropriate method.

NOTE 3 Values are given for vertical spacings between trays of 300 mm. For closer spacing, the factors should be reduced.

NOTE 4 Values are given for horizontal spacing between trays of 225 mm with trays mounted back to back. For closer spacing, the factors should be reduced.

NOTE 5 For circuits having more than one cable in parallel per phase, each three phase set of conductors should be considered as a circuit for the purpose of this table.

Short Circuit Current

Table 11

Max. Short Circuit Temperature for Cable Components

Material	Item	Temp. °C
Insulation	PVC insulation	140 For C.S.A > 300 mm^2
		160 For C.S.A ≤ 300 mm^2
	XLPE insulation	250
Jacket	PVC sheathing	200
	LLDPE sheathing	150
	HDPE sheathing	180
Metal	Lead sheath	170
	Lead sheath - alloy	200*
	Copper	250
	Aluminum	250

* Temp. = 210 °C for cables with rated voltages above 30kV (U_m=36 kV),

Table 12

kA Short Circuit Current - Copper Conductor - PVC Insulated

C.S.A. mm^2	Duration sec.									
	0.1	0.2	0.3	0.4	0.5	1.0	2.0	3.0	4.0	5.0
16	5.8	4.1	3.4	2.9	2.6	1.8	1.3	1.1	0.9	0.8
25	9.1	6.4	5.2	4.5	4.1	2.9	2.0	1.7	1.4	1.3
35	12.7	9.0	7.3	6.4	5.7	4.0	2.8	2.3	2.0	1.8
50	18.2	12.9	10.5	9.1	8.1	5.8	4.1	3.3	2.9	2.6
70	25.5	18.0	14.7	12.7	11.4	8.1	5.7	4.6	4.0	3.6
95	34.5	24.4	19.9	17.3	15.5	10.9	7.7	6.3	5.5	4.9
120	43.6	30.9	25.2	21.8	19.5	13.8	9.8	8.0	6.9	6.2
150	54.5	38.6	31.5	27.3	24.4	17.3	12.2	10.0	8.6	7.7
185	67.3	47.6	38.8	33.6	30.1	21.3	15.0	12.3	10.6	9.5
240	87.3	61.7	50.4	43.6	39.0	27.6	19.5	15.9	13.8	12.3
300	109.1	77.1	63.0	54.5	48.8	34.5	24.4	19.9	17.3	15.4
400	130.0	91.9	75.1	65.0	58.2	41.1	29.1	23.7	20.6	18.4
500	162.5	114.9	93.8	81.3	72.7	51.4	36.3	29.7	25.7	23.0
630	204.8	144.8	118.2	102.4	91.6	64.8	45.8	37.4	32.4	29.0

Table 13

kA Short Circuit Current - Aluminium Conductor - PVC Insulated

C.S.A. mm²	Duration sec.									
	0.1	0.2	0.3	0.4	0.5	1.0	2.0	3.0	4.0	5.0
16	3.8	2.7	2.2	1.9	1.7	1.2	0.9	0.7	0.6	0.5
25	6.0	4.2	3.5	3.0	2.7	1.9	1.3	1.1	1.0	0.8
35	8.4	5.9	4.9	4.2	3.8	2.7	1.9	1.5	1.3	1.2
50	12.0	8.5	6.9	6.0	5.4	3.8	2.7	2.2	1.9	1.7
70	16.8	11.9	9.7	8.4	7.5	5.3	3.8	3.1	2.7	2.4
95	22.8	16.1	13.2	11.4	10.2	7.2	5.1	4.2	3.6	3.2
120	28.8	20.4	16.7	14.4	12.9	9.1	6.4	5.3	4.6	4.1
150	36.0	25.5	20.8	18.0	16.1	11.4	8.1	6.6	5.7	5.1
185	44.5	31.4	25.7	22.2	19.9	14.1	9.9	8.1	7.0	6.3
240	57.7	40.8	33.3	28.8	25.8	18.2	12.9	10.5	9.1	8.2
300	72.1	51.0	41.6	36.0	32.2	22.8	16.1	13.2	11.4	10.2
400	86.0	60.8	49.7	43.0	38.5	27.2	19.2	15.7	13.6	12.2
500	107.5	76.0	62.1	53.8	48.1	34.0	24.0	19.6	17.0	15.2
630	135.5	95.8	78.2	67.7	60.6	42.8	30.3	24.7	21.4	19.2

Table 14

kA Short Circuit Current - Copper Conductor - XLPE Insulated

C.S.A. mm²	Duration sec.									
	0.1	0.2	0.3	0.4	0.5	1.0	2.0	3.0	4.0	5.0
16	7.2	5.1	4.2	3.6	3.2	2.3	1.6	1.3	1.1	1.02
25	11.3	8.0	6.5	5.7	5.1	3.6	2.5	2.1	1.8	1.60
35	15.8	11.2	9.1	7.9	7.1	5.0	3.5	2.9	2.5	2.24
50	22.6	16.0	13.1	11.3	10.1	7.2	5.1	4.1	3.6	3.20
70	31.7	22.4	18.3	15.8	14.2	10.0	7.1	5.8	5.0	4.5
95	43.0	30.4	24.8	21.5	19.2	13.6	9.6	7.8	6.8	6.1
120	54.3	38.4	31.3	27.1	24.3	17.2	12.1	9.9	8.6	7.7
150	67.8	48.0	39.2	33.9	30.3	21.5	15.2	12.4	10.7	9.6
185	83.7	59.2	48.3	41.8	37.4	26.5	18.7	15.3	13.2	11.8
240	108.5	76.7	62.7	54.3	48.5	34.3	24.3	19.8	17.2	15.3
300	135.7	95.9	78.3	67.8	60.7	42.9	30.3	24.8	21.5	19.2
400	180.9	127.9	104.4	90.4	80.9	57.2	40.4	33.0	28.6	25.6
500	226.1	159.9	130.5	113.1	101.1	71.5	50.6	41.3	35.8	32.0
630	284.9	201.4	164.5	142.4	127.4	90.1	63.7	52.0	45.0	40.3
800	361.8	255.8	208.9	180.9	161.8	114.4	80.9	66.0	57.2	51.2
1000	452.2	319.8	261.1	226.1	202.2	143.0	101.1	82.6	71.5	64.0
1200	542.6	383.7	313.3	271.3	242.7	171.6	121.3	99.1	85.8	76.7
1600	723.5	511.6	417.7	361.8	323.6	228.8	161.8	132.1	114.4	102.3
2000	904.4	639.5	522.2	452.2	404.5	286.0	202.2	165.1	143.0	127.9
2500	1130.5	799.4	652.7	565.3	505.6	357.5	252.8	206.4	178.8	159.9

Short Circuit Current

Table 15

kA Short Circuit Current - Aluminium Conductor - XLPE Insulated

C.S.A. mm²	Duration Sec.									
	0.1	0.2	0.3	0.4	0.5	1.0	2.0	3.0	4.0	5.0
16	4.7	3.4	2.7	2.4	2.1	1.5	1.1	0.9	0.75	0.67
25	7.4	5.2	4.3	3.7	3.3	2.3	1.7	1.4	1.2	1.0
35	10.4	7.3	6.0	5.2	4.6	3.3	2.3	1.9	1.6	1.5
50	14.8	10.5	8.6	7.4	6.6	4.7	3.3	2.7	2.3	2.1
70	20.7	14.7	12.0	10.4	9.3	6.6	4.6	3.8	3.3	2.9
95	28.1	19.9	16.3	14.1	12.6	8.9	6.3	5.1	4.5	4.0
120	35.6	25.1	20.5	17.8	15.9	11.2	8.0	6.5	5.6	5.0
150	44.4	31.4	25.7	22.2	19.9	14.1	9.9	8.1	7.0	6.3
185	54.8	38.8	31.6	27.4	24.5	17.3	12.3	10.0	8.7	7.8
240	71.1	50.3	41.1	35.6	31.8	22.5	15.9	13.0	11.2	10.1
300	88.9	62.9	51.3	44.4	39.8	28.1	19.9	16.2	14.1	12.6
400	118.5	83.8	68.4	59.3	53.0	37.5	26.5	21.6	18.7	16.8
500	148.2	104.8	85.5	74.1	66.3	46.9	33.1	27.0	23.4	21.0
630	186.7	132.0	107.8	93.3	83.5	59.0	41.7	34.1	29.5	26.4
800	237.0	167.6	136.9	118.5	106.0	75.0	53.0	43.3	37.5	33.5
1000	296.3	209.5	171.1	148.2	132.5	93.7	66.3	54.1	46.9	41.9
1200	355.6	251.4	205.3	177.8	159.0	112.4	79.5	64.9	56.2	50.3
1600	474.1	335.2	273.7	237.0	212.0	149.9	106.0	86.6	75.0	67.0
2000	592.6	419.0	342.1	296.3	265.0	187.4	132.5	108.2	93.7	83.8
2500	741.2	524.1	427.9	370.6	331.5	234.4	165.7	135.3	117.2	104.8

Table 16

kA Short Circuit Current - Copper Screen

C.S.A. mm²	Duration Sec.									
	0.1	0.2	0.3	0.4	0.5	1.0	2.0	3.0	4.0	5.0
16	7.5	5.3	4.3	3.7	3.3	2.4	1.7	1.4	1.2	1.1
25	11.7	8.3	6.8	5.9	5.2	3.7	2.6	2.1	1.9	1.7
35	16.4	11.6	9.5	8.3	7.3	5.2	3.7	3.0	2.6	2.3

Conductor temperature before short circuit = 90 °C
Maximum conductor temperature during short circuit = 250 °C
Maximum screen temperature before short circuit = 80 °C

Voltage Drop

Table 17

Voltage Drop for Single Core LV Cables

C.S.A mm²	Copper Conductor Voltage Drop (mv / AMP / Meter)			
	PVC Insulation & PVC Sheathed		XLPE Insulation & PVC Sheathed	
	Flat	Trefoil	Flat	Trefoil
4	7.830	7.770	8.337	8.277
6	5.287	5.226	5.628	5.568
10	3.184	3.124	3.401	3.341
16	2.068	2.008	2.203	2.142
25	1.357	1.297	1.440	1.380
35	1.034	0.971	1.085	1.024
50	0.793	0.732	0.836	0.776
70	0.595	0.534	0.624	0.564
95	0.469	0.408	0.490	0.430
120	0.410	0.349	0.417	0.357
150	0.354	0.294	0.366	0.305
185	0.312	0.252	0.322	0.262
240	0.272	0.211	0.278	0.218
300	0.247	0.187	0.253	0.192
400	0.224	0.164	0.220	0.159
500	0.208	0.148	0.211	0.150
630	0.194	0.134	0.191	0.131

C.S.A mm²	Aluminium Conductor Voltage Drop (mv / AMP / Meter)			
	PVC Insulation & PVC Sheathed		XLPE Insulation & PVC Sheathed	
	Flat	Trefoil	Flat	Trefoil
16	3.343	3.283	3.561	3.500
25	2.161	2.100	2.296	2.235
35	1.602	1.542	1.700	1.640
50	1.222	1.162	1.291	1.230
70	0.890	0.830	0.937	0.877
95	0.686	0.623	0.719	0.655
120	0.569	0.509	0.594	0.534
150	0.490	0.430	0.511	0.451
185	0.420	0.360	0.437	0.377
240	0.353	0.293	0.367	0.307
300	0.312	0.252	0.322	0.262
400	0.274	0.214	0.278	0.218
500	0.245	0.185	0.260	0.199
630	0.222	0.162	0.223	0.163

The above data are based on:
- Max. operating temp: 90 °C for XLPE & 70 °C for PVC
- Power factor: 0.8 Rated frequency: 50 HZ
- Cables are touched in flat formation

Voltage Drop

Table 18
Voltage Drop for Multi Core LV Cables

C.S.A mm²	Copper Conductor Voltage Drop (mv / AMP / Meter)	
	PVC Insulation & PVC Sheathed	XLPE Insulation & PVC Sheathed
1.5	20.345	20.341
2.5	12.397	13.197
4	7.741	7.731
6	5.199	5.191
10	3.101	3.094
16	1.988	1.982
25	1.280	1.276
35	0.959	0.955
50	0.720	0.715
70	0.524	0.520
95	0.398	0.394
120	0.341	0.337
150	0.285	0.282
185	0.244	0.241
240	0.204	0.201
300	0.180	0.177
400	0.157	0.155

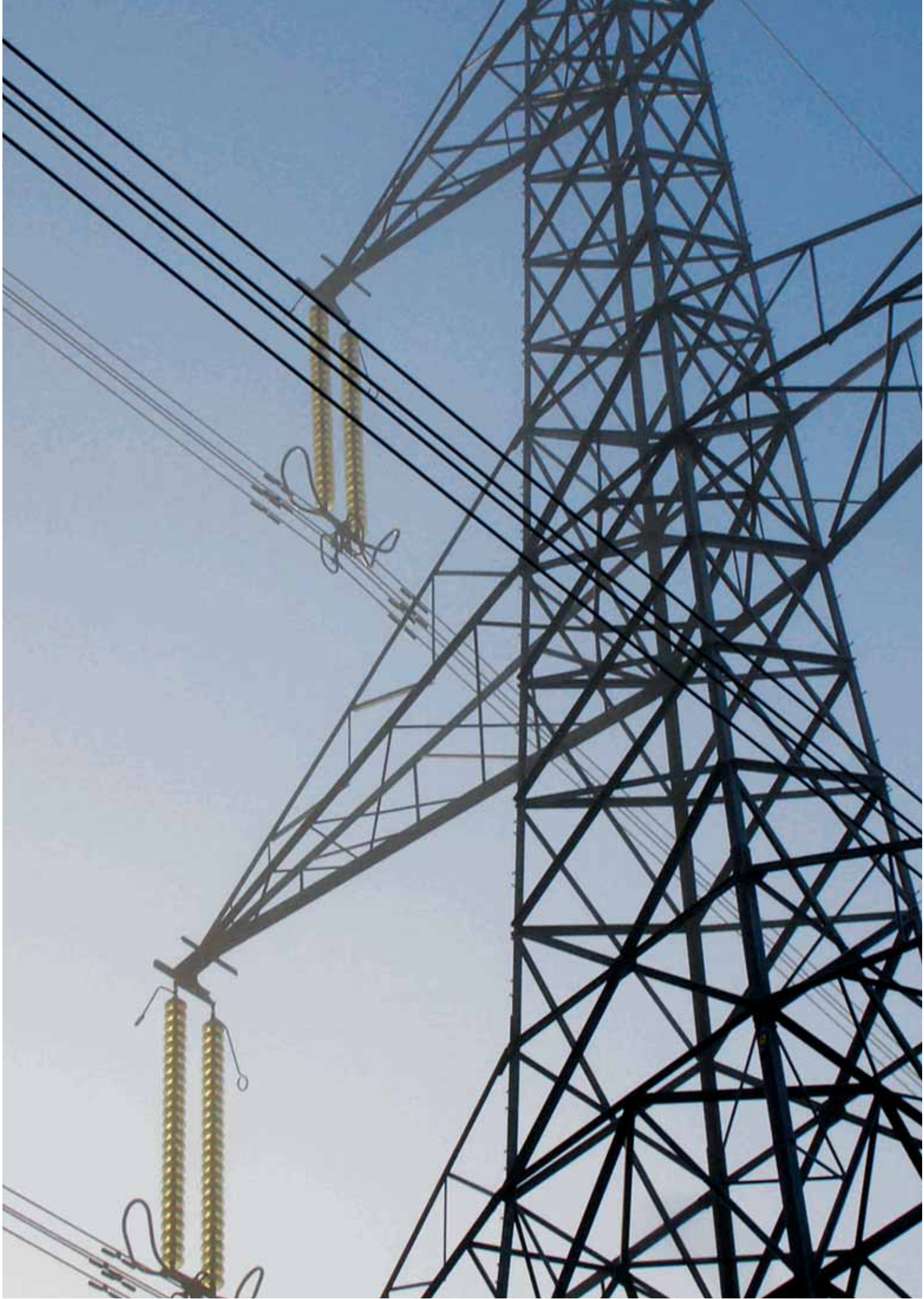
C.S.A mm²	Aluminium Conductor Voltage Drop (mv / AMP / Meter)	
	PVC Insulation & PVC Sheathed	XLPE Insulation & PVC Sheathed
16	3.263	3.479
25	2.084	2.218
35	1.527	1.624
50	1.150	1.217
70	0.819	0.865
95	0.613	0.645
120	0.500	0.524
150	0.421	0.442
185	0.352	0.369
240	0.286	0.299
300	0.245	0.255
400	0.208	0.211

The above data are based on:
Max. operating temp: 90 °C for XLPE & 70 °C for PVC
Power factor : 0.8 Rated frequency: 50 HZ
Cables are touched in flat formation

Conversion Table

Multiply	By	To obtain
Weight-Imperial		
Ounces	28.3495	grams
Pounds (Av)	453.59	grams
Pounds (Av)	0.45359	Kilograms
Tons (short)	907.19	Kilograms
Tons (long)	1016.05	Kilograms
Weight-Metric		
Grams	0.03527	Ounces
Grams	0.002205	Pounds
Kilograms	35.274	Ounces
Kilograms	2.2046	Pounds
Kilograms	0.001102	tons (short)
Kilograms	0.0009842	tons (long)
Miscellaneous-Imperial		
Pounds per 1000 feet	1.48816	Kg/Km
Pounds per mile	0.28185	Kg/Km
Pounds per square inch	0.0007031	Kg. per square mm.
Pounds per square inch	0.07031	Kg. per square cm.
Pounds per cubic	27.68	grams per cubic cm.
Feet per second	18.288	meters per minute.
Feet per second	1.09728	Kilometers per hour.
Miles per hour	1.60935	Kilometers per hour.
Ohms per 1000 feet	3.28083	ohms per Kilometer.
Ohms per mile	0.62137	ohms per Kilometer.
Decibels per 1000 feet	3.28083	decibels per Kilometer.
Decibels per mile	0.62137	decibels per Kilometer.
Decibels	0.1153	nepers.
Miscellaneous-Metric		
Kg/Km	0.67197	pounds per 1000 feet.
Kg/Km	3.54795	pounds per mile.
Kg.per square mm	1422.34	pounds per square inch.
Kg.per square cm	14.2234	pounds per square inch.
Grams per cubic cm	0.03613	pounds per cubic inch.
Meters per minute	0.05468	feet per second.
Kilometers per hour	0.91134	feet per second.
Kilometer per hour	0.62137	miles per hour.
Ohms per Kilometer	0.3048	ohms per 1000 feet.
Ohms per Kilometer	1.6093	ohms per mile.
Decibels per kilometer	0.3048	decibels per 1000 feet.
Decibels per kilometer	1.6093	decibels per mile.
Temperature		
° Fahrenheit	5/9(°F)-32	°Celsius
° Celsius	9/5(°C)+32	°Fahrenheit
Length-Imperial		
Mils	0.001	inches.
Mils	0.0254	mm.
Inches	1000	mils.

Multiply	By	To obtain
Inches	25.40	mm.
Inches	2.54	cm.
Feet	30.48	cm.
Feet	0.3048	meters.
Feet (thousands of)	0.3048	kilometers.
Yards	0.9144	meters.
Miles	1.6093	kilometers
Length-Metric		
Millimeters	39.37	mils.
Millimeters	0.03937	inches.
Centimeters	0.3937	inches.
Centimeters	0.032808	feet.
Meters	39.37	inches.
Meters	3.2808	feet.
Meters	1.0936	yards.
Kilometers	3280.83	feet.
Kilometers	0.62137	miles.
Area-Imperial		
Square mils	1.2732	circular mils
Square mils	0.000001	square inches
Circular mils	0.7854	square mils
Circular mils	0.0000007854	square inches
Square mils	0.0005067	square mm.
Square inches	1000000	square mils
Square inches	1273240	circualr mils
Square inches	645.16	square mm.
Square inches	6.4516	square cm.
Square feet	0.09290	square meters
Square yards	0.8361	square meters
Area-Metric		
Square millimeters	1973.52	circular mils
Square millimeters	0.00155	square inches
Square centimeters	0.155	square inches
Square meters	10.7638	square feet
Square meters	1.19599	square yards
Volume-Imperial		
Cubic inches	16.38716	cubic cm.
Cubic feet	0.028317	cubic meters
Volume-U.S.		
Quarts (liquid)	0.9463	liters
Gallons	3.7854	liters.
Volume-Metric		
Cubic cm	0.06102	cubic inches.
Cubic meters	35.3145	cubic feet.
Liters	1.05668	quarts (liquid U.S)
Liters	0.26417	gallons (U.S.)



2 OVERHEAD CONDUCTORS

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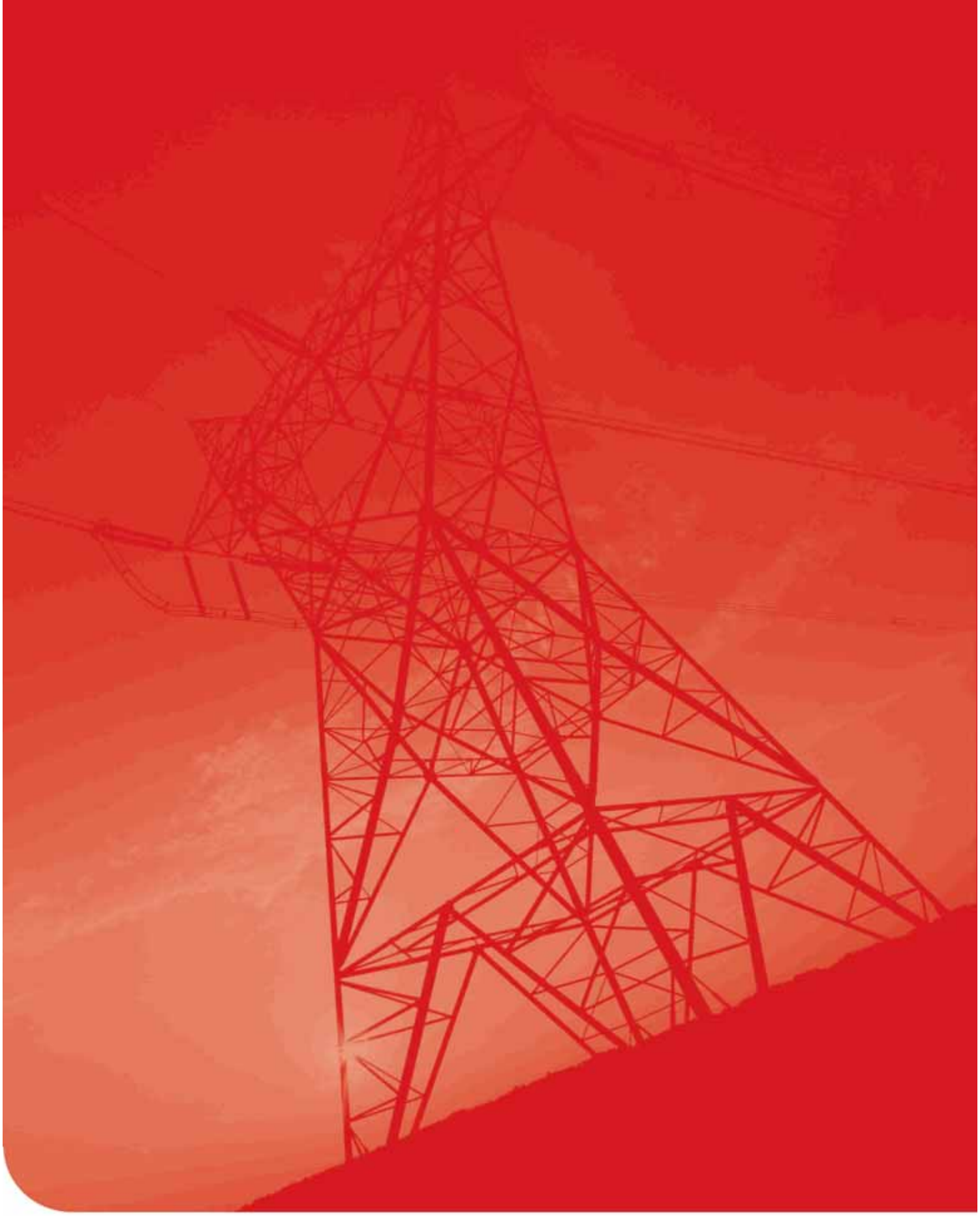


Product Types

1- Bare hard drawn Copper
2- All Aluminium conductor (A.A.C)
3- All Aluminium alloy conductor (A.A.A.C.)
4- Aluminium conductor steel reinforced (A.C.S.R)
5- Service drop cables.

Cable Construction

1. Conductor

Copper, Aluminium or Aluminium alloy conductors consist of wires concentrically applied in successive layers in opposite direction. In case of A.C.S.R conductor a core of solid or stranded galvanized steel is applied first.

2. Insulation

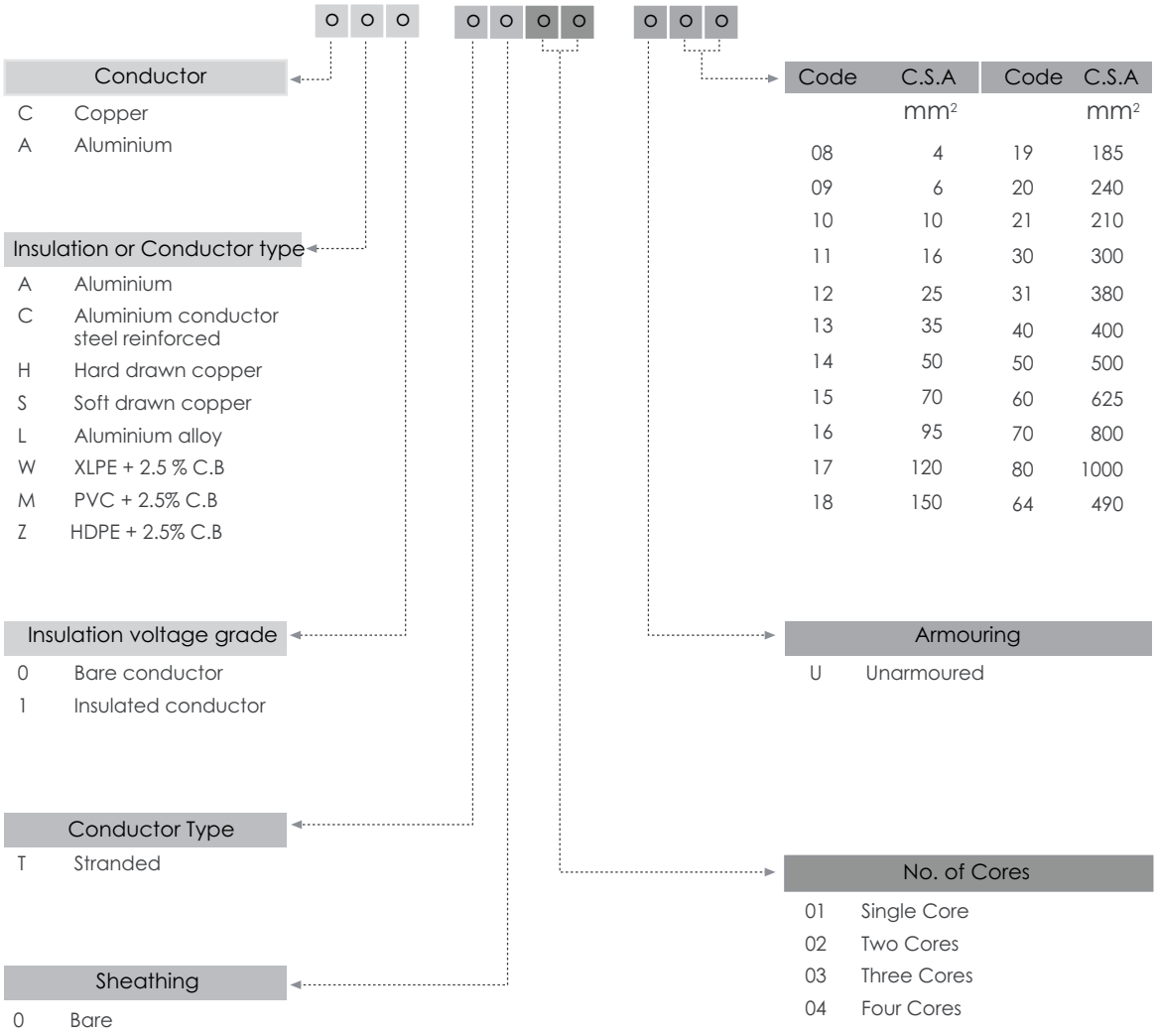
In case of service drop cables, an extruded layer of PVC or XLPE or HDPE with 2.5% of carbon black as UV protector is applied upon the conductor.

2.1

System Designation for Overhead Conductors

You can order our product by giving the following information:

1. Cable code as per the catalogue.
2. If your required cable/conductor is out of our catalogue range, you can use the following codes to determine your cable.



Code	C.S.A mm²	Code	C.S.A mm²
08	4	19	185
09	6	20	240
10	10	21	210
11	16	30	300
12	25	31	380
13	35	40	400
14	50	50	500
15	70	60	625
16	95	70	800
17	120	80	1000
18	150	64	490

Bare Soft and Hard Drawn Copper Stranded Conductors

Copper Conductors

Description

- Plain bare soft drawn Copper conductors as per IEC 60228 class 2.
- Plain bare hard drawn Copper conductors as per DIN 48201.

Application

- Soft drawn Copper conductors are used for grounding electrical systems, where high conductivity and flexibility are required.
- Hard drawn Copper conductors are used in overhead electrical distribution networks.

Product - Code	Nominal Cross Sectional Area	Number and Nominal Diameter of Wires	Max. DC. resistance at 20 °C	Approx. Overall Diameter	Approx. Weight
	mm^2	No x ø (mm)	Ω/km	mm	kg/km
		a - Bare soft drawn			
CS0-T001-U10	10	7 x 1.43	1.8300	3.7	86.5
CS0-T001-U11	16	7 x 1.75	1.1500	4.7	137
CS0-T001-U12	25	7 x 2.18	0.7270	5.8	217
CS0-T001-U13	35	7 x 2.65	0.5240	6.9	298
CS0-T001-U14	50	19 x 1.86	0.3870	8.2	410
CS0-T001-U15	70	19 x 2.16	0.2680	10.1	595
CS0-T001-U16	95	19 x 2.65	0.1930	11.3	820
CS0-T001-U17	120	19 x 3.05	0.1530	12.7	1040
CS0-T001-U18	150	19 x 3.38	0.1240	14.1	1277
CS0-T001-U19	185	37 x 2.63	0.0991	15.8	1610
CS0-T001-U20	240	34 x 3.23	0.0754	18.2	2120
CS0-T001-U30	300	61 x 2.64	0.0601	20.6	2630
CS0-T001-U40	400	61 x 2.98	0.0470	23.2	3390
CS0-T001-U50	500	61 x 3.33	0.0366	26.6	4420
		b - Bare hard drawn			
CH0-T001-U10	10	7 x 1.35	1.8290	4.1	90
CH0-T001-U11	16	7 x 1.70	1.1540	5.1	143
CH0-T001-U12	25	7 x 2.10	0.7563	6.3	218
CH0-T001-U13	35	7 x 2.50	0.5337	7.5	310
CH0-T001-U14	50	7 x 3.00	0.3706	9.0	446
CH0-T001-U14	50	19 x 1.80	0.3819	9.0	437
CH0-T001-U15	70	19 x 2.10	0.2806	10.5	596
CH0-T001-U16	95	19 x 2.50	0.1980	12.5	845
CH0-T001-U17	120	19 x 2.80	0.1578	14.0	1060
CH0-T001-U18	150	37 x 2.25	0.1264	15.8	1337
CH0-T001-U19	185	37 x 2.50	0.1024	17.5	1649
CH0-T001-U20	240	61 x 2.25	0.07528	20.3	2209
CH0-T001-U30	300	61 x 2.50	0.06097	22.5	2725
CH0-T001-U40	400	61 x 2.89	0.0456	26.0	3640
CH0-T001-U50	500	61 x 3.23	0.0365	29.1	4545

The above data is approximate and subjected to manufacturing tolerance.

All Aluminium Conductors (A.A.C.)

Description

- Hard drawn Aluminium wires, stranded in successive layers, in opposite direction to form the Aluminium stranded A.A.C. conductor. As per BS EN 50182 or IEC 61089.

Application

- All Aluminium bare conductors are used for aerial distribution lines having relatively short spans, aerial feeders and bus bars of substations.

Product - Code	Nominal Cross Sectional Area	Number and Nominal Diameters of Wires	Max. DC. Resistance at 20 °C	Rated Strength	Approx. Overall Diameter	Approx. Weight
	mm^2	No x ø (mm)	Ω/km	kN	mm	kg/km
		a - According to BS EN 50182 - Germany				
AA0-T001-U11	16	7 x 1.70	1.7986	3.02	5.10	43.4
AA0-T001-U12	25	7 x 2.10	1.1787	4.36	6.30	66.3
AA0-T001-U13	35	7 x 2.50	0.8317	6.01	7.50	93.9
AA0-T001-U14	50	7 x 3.00	0.5776	8.41	9.00	135.2
		19 x 1.80	0.5944	8.94	9.00	132.9
AA0-T001-U15	70	19 x 2.10	0.4367	11.85	10.5	180.9
AA0-T001-U16	95	19 x 2.50	0.3081	16.32	12.5	256.3
AA0-T001-U17	120	19 x 2.80	0.2456	19.89	14.0	321.5
AA0-T001-U18	150	37 x 2.25	0.1960	26.48	15.8	405.7
AA0-T001-U19	185	37 x 2.50	0.1588	31.78	17.5	500.9
AA0-T001-U20	240	61 x 2.25	0.1193	43.66	20.3	671.1
AA0-T001-U30	300	61 x 2.50	0.0966	52.40	22.5	828.5
AA0-T001-U40	400	61 x 2.89	0.0723	68.02	26.0	1107.1
AA0-T001-U50	500	61 x 3.23	0.0579	82.47	29.1	1382.9
AA0-T001-U60	625	91 x 2.96	0.0464	106.45	32.6	1739.7
AA0-T001-U70	800	91 x 3.35	0.0362	132.34	36.9	2228.3
AA0-T001-U80	1000	91 x 3.74	0.0291	159.95	41.1	2777.3

The above data is approximate and subjected to manufacturing tolerance.

All Aluminium Conductors (A.A.C.)

Name	Nominal Cross Sectional Area	Number and Nominal Diameters of Wires	Max. DC. Resistance at 20 °C	Rated Strength	Approx. Overall Diameter	Approx. Weight
	mm^2	No x ø (mm)	Ω/km	kN	mm	kg/km
b - According to BS EN 50182 - United Kingdom						
MIDGE	23.3	7 x 2.06	1.2249	4.20	6.18	63.8
GNAT	26.9	7 x 2.21	1.0643	4.83	6.63	73.4
MOSQUITO	36.9	7 x 2.59	0.7749	6.27	7.77	100.8
LADYBIRD	42.8	7 x 2.79	0.6678	7.28	8.37	117.0
ANT	52.8	7 x 3.10	0.5409	8.72	9.30	144.4
FLY	63.6	7 x 3.40	0.4497	10.49	10.2	173.7
BLUEBOTTLE	73.6	7 x 3.66	0.3880	11.78	11.0	201.3
EARWIG	78.6	7 x 3.78	0.3638	12.57	11.3	214.7
GRASSHOPPER	84.1	7 x 3.91	0.3400	13.45	11.7	229.7
CLEGG	95.6	7 x 4.17	0.2989	15.30	12.5	261.3
WASP	106.0	7 x 4.39	0.2697	16.95	13.2	289.6
BEETLE	106.4	19 x 2.67	0.2701	18.08	13.4	292.4
BEE	132.0	7 x 4.90	0.2165	21.12	14.7	360.8
HORNET	157.6	19 x 3.25	0.1823	26.01	16.3	433.2
CATERPILLAR	185.9	19 x 3.53	0.1546	29.75	17.7	511.1
CHAFER	213.2	19 x 3.78	0.1348	34.12	18.9	586.0
SPIDER	237.6	19 x 3.99	0.1210	38.01	20.0	652.9
COCKROACH	265.7	19 x 4.22	0.1081	42.52	21.1	730.4
BUTTERFLY	322.7	19 x 4.65	0.0891	51.63	23.3	886.8
MOTH	373.1	19 x 5.00	0.0770	59.69	25.0	1025.3
DRONE	372.4	37 x 3.58	0.0774	59.59	25.1	1027.1
CENTIPEDE	415.2	37 x 3.78	0.0695	66.43	26.5	1145.1
MAYBUG	486.1	37 x 4.09	0.0593	77.78	28.6	1340.6
SCORPION	529.8	37 x 4.27	0.0544	84.77	29.9	1461.2
CICADA	628.3	37 x 4.65	0.0459	100.54	32.6	1732.9

The above data is approximate and subjected to manufacturing tolerance.

All Aluminium Alloy Conductors (A.A.A.C.)

Description

- All Aluminium alloy (ALMELEC) conductors, stranded in successive layers to form the stranded A.A.A.C. conductor. As per IEC 61089 or BS EN 50182 or ASTM B 399.

Application

- A.A.A.C. are mainly used for overhead lines, in transmission and distribution electrical networks, having relatively long spans. They are also used a messenger to support overhead electrical cables.

Product - Code	Nominal Cross Sectional Area	Number and Nominal Diameters of Wires	Max. DC. Resistance at 20 °C	Rated Strength	Approx. Overall Diameter	Approx. Weight
	mm^2	No x ø (mm)	Ω/km	kN	mm	kg/km
		a - According to BS EN 50182 - Germany				
AL0-T001-U11	16	7 x 1.70	2.0701	4.69	5.10	43.4
AL0-T001-U12	25	7 x 2.10	1.3566	7.15	6.30	66.2
AL0-T001-U13	35	7 x 2.50	0.9572	10.14	7.50	93.8
AL0-T001-U14	50	7 x 3.00	0.6647	14.60	9.00	135.1
	50	19 x 1.80	0.6841	14.26	9.00	132.7
AL0-T001-U15	70	19 x 2.10	0.5026	19.41	10.50	180.7
AL0-T001-U16	95	19 x 2.50	0.3546	27.51	12.50	256.0
AL0-T001-U17	120	19 x 2.80	0.2827	34.51	14.00	321.2
AL0-T001-U18	150	37 x 2.25	0.2256	43.40	15.80	405.3
AL0-T001-U19	185	37 x 2.50	0.1827	53.58	17.50	500.3
AL0-T001-U20	240	61 x 2.25	0.1373	71.55	20.30	670.3
AL0-T001-U30	300	61 x 2.50	0.1112	88.33	22.50	827.5
AL0-T001-U40	400	61 x 2.89	0.0832	118.04	26.00	1105.9
AL0-T001-U50	500	61 x 3.23	0.0666	147.45	29.10	1381.4
AL0-T001-U60	625	91 x 2.96	0.0534	184.73	32.60	1737.7
AL0-T001-U70	800	91 x 3.35	0.0417	236.62	36.90	2225.8
AL0-T001-U80	1000	91 x 3.74	0.0334	294.91	41.10	2774.3

The above data is approximate and subjected to manufacturing tolerance.

All Aluminium Alloy Conductors (A.A.A.C.)

Name	Nominal Cross Sectional Area	Number and Nominal Diameters of Wires	Max. DC. Resistance at 20 °C	Rated Strength	Approx. Overall Diameter	Approx. Weight
	mm^2	No x ø (mm)	Ω/km	kN	mm	kg/km
b - According to BS EN 50182 - United Kingdom						
BOX	18.8	7 x 1.85	1.7480	5.55	5.55	51.4
ACACIA	23.8	7 x 2.08	1.3828	7.02	6.24	64.9
ALMOND	30.1	7 x 2.34	1.0926	8.88	7.02	82.2
CEDAR	35.5	7 x 2.54	0.9273	10.46	7.62	96.8
DEODAR	42.2	7 x 2.77	0.7797	12.44	8.31	115.2
FIR	47.8	7 x 2.95	0.6875	14.11	8.85	130.6
HAZEL	59.9	7 x 3.30	0.5494	17.66	9.90	163.4
PINE	71.6	7 x 3.61	0.4591	21.14	10.8	195.6
HOLLY	84.1	7 x 3.91	0.3913	24.79	11.7	229.5
WILLOW	89.7	7 x 4.04	0.3665	26.47	12.1	245.0
OAK	118.9	7 x 4.65	0.2767	35.07	14.0	324.5
MULBERRY	150.9	19 x 3.18	0.2192	44.52	15.9	414.3
ASH	180.7	19 x 3.48	0.1830	53.31	17.4	496.1
ELM	211.0	19 x 3.76	0.1568	62.24	18.8	579.2
POPLAR	239.4	37 x 2.87	0.1387	70.61	20.1	659.4
SYCAMORE	303.2	37 x 3.23	0.1095	89.40	22.6	835.2
UPAS	362.1	37 x 3.53	0.0917	106.82	24.7	997.5
YEW	479.0	37 x 4.06	0.0693	141.31	28.4	1319.6
TOTARA	498.1	37 x 4.14	0.0666	146.93	29.0	1372.1
RUBUS	586.9	61 x 3.50	0.0567	173.13	31.5	1622.0
SORBUS	659.4	61 x 3.71	0.0505	194.53	33.4	1822.5
ARAUCARIA	821.1	61 x 4.14	0.0406	242.24	37.3	2269.4
REDWOOD	996.2	61 x 4.56	0.0334	293.88	41.0	2753.2

The above data is approximate and subjected to manufacturing tolerance.

Aluminium Conductor Steel Reinforced (A.C.S.R.)

Description

- An outer layer of Aluminium conductor concentrically stranded over the central core of galvanized solid or stranded steel wires to form Aluminium steel reinforced conductor. As per BS EN 50182 or ASTM B 232 or IEC 61089.

Application

- A.C.S.R conductors are widely used for electrical power transmission over long distances, since they are ideal for long overhead lines spans. They are also used as a messenger for supporting overhead electrical cables.

Product - Code	Nominal Cross Sectional Area	Number and Nominal Diameters of Wires		Max. DC. Resistance at 20 °C	Rated Strength	Approx. Overall Diameter	Approx. Weight
		Aluminium	Steel				
	mm^2	No x ø (mm)	No x ø (mm)	Ω/km	kN	mm	kg/km
a - According to BS EN 50182 - Germany							
AC0-T001-U11	16/2.5	6 x 1.80	1 x 1.80	1.8769	5.80	5.4	61.6
AC0-T001-U12	25/4	6 x 2.25	1 x 2.25	1.2012	8.95	6.75	96.3
AC0-T001-U13	35/6	6 x 2.70	1 x 2.70	0.8342	12.37	8.1	138.7
AC0-T001-U14	50/8	6 x 3.20	1 x 3.20	0.5939	16.81	9.6	194.8
AC0-T001-U15	70/12	26 x 1.85	7 x 1.44	0.4132	26.27	11.7	282.2
AC0-T001-U16	95/15	26 x 2.15	7 x 1.67	0.3060	34.93	13.6	380.6
AC0-T001-U17	120/20	26 x 2.44	7 x 1.90	0.2376	44.50	15.5	491.0
AC0-T001-U18	150/25	26 x 2.70	7 x 2.10	0.1940	53.67	17.1	600.8
AC0-T001-U19	185/30	26 x 3.00	7 x 2.33	0.1571	65.27	19.0	741.0
AC0-T001-U21	210/35	26 x 3.20	7 x 2.49	0.1381	73.36	20.3	844.1
AC0-T001-U20	240/40	26 x 3.45	7 x 2.68	0.1188	85.12	21.8	980.1
AC0-T001-U31	380/50	54 x 3.00	7 x 3.00	0.0758	121.30	27.0	1442.5
AC0-T001-U64	490/65	54 x 3.40	7 x 3.40	0.0590	150.81	30.6	1852.9

The above data is approximate and subjected to manufacturing tolerance.

cont'd

Aluminium Conductor Steel Reinforced (A.C.S.R.)

Name	Nominal Cross Sectional Area	Number and Nominal Diameters of Wires		Max. DC. Resistance at 20 °C	Rated Strength	Approx. Overall Diameter	Approx. Weight
		Aluminium	Steel				
	mm^2	No x ø (mm)	No x ø (mm)	Ω/km	kN	mm	kg/km
b - According to BS EN 50182 - United Kingdom							
MOLE	12.4	6 x 1.50	1 x 1.50	2.7027	4.14	4.50	42.8
SQUIRREL	24.5	6 x 2.11	1 x 2.11	1.3659	7.87	6.33	84.7
GOPHER	30.6	6 x 2.36	1 x 2.36	1.0919	9.58	7.08	106.0
WEASEL	36.9	6 x 2.59	1 x 2.59	0.9065	11.38	7.77	127.6
FOX	42.8	6 x 2.79	1 x 2.79	0.7812	13.21	8.37	148.1
FERRET	49.5	6 x 3.00	1 x 3.00	0.6757	15.27	9.00	171.2
RABBIT	61.7	6 x 3.35	1 x 3.35	0.5419	18.42	10.1	213.5
MINK	73.6	6 x 3.66	1 x 3.66	0.4540	21.67	11.0	254.9
SKUNK	100.1	12 x 2.59	7 x 2.59	0.4568	52.79	13.0	463.0
BEAVER	87.5	6 x 3.99	1 x 3.99	0.3820	25.76	12.0	302.9
HORSE	116.2	12 x 2.79	7 x 2.79	0.3936	61.26	14.0	537.3
RACOON	92.0	6 x 4.09	1 x 4.09	0.3635	27.06	12.3	318.3
OTTER	97.9	6 x 4.22	1 x 4.22	0.3415	28.81	12.7	338.8
CAT	111.3	6 x 4.50	1 x 4.50	0.3003	32.76	13.5	385.3
HARE	122.5	6 x 4.72	1 x 4.72	0.2730	36.04	14.2	423.8
DOG	118.5	6 x 4.72	7 x 1.57	0.2733	32.65	14.2	394.0
COYOTE	151.8	26 x 2.54	7 x 1.91	0.2192	45.86	15.9	520.7
COUGAR	138.8	18 x 3.05	1 x 3.05	0.2188	29.74	15.3	418.8
TIGER	161.9	30 x 2.36	7 x 2.36	0.2202	57.87	16.5	602.2
WOLF	194.9	30 x 2.59	7 x 2.59	0.1829	68.91	18.1	725.3
DINGO	167.5	18 x 3.35	1 x 3.35	0.1814	35.87	16.8	505.2
LYNX	226.2	30 x 2.79	7 x 2.79	0.1576	79.97	19.5	841.6
CARACAL	194.5	18 x 3.61	1 x 3.61	0.1562	40.74	18.1	586.7
PANTHER	261.5	30 x 3.00	7 x 3.00	0.1363	92.46	21.0	973.1
JAGUAR	222.3	18 x 3.86	1 x 3.86	0.1366	46.57	19.3	670.8
LION	293.9	30 x 3.18	7 x 3.18	0.1213	100.47	22.3	1093.4
BEAR	326.1	30 x 3.35	7 x 3.35	0.1093	111.50	23.5	1213.4
GOAT	400.0	30 x 3.71	7 x 3.71	0.0891	135.13	26.0	1488.2
SHEEP	462.6	30 x 3.99	7 x 3.99	0.0771	156.30	27.9	1721.3
ANTELOPE	422.6	54 x 2.97	7 x 2.97	0.0773	118.88	26.7	1413.8
BISON	431.2	54 x 3.00	7 x 3.00	0.0758	121.30	27.0	1442.5
DEER	529.8	30 x 4.27	7 x 4.27	0.0673	179.00	29.9	1971.4
ZEBRA	484.5	54 x 3.18	7 x 3.18	0.0674	131.92	28.6	1620.8
ELK	588.5	30 x 4.50	7 x 4.50	0.0606	198.80	31.5	2189.5
CAMEL	538.7	54 x 3.35	7 x 3.35	0.0608	146.40	30.2	1798.8
MOOSE	597.0	54 x 3.53	7 x 3.53	0.0547	159.92	31.8	1997.3

The above data is approximate and subjected to manufacturing tolerance.

cont'd

Aluminium Conductor Steel Reinforced (A.C.S.R.)

Name	Nominal Cross Sectional Area	Number and Nominal Diameters of Wires		Calculated DC Resistance at 20 °C	Calculated Rated Tensile Strength	Approx. Overall Diameter	Approx. Weight	
		Aluminium	Steel				Aluminium	Steel
	mm^2	No x ø (mm)	No x ø (mm)	Ω/km	kN	mm	kg/km	kg/km
			c - According to ASTM B 232					
GROUSE	40.5	8 X 2.54	1 X 4.24	0.7112	23.1	9.3	112	110
PETREL	51.6	12 X 2.34	7 X 2.34	0.5614	46.2	11.7	143	235
MINORCA	56.1	12 x 2.44	7 x 2.44	0.5163	50.2	12.2	156	256
LEGHORN	68.2	12 x 2.69	7 x 2.69	0.4248	60.7	13.5	189	311
GUINEA	80.4	12 x 2.92	7 x 2.92	0.3605	71.1	14.6	223	367
DOTTEREL	89.4	12 x 3.08	7 x 3.08	0.3240	76.7	15.4	248	409
DORKING	96.5	12 x 3.20	7 x 3.20	0.3002	82.8	16.0	268	441
BRAHMA	102.8	16 x 2.86	19 x 2.48	0.2819	126.5	18.1	285	722
COCHIN	107.1	12 x 3.37	7 x 3.37	0.2707	91.8	16.9	297	488
TURKEY	13.3	6 x 1.68	1 x 1.68	2.1570	5.3	5.0	36	17
SWAN	21.2	6 x 2.12	1 x 2.12	1.3545	8.3	6.4	58	27
SWANATE	21.1	7 x 1.96	1 x 2.61	1.3583	10.5	6.5	58	42
SPARROW	33.6	6 x 2.67	1 x 2.67	0.8530	12.7	8.0	92	44
SPARATE	33.5	7 x 2.47	1 x 3.30	0.8553	16.1	8.3	92	67
ROBIN	42.4	6 x 3.00	1 x 3.00	0.6764	15.8	9.0	117	55
RAVEN	53.5	6 x 3.37	1 x 3.37	0.5364	19.5	10.1	147	69
QUAIL	67.4	6 x 3.78	1 x 3.78	0.4255	23.6	11.4	185	87
PIGEON	85.1	6 x 4.25	1 x 4.25	0.3370	29.5	12.7	233	110
PENGUIN	107.2	6 x 4.77	1 x 4.77	0.2676	37.1	14.3	294	139
WAXWING	135.0	18 x 3.09	1 x 3.09	0.2133	30.3	15.5	373	59
PARTRIDGE	134.9	26 x 2.57	7 x 2.00	0.2142	50.2	16.3	373	172
OSTRICH	152.2	26 x 2.73	7 x 2.12	0.1906	56.6	17.3	421	193
MERLIN	170.2	18 x 3.47	1 x 3.47	0.1692	38.2	17.4	470	74
LINNET	170.6	26 x 2.89	7 x 2.25	0.1699	62.8	18.3	472	217
ORIOLE	170.5	30 x 2.69	7 x 2.69	0.1704	77.4	18.8	473	311
CHICKADEE	200.9	18 x 3.77	1 x 3.77	0.1432	44.3	18.9	555	87
BRANT	201.6	24 x 3.27	7 x 2.18	0.1437	64.7	19.6	558	204
IBIS	201.3	26 x 3.14	7 x 2.44	0.1438	72.1	19.9	558	256
LARK	200.9	30 x 2.92	7 x 2.92	0.1442	88.7	20.5	559	367
PELICAN	242.3	18 x 4.14	1 x 4.14	0.1193	52.3	20.7	667	105
FLICKLER	241.6	24 x 3.58	7 x 2.39	0.1199	76.8	21.5	670	245
HAWK	241.7	26 x 3.44	7 x 2.67	0.1199	86.4	21.8	670	308
HEN	241.3	30 x 3.20	7 x 3.20	0.1202	105.9	22.4	672	440
OSPREY	282.5	18 x 4.47	1 x 4.47	0.1022	61.0	22.3	777	122
PARAKEET	282.3	24 x 3.87	7 x 2.58	0.1026	88.3	23.2	782	285
DOVE	282.6	26 x 3.72	7 x 2.89	0.1025	101.1	23.5	781	359
EAGLE	282.1	30 x 3.46	7 x 3.46	0.1030	122.9	24.2	783	514
PEACOCK	306.1	24 X 4.03	7 X 2.69	0.0945	95.9	24.2	850	311
SQUAB	305.8	26 X 3.87	7 X 3.01	0.0945	108.1	24.5	849	390
WOOD DUCK	307.1	30 x 3.61	7 x 3.61	0.0947	129.0	25.3	851	559
TEAL	307.1	30 x 3.61	19 x 2.16	0.0947	133.4	25.3	851	547
SWIFT	323.0	36 x 3.38	1 x 3.38	0.0893	60.7	23.7	888	70
KINGBIRD	323.0	18 x 4.78	1 x 4.78	0.0894	69.7	23.9	889	139
ROOK	323.1	24 x 4.14	7 x 2.76	0.0899	101.0	24.8	893	326

The above data is approximate and subjected to manufacturing tolerance.

cont'd

Aluminium Conductor Steel Reinforced (A.C.S.R.)

Name	Nominal Cross Sectional Area	Number and Nominal Diameters of Wires		Calculated DC Resistance at 20 °C	Calculated Rated Tensile Strength	Approx. Overall Diameter	Approx. Weight	
		Aluminium	Steel				Aluminium	Steel
	mm^2	No x ø (mm)	No x ø (mm)	Ω/km	kN	mm	kg/km	kg/km
			c - According to ASTM B 232					
GROSBEAK	321.8	26 x 3.97	7 x 3.09	0.0900	111.9	25.2	893	409
SCOTER	322.6	30 x 3.70	7 x 3.70	0.0900	135.5	25.9	895	588
EGRET	322.6	30 x 3.70	19 x 2.22	0.0900	140.6	25.9	895	575
FLAMINGO	337.3	24 x 4.23	7 x 2.82	0.0859	105.5	25.4	936	342
GANNET	338.3	26 x 4.07	7 x 3.16	0.0857	117.3	25.8	936	429
STILT	363.3	24 x 4.39	7 x 2.92	0.0798	113.3	26.3	1005	367
STARLING	361.9	26 x 4.21	7 x 3.28	0.0800	126.0	26.7	1004	461
REDWING	362.1	30 x 3.92	19 x 2.35	0.0801	154.0	27.5	1006	646
CUCKOO	402.3	24 x 4.62	7 x 3.08	0.0720	124.5	27.7	1116	408
DRAKE	402.6	26 x 4.44	7 x 3.45	0.0720	139.7	28.1	1117	511
TERN	403.8	45 x 3.38	7 x 2.25	0.0720	97.5	27.0	1115	217
COOT	401.9	36 x 3.77	1 x 3.77	0.0717	74.7	26.4	1111	87
CONDOR	402.3	54 x 3.08	7 x 3.08	0.0720	124.3	27.7	1115	407
MALLARD	403.8	30 x 4.14	19 x 2.48	0.0721	171.2	29.0	1119	718
RUDDY	455.5	45 x 3.59	7 x 2.40	0.0636	109.4	28.7	1263	246
CANARY	456.3	54 x 3.28	7 x 3.28	0.0635	141.0	29.5	1263	461
RAIL	483.8	45 x 3.70	7 x 2.47	0.0599	116.1	29.6	1339	261
CATBIRD	484.6	36 x 4.14	1 x 4.14	0.0595	87.9	29.0	1335	105
CARDINAL	484.5	54 x 3.38	7 x 3.38	0.0599	149.7	30.4	1338	490
ORTLAN	523.9	45 x 3.85	7 x 2.57	0.0553	123.3	30.8	1450	283
TANAGER	522.8	36 x 4.30	1 x 4.30	0.0551	94.8	30.1	1444	113
CURLEW	522.5	54 x 3.51	7 x 3.51	0.0553	161.8	31.6	1450	529
BLUEJAY	565.5	45 x 4.00	7 x 2.66	0.0513	132.7	32.0	1562	304
FINCH	565.0	54 x 3.65	19 x 2.19	0.0516	174.6	32.8	1571	558
BUNTING	605.8	45 x 4.14	7 x 2.76	0.0479	142.4	33.1	1674	326
GRAKCLE	602.8	54 x 3.77	19 x 2.27	0.0483	186.9	34.0	1681	599
BITTERN	644.4	45 x 4.27	7 x 2.85	0.0450	151.6	34.2	1786	348
PHEASANT	645.1	54 x 3.90	19 x 2.34	0.0452	194.1	35.1	1795	639
SKYLARK	643.3	36 x 4.77	1 x 4.77	0.0448	116.7	33.4	1777	140
DIPPER	684.2	45 X 4.40	7 X 2.93	0.0423	160.7	35.2	1897	370
MARTIN	685.4	54 X 4.02	19 x 2.41	0.0425	206.1	36.2	1906	679
BOBOLINK	725.2	45 x 4.53	7 x 3.02	0.0399	170.5	36.3	2010	392
PLOVER	726.9	54 x 4.14	19 x 2.48	0.0401	218.4	37.2	2019	719
NUTHATCH	746.2	45 x 4.65	7 x 3.10	0.0379	177.6	37.2	2120	413
PARROT	766.1	54 x 4.25	19 x 2.55	0.0380	230.5	38.2	2129	758
LAPWING	807.5	45 x 4.77	7 x 3.18	0.0359	187.4	38.2	2232	435
FALCON	806.2	54 x 4.36	19 x 2.62	0.0361	243.0	39.2	2242	799

The above data is approximate and subjected to manufacturing tolerance.

Copper Conductors, XLPE Insulated

Description

- They are composed of one or more insulated conductors and one neutral (bare or insulated) conductor. They are required as two (Duplex) or three (Triplex) or four (Quadru-plex) conductors, XLPE with 2.5 % Carbon black insulated.
- As per NEMA WC 7/IEC60228.

Application

- They are used for secondary over head lines (in circuits not exceeding 600 volts phase to phase) on poles or as feeders to residential premises.

Copper conductors with bare neutral adopted from IEC 60228.

Product - code	Phase		Max. DC. resistance at 20 °C	Approx. overall diameter	Approx. weight
	Nominal cross sectional area	Insulation thickness			
	mm^2	mm	Ω/km	mm	kg/km
Two conductors (Duplex)					
CW1-T002-U10	10	1.2	1.830	10.7	198
CW1-T002-U11	16	1.2	1.150	12.8	307
CW1-T002-U12	25	1.2	0.727	15.3	469
CW1-T002-U13	35	1.2	0.524	17.6	650
CW1-T002-U14	50	1.5	0.387	21.2	898
CW1-T002-U15	70	1.5	0.268	24.5	1247
CW1-T002-U16	95	1.5	0.193	28.3	1736
CW1-T002-U17	120	1.7	0.153	31.8	2170
Three conductors (Triplex)					
CW1-T003-U10	10	1.2	1.830	13.7	305
CW1-T003-U11	16	1.2	1.150	15.8	471
CW1-T003-U12	25	1.2	0.727	18.5	719
CW1-T003-U13	35	1.2	0.524	20.7	991
CW1-T003-U14	50	1.5	0.387	25.0	1357
CW1-T003-U15	70	1.5	0.268	28.7	1900
CW1-T003-U16	95	1.5	0.193	32.4	2631
CW1-T003-U17	120	1.7	0.153	36.6	3285
Four conductors (Quadruplex)					
CW1-T004-U10	10	1.2	1.830	16.3	413
CW1-T004-U11	16	1.2	1.150	18.8	634
CW1-T004-U12	25	1.2	0.727	22.0	970
CW1-T004-U13	35	1.2	0.524	24.6	1332
CW1-T004-U14	50	1.5	0.387	29.8	1821
CW1-T004-U15	70	1.5	0.268	34.2	2553
CW1-T004-U16	95	1.5	0.193	38.6	3526
CW1-T004-U17	120	1.7	0.153	43.5	4579

The above data is approximate and subjected to manufacturing tolerance.

Aluminium Conductors, XLPE Insulated

Description

- They are composed of one or more insulated conductors and one neutral (bare or insulated) conductor. They are required as two (Duplex) or three (Triplex) or four (Quadruplex) conductors,XLPE with 2.5 % Carbon black insulated.
- As per NEMA WC 7/IEC60228.

Application

- They are used for secondary over head lines (in circuits not-exceeding 600 volts phase to phase) on poles or as feeders to residential premises.

Aluminium conductors with bare neutral adopted from IEC 60228.

Product - code	Phase		Max. DC. resistance at 20 °C	Approx. overall diameter	Approx. weight
	Nominal cross sectional area	Insulation thickness			
	mm²	mm	Ω/km	mm	kg/km
	Two conductors (Duplex)				
AW1-T002-U11	16	1.2	1.910	12.9	115
AW1-T002-U12	25	1.2	1.200	15.3	168
AW1-T002-U13	35	1.2	0.868	17.7	229
AW1-T002-U14	50	1.5	0.641	21.4	322
AW1-T002-U15	70	1.5	0.443	24.4	428
AW1-T002-U16	95	1.5	0.320	28.4	626
AW1-T002-U17	120	1.7	0.253	31.8	734
	Three conductors (Triplex)				
AW1-T003-U11	16	1.2	1.910	15.6	185
AW1-T003-U12	25	1.2	1.200	18.0	267
AW1-T003-U13	35	1.2	0.868	20.4	364
AW1-T003-U14	50	1.5	0.641	25.2	519
AW1-T003-U15	70	1.5	0.443	28.2	674
AW1-T003-U16	95	1.5	0.320	32.2	928
AW1-T003-U17	120	1.7	0.253	36.6	1245
	Four conductors (Quadruplex)				
AW1-T004-U11	16	1.2	1.910	19.0	256
AW1-T004-U12	25	1.2	1.200	22.0	367
AW1-T004-U13	35	1.2	0.868	24.9	499
AW1-T004-U14	50	1.5	0.641	30.3	710
AW1-T004-U15	70	1.5	0.443	33.9	920
AW1-T004-U16	95	1.5	0.320	38.8	1263
AW1-T004-U17	120	1.7	0.253	43.5	1556

The above data is approximate and subjected to manufacturing tolerance.

2.2 OPTICAL GROUND WIRE (OPGW)

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2.2

Single Stranding Layer, Central SST OPGW

SM-MFOA 45 29-3 26-1S ACS-24SMF

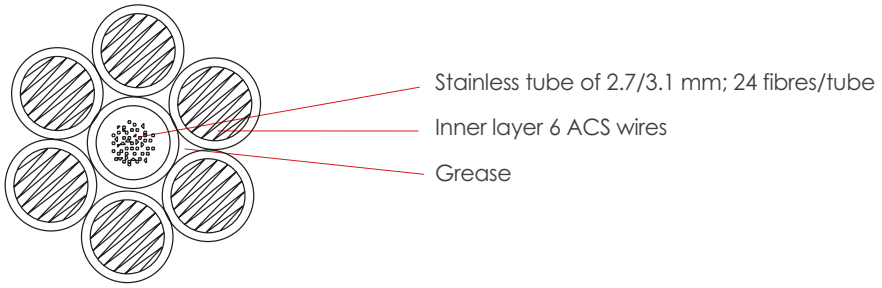
Application

These cables are suitable for installation as optical ground wire in powerline installations. The cable acts as an normal ground wire protecting phase wires from lighting strikes and carries earth fault currents. The cable provides also an optic path in powerline installations for telecommunication needs.

Features

- Installation in the same way as normal ground wire with conventional machinery.
- Most reliable optic solution for fibre optic utilities.
- Best solution in old ground wire replacement and in new line constructions.
- Low cost.

Cross Sectional Diagram



Construction

Optical fibre : For fibre specification see optical characteristics.

Secondary coating : The secondary coating consists of one laser welded stainless steel tube. Every fibre is uniquely identified by a fibre colour and for fibre counts above 12 fibres with a coloured fibre bundle yarn. The tube is filled with a water-repellent filling compound.

Central element : 1 stainless steel tube : 3.1 mm

First layer : 6 ACS wires (20SA) : 3.1 mm
: Direction layer : "Right "

Grease : The interstices of the cable core are filled with grease according to BS EN 50182 ANNEX B figure B.1-d

All values in this product data sheet are nominal unless otherwise stated.

Technical Characteristics

Number of tubes	1	
Number of fibres / tube	24	
Cable ø	9.3	mm
Cable weight	326	kg/km
Supporting cross-section	45.29	mm^2
ACS cross-section	45.29	mm^2
Calculated breaking load (UTS)	54.61	kN
Modulus of elasticity	161.99	kN/mm^2

Other types can be provided upon specified request.

DOHA CABLES

Coefficient of thermal expansion .10^{-6}	13	1/K
Permissible tensile stress acc.		
Everyday stress	192.9	N/mm^2
Maximum tensile stress	506.4	N/mm^2
Endurance tensile stress	868.2	N/mm^2
Nominal short-time current IEC 724 at		
Initial/Final temperature 200 °C (initial 50 °C)	3.26	kA, 1 s.
D.C. resistance at 20 °C	1.87	Ω/km
Transport, storage, operation	- 40 to + 80	°C
Installation	- 10 to + 50	°C

Optical Characteristics (Cabled Max. Values)

Fibre type		Single mode		
Acc. to specification		ITU-T G.652		
Mode field diameter		9.2 ± 0.5		µm
Cladding diameter		125 ± 1		µm
Coating diameter		245 ± 10		µm
Wavelength	1310	1285-1330	1550	nm
Attenuation coefficient	0.38	0.40	0.25	dB/km
Dispersion	-	3.5	18.0	ps/nm.km
PMD		0.5		$ps.km^{-½}$

Fibre Colouring

Fibre No.	1	2	3	4	5	6
Fibre colour	Blue	Orange	Green	Brown	Grey	White
Fibre No.	7	8	9	10	11	12
Fibre colour	Red	Black	Yellow	Violet	Rose	Turquoise

Customised colouring upon request

Binder Yarn Colouring

Fibre bundle	1	2
Yarn colour	Blue	Orange

Testing And Inspection

Testing will comprise the following:

Optical characteristics (each cable length)	Attenuation (Single mode at 1310 / 1550nm)
Mechanical characteristics	Diameter of cable
Electrical characteristics	DC resistance
Visual inspection of cable	Colouring / markings of fibres / tubes

The mechanical characteristics and visual inspection shall be carried out with a frequency of 1 out of 10 drums, starting with the first drum. The first drum shall always be checked when the quantity is less than 10 drums.

Certified test results are provided upon request.

If testing and inspection to be carried out by third parties is required, such parties will be nominated and paid by the Purchaser.

Packing

Standard length	≥ 3000
Length tolerance	+/-100, we reserve the right to deliver up to a maximum of 10 % of the ordered quantity in shorter lengths with a minimum of 2000 m / drum.
Sealing of cable ends	To prevent ingress of moisture the cable ends are sealed with heat shrinkable end caps.
Protection / Packing	The reel shall be lagged with strong wooden battens so as to prevent the OPGW from damage in ordinary handling and shipping.

Other types can be provided upon specified request.

2.2

Double Stranding Layers, Central SST OPGW

SM-MFOA 117-58-16-1S AA-ACS-24SMF

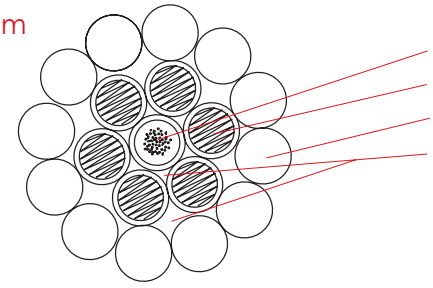
Application

These cables are suitable for installation as optical ground wire in powerline installations. The cable acts as an normal ground wire protecting phase wires from lighting strikes and carries earth fault currents. The cable provides also an optic path in powerline installations for telecommunication needs.

Features

- Installation in the same way as normal ground wire with conventional machinery.
- Most reliable optic solution for fibre optic utilities.
- Best solution in old ground wire replacement and in new line constructions.
- Low cost.

Cross Sectional Diagram



Construction

Optical fibre	:	For fibre specification see optical characteristics.	
Secondary coating	:	The secondary coating consists of one laser welded stainless steel tube. Every fibre is uniquely identified by a fibre colour and for fibre counts above 12 fibres with a coloured fibre bundle yarn. The tube is filled with a water-repellent filling compound.	
Central element	:	1 stainless steel tube	: 3.5 mm
First layer	:	6 ACS wires (20SA)	: 3.52 mm
	:	Direction layer	: "Left "
Second layer	:	12 aluminium alloy (AA) wires	: 3.52 mm
	:	Direction layer	: "Right "
Grease	:	The interstices of the cable core are filled with grease according to IEC 1089 ANNEX C figure C.2	

The interstices of the cable core are filled with grease according to IEC

Technical Characteristics

Number of tubes	1	
Number of fibres / tube	24	
Cable ø	17.58	mm
Cable weight	749	kg/km
Supporting cross-section	175.17	mm^2
AA cross-section	116.78	mm^2
ACS cross-section	58.39	mm^2
Calculated breaking load (UTS)	104.4	kN
Modulus of elasticity	92.0	kN/mm^2
Coefficient of thermal expansion $.10^{-6}$	17.13	1/K
Permissible tensile stress acc.		
Everyday stress (16%)	95.3	N/mm^2
Maximum tensile stress	242.3	N/mm^2
Endurance tensile stress	415.4	N/mm^2

Other types can be provided upon specified request.

Nominal short-time current IEC 724 at		
Initial/Final temperature 30 / 200 °C	16.1	kA, 1 s.
D.C. resistance at 20 °C	0.24	Ω/km
Transport, storage, operation	- 40 to + 80	°C
Installation	- 10 to + 50	°C

Optical Characteristics (Cabled Max. Values)

Fibre type		Single mode		
Acc. to specification		ITU-T G.652.B		
Mode field diameter		9.2 ± 0.5		µm
Cladding diameter		125 ± 1		µm
Coating diameter		245 ± 10		µm
Wavelength	1310	1285-1330	1550	nm
Attenuation coefficient	0.34	0.40	0.21	dB/km
Dispersion	-	3.5	17.5	ps/nm.km
PMD		0.2		$ps.km^{-½}$

Fibre Colouring

Fibre No.	1	2	3	4	5	6
Fibre colour	Blue	Orange	Green	Brown	Grey	White
Fibre No.	7	8	9	10	11	12
Fibre colour	Red	Black	Yellow	Violet	Rose	Turquoise

Customised colouring upon request

Binder Yarn Colouring

Fibre bundle	1	2
Yarn colour	Blue	Orange

Testing And Inspection

Testing will comprise the following:

Optical characteristics (each cable length)	Attenuation (Single mode at 1310 / 1550nm)
Mechanical characteristics	Diameter of cable
Electrical characteristics	DC resistance
Visual inspection of cable	Colouring / markings of fibres / tubes

The mechanical characteristics and visual inspection shall be carried out with a frequency of 1 out of 10 drums, starting with the first drum. The first drum shall always be checked when the quantity is less than 10 drums.

Certified test results are provided upon request.

If testing and inspection to be carried out by third parties is required, such parties will be nominated and paid by the Purchaser.

Packing

Standard length	≥ 3000	m
Length tolerance	+/-100, we reserve the right to deliver up to a maximum of 10 % of the ordered quantity in shorter lengths with a minimum of 2000 m / drum.	m
Sealing of cable ends	To prevent ingress of moisture the cable ends are sealed with heat shrinkable end caps.	
Protection / Packing	The reel shall be lagged with strong wooden battens so as to prevent the OPGW from damage in ordinary handling and shipping.	

Other types can be provided upon specified request.

2.2

Double Stranding Layers, Central ACST OPGW

SM-MFOA 131-29-16.1-1S AA-ACS-24SMF

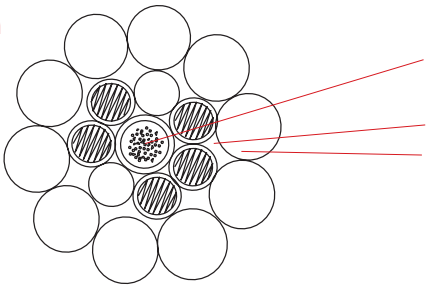
Application

These cables are suitable for installation as optical ground wire in powerline installations. The cable acts as an normal ground wire protecting phase wires from lighting strikes and carries earth fault currents. The cable provides also an optic path in powerline installations for telecommunication needs.

Features

- Installation in the same way as normal ground wire with conventional machinery.
- Most reliable optic solution for fibre optic utilities.
- Best solution in old ground wire replacement and in new line constructions.
- Low cost.

Cross Sectional Diagram



Construction

Optical fibre	:	For fibre specification see optical characteristics.	
Secondary coating	:	The secondary coating consists of one laser welded stainless steel tube. Every fibre is uniquely identified by a fibre colour and for fibre counts above 12 fibres with a coloured fibre bundle yarn. The tube is filled with a water-repellent filling compound.	
Central element	:	1 Aluminium Coated stainless steel tube	: 3.6 mm
First layer	:	5 ACS wires (20SA)	: 2.75 mm
		2 aluminium alloy (AA) wires	: 2.75 mm
	:	Direction layer	: "Left "
Second layer	:	10 aluminium alloy (AA) wires	: 3.9 mm
	:	Direction layer	: "Right "

All values in this product data sheet are nominal unless otherwise stated.

Technical Characteristics

Number of tubes	1	
Number of fibres / tube	24	
Cable ø	16.9	mm
Cable weight	589	kg/km
Supporting cross-section	161.04	mm^2
AA cross-section	131.34	mm^2
ACS cross-section	29.70	mm^2
Calculated breaking load (UTS)	74.43	kN
Modulus of elasticity	76.58	kN/mm^2
Coefficient of thermal expansion $.10^{-6}$	19.10	1/K
Permissible tensile stress acc.		
Everyday stress (16%)	73.90	N/mm^2
Maximum tensile stress	194.10	N/mm^2
Endurance tensile stress	332.80	N/mm^2

Other types can be provided upon specified request.

Nominal short-time current IEC 724 at		
Initial/Final temperature 20 / 200 °C	16.23	kA, 1 s.
D.C. resistance at 20 °C	0.23	Ω/km
Transport, storage, operation	- 40 to + 80	°C
Installation	- 10 to + 50	°C

Optical Characteristics (Cabled Max. Values)

Fibre type		Single mode		
Acc. to specification		ITU-T G.652.B		
Mode field diameter		9.2 ± 0.5		µm
Cladding diameter		125 ± 1		µm
Coating diameter		245 ± 10		µm
Wavelength	1310	1285-1330	1550	nm
Attenuation coefficient	0.34	0.40	0.21	dB/km
Dispersion	-	3.5	17.5	ps/nm.km
PMD		0.2		$ps.km^{-½}$

Fibre Colouring

Fibre No.	1	2	3	4	5	6
Fibre colour	Blue	Orange	Green	Brown	Grey	White
Fibre No.	7	8	9	10	11	12
Fibre colour	Red	Black	Yellow	Violet	Rose	Turquoise

Customised colouring upon request

Binder Yarn Colouring

Fibre bundle	1	2
Yarn colour	Blue	Orange

Testing And Inspection

Testing will comprise the following:

Optical characteristics (each cable length)	Attenuation (Single mode at 1310 / 1550nm)
Mechanical characteristics	Diameter of cable
Electrical characteristics	DC resistance
Visual inspection of cable	Colouring / markings of fibres / tubes

The mechanical characteristics and visual inspection shall be carried out with a frequency of 1 out of 10 drums, starting with the first drum. The first drum shall always be checked when the quantity is less than 10 drums.

Certified test results are provided upon request.

If testing and inspection to be carried out by third parties is required, such parties will be nominated and paid by the Purchaser.

Packing

Standard length	≥ 3000	m
Length tolerance	+/-100, we reserve the right to deliver up to a maximum of 10 % of the ordered quantity in shorter lengths with a minimum of 2000 m / drum.	m
Sealing of cable ends	To prevent ingress of moisture the cable ends are sealed with heat shrinkable end caps.	
Protection / Packing	The reel shall be lagged with strong wooden battens so as to prevent the OPGW from damage in ordinary handling and shipping.	

Other types can be provided upon specified request.

2.2

Double Stranding Layers, Lateral Position SST OPGW

SM-MFOA 83-23-14-0.5S ACS-24SMF

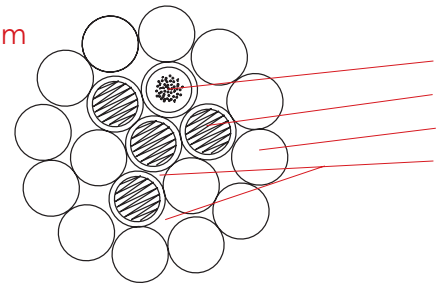
Application

These cables are suitable for installation as optical ground wire in powerline installations. The cable acts as an normal ground wire protecting phase wires from lighting strikes and carries earth fault currents. The cable provides also an optic path in powerline installations for telecommunication needs.

Features

- Installation in the same way as normal ground wire with conventional machinery.
- Most reliable optic solution for fibre optic utilities.
- Best solution in old ground wire replacement and in new line constructions.
- Low cost.

Cross Sectional Diagram



Construction

Optical fibre	:	For fibre specification see optical characteristics.	
Secondary coating	:	The secondary coating consists of one laser welded stainless steel tube. Every fibre is uniquely identified by a fibre colour and for fibre counts above 12 fibres with a coloured fibre bundle yarn. The tube is filled with a water-repellent filling compound.	
Central element	:	1 ACS wires (20SA)	: 2.75 mm
First layer	:	1 stainless steel tube	: 2.7 mm
		3 ACS wires (20SA)	: 2.75 mm
		2 aluminium alloy (AA) wires	: 2.75 mm
	:	Direction layer	: "Left "
Second layer	:	12 aluminium alloy (AA) wires	: 2.75 mm
	:	Direction layer	: "Right "
Grease	:	The interstices of the cable core are filled with grease according to IEC 1089 ANNEX C figure C.2	

All values in this product data sheet are nominal unless otherwise stated.

Technical Characteristics

Number of tubes	1	
Number of fibres / tube	24	
Cable Ø	13.75	mm
Cable weight	412	kg/km
Supporting cross-section	106.9	mm^2
AA cross-section	83.15	mm^2
ACS cross-section	23.67	mm^2
Calculated breaking load (UTS)	53.1	kN
Modulus of elasticity	80.67	kN/mm^2
Coefficient of thermal expansion $.10^{-6}$	18.54	1/K
Permissible tensile stress acc.		
Everyday stress	79.5	N/mm^2
Maximum tensile stress	208.6	N/mm^2
Endurance tensile stress	357.5	N/mm^2

Other types can be provided upon specified request.

Nominal short-time current IEC 724 at		
Initial/Final temperature 40 / 200 °C	14.0	kA, 0.5 s.
D.C. resistance at 20 °C	0.360	Ω/km
Transport, storage, operation	- 40 to + 80	°C
Installation	- 10 to + 50	°C

Optical Characteristics (Cabled Max. Values)

Fibre type		Single mode		
Acc. to specification		ITU-T G.652		
Mode field diameter		9.2 ± 0.5		µm
Cladding diameter		125 ± 1		µm
Coating diameter		245 ± 10		µm
Wavelength	1310	1285-1330	1550	nm
Attenuation coefficient	0.38	0.40	0.25	dB/km
Dispersion	-	3.5	18.0	ps/nm.km
PMD		0.5		$ps.km^{-½}$

Fibre Colouring

Fibre No.	1	2	3	4	5	6
Fibre colour	Blue	Orange	Green	Brown	Grey	White
Fibre No.	7	8	9	10	11	12
Fibre colour	Red	Black	Yellow	Violet	Rose	Turquoise

Customised colouring upon request

Binder Yarn Colouring

Fibre bundle	1	2
Yarn colour	Blue	Orange

Testing And Inspection

Testing will comprise the following:

Optical characteristics (each cable length)	Attenuation (Single mode at 1310 / 1550nm)
Mechanical characteristics	Diameter of cable
Electrical characteristics	DC resistance
Visual inspection of cable	Colouring / markings of fibres / tubes

The mechanical characteristics and visual inspection shall be carried out with a frequency of 1 out of 10 drums, starting with the first drum. The first drum shall always be checked when the quantity is less than 10 drums.

Certified test results are provided upon request.

If testing and inspection to be carried out by third parties is required, such parties will be nominated and paid by the Purchaser.

Packing

Standard length	≥ 3000	m
Length tolerance	+/-100, we reserve the right to deliver up to a maximum of 10 % of the quantity in shorter lengths with a minimum of 2000 m / drum.	m
Sealing of cable ends	To prevent ingress of moisture the cable ends are sealed with heat shrinkable end caps.	
Protection / Packing	The reel shall be lagged with strong wooden battens so as to prevent the OPGW from damage in ordinary handling and shipping.	

Other types can be provided upon specified request.

2.2

OPGW Installation Procedure

Introduction

We as **Doha Cables** one of the most advanced and leading cables manufacturer in the Middle East has a great history in engineering, implementing and managing major fiber optic networks in Qatar thanks to our well established partnership with our principles all over the world. Our major business partner is DRAKA NKF TELECOM (Netherlands) for producing Optical Ground Wires (OPGW). Due to the necessity of having OPGW, we decide to start to produce, instal and maintain the OPGW by doing the relenat sercvice on turn-key bases.

Doha Cables frame, mainly outlines the OPGW & Optical Fiber Cables in an evolved, innovated, state-of-the Art and latest technology modules. The advanced technology provided reflects wide latitude of matching and conformity with the supper design and luxury planning.

Generally, **Doha Cables** follows the customer's specification to meet the stated requirements. We are offering our inhouse produced OPGW cables as, a perfect match solution to the required specifications with much more features to serve the advanced telecommunication application through optical fibers..

Furthermore, we cover the customer's scope of supply completely with state-of-the-art technology of OPGW, optical fiber cables, fittings and accessories to fullfil the projects turnkey activities.

Installation of OPGW Cables

Important factors to be taken into account during stringing
The general method of installation is shown in Figure 1.

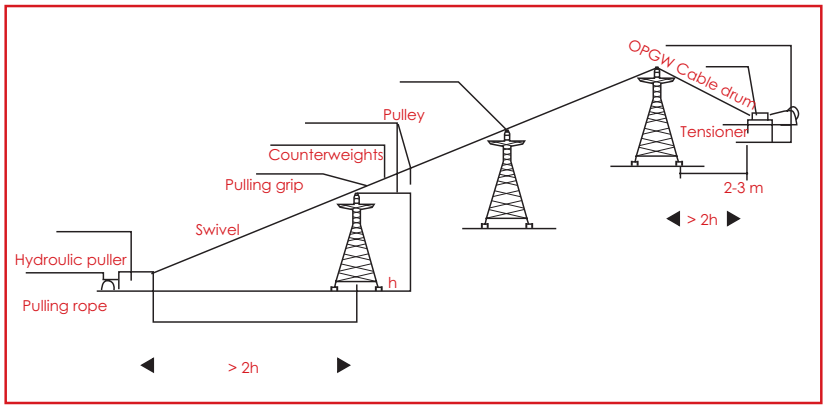


Fig. 1

As a rule, one drum at a time of OPGW cable is installed. In case of any difficulties, the Doha Cables supervisors have to be contacted. He will give the correct guidelines to proceed with the OPGW cable installation.

Please refer to figure 2 to 6 to see the installation tools, components and elements.

Fig. 2: Swivel

Fig. 3: Pulley

Fig. 4: Pulling grip

Fig. 5: Clamp

Fig. 6: Pulling Rope

1 Basic Controls

Strict controls must be established during installation to ensure that it is performed correctly, without excess tension, twist of the OPGW, unsuitable compression, regulating a correct sagging. Neither the fibers nor the Fibers tube (Stainless Steel Tube or Aluminum Tube) will be damaged.

The tensioner and the puller should be placed at a distance from the first tower pulley which is equivalent to at least twice the height of the pulley (see figure 1 and figure 7).

Location of tensioner and drum

Fig. 7

Intermediate control points should be established, with the necessary precautions that are required at critical points during installation (beginning/end of drum, angles, etc.).

During installation, the OPGW cable should not strike nor graze any objects other than the pulleys.

No obstacles must prevent the pulleys from rotating in the correct way. The minimum bending / twisting radius must be controlled during all installation operations. Please refer to figure 8 for anti – twisting devices.

Fig. 8

Ensure that the metal part of the pulleys do not make contact with the cable to prevent it from being damaged.

2 Stringing Speed

The maximum permissible stringing speed is 40 meters per minute. It always depends on the stringing conditions and must be reduced to avoid damages to the optical fibers, the aluminum tube and the OPGW cable.

3 Pulling Tension

The recommended pulling tension shall be lower than 1.5 times the weight (kg) of 1 km OPGW cable length.

4 Minimum Bending Radius

The minimum bending radius is in the whole situations as follows:

- on tensioner reels 40 times the cable diameter
- during installation 400 mm
- after installation 20 times the cable diameter

Please refer to figure 9 for puller / tensioner machines and figure 10 to see the Ground connection of the OPGW cable at the tensioner outlet.

Fig. 9

Fig. 10

5 Communications During Stringing

The personnel located at the puller, the tensioner, the pulley crossings and the cable ends are in communication at all times by communication system.

6 Sagging of the Cable

Generally, the methods used to obtain the correct sag values of the OPGW cables are the same used for conventional ground wire cables. The specific recommendations are as follows:

Pulling is performed by a preformed fitting or tension clamp (in intermediate spans) or with the pull jacket at the end.

Sagging of the cable and fittings instalation are always performed after stringing. At this time, the attachment fittings are also installed to prevent damage to the OPGW cable.

The installer is responsible for any damage to the OPGW cable that may occur due to failure cause by incorrect application of the previous points. If the tension and sags are different from the expected values, the stringing or sagging should be halted. The Doha Cables supervisor and the project leader will be consulted in order to safely continue the installation operations.

7 Installation of Fittings and Accessories

The fittings: tension clamps, suspensions, earthling clamps, dampers, etc. should be installed in accordance with the manufacturer's instructions and using the appropriate tools.

8 Personnel Training

All personnel who participate in the installation of the OPGW cable should be informed of handling problems and installation procedures for the OPGW cable. It is responsibility of the installer to assure the correct instruction to the whole personnel involved in the installation works.

9 Supervision

The supervisor designated by Doha Cables will be responsible for ensuring compliance with all of the points indicated in this document as well as all required standards applicable to the specific installation. The supervisor will communicate to Doha Cables any non-conformity detected in the cable or cable installation procedures.
If a situation occurs that is not covered in the present installation procedure, whenever this occurs with an OPGW cable, the Supervisor will determine whether or not the action is correct. The supervisor will request the installer to provide a descriptive list of the components to be used for installation. Moreover, he will verify that these components are sufficient and adequate.

10 Splices

After the stringing of the OPGW and the optical measurements done after installation, the fibers inside OPGW cable will be spliced.

11 Transmission Test During The Installation Phases

Prior to as well as during the installation phases, the transmission characteristics of the fibre optic cables are verified in order to ensure proper installation and be sure that the final tests are within the specified range of tolerances.

12 Measurements Before OPGW Cable Installation

Prior to OPGW cable installation, each optical fibres is verified using OTDR. The attenuation values recorded are registered in "Attenuation test during installation phase" document and saved on an electronic diskette. This computer register is kept by Doha Cables. The attenuation values recorded are registered in a document and are also saved on an electronic diskette. This computer register is kept by Doha Cables. It is suitably identified and referenced.

13 Splices Measurement

After splicing, each joint is optically verified using OTDR in order to ensure that the attenuation values are within the required margins. The attenuation values recorded are registered in a document, "Splice attenuation test" and are also saved on an electronic diskette. This computer register is kept by Doha Cables. It is suitably identified and referenced.

14 Measurements After Installation

After the cable has been installed, and prior to the splices, each of the cable fibers are verified once again using OTDR.

15 Final Acceptance Test

After installation, a final measurement of the transmission characteristics is done and the values are duly recorded. A copy of this document is submitted to the customer. These measurements are also recorded and kept by Doha Cables.

16 Health & Safety

The supervisor designated by Doha Cables is responsible for compliance with the general Health and Safety standards for Doha Cables or the requirements stipulated by contract, if any.

17 Environment

17.1 Withdrawal of Special Waste (Toxic and Dangerous)

If any type of special waste such as oil, grease, solvents, saturation of gloves or rags, etc. are produced during cable installation, proceed as follows:

- Place in heavy-duty carboys or steel drums, indicating what type of waste it is.

17.2 Withdrawal of Non-special or Inert Waste

- If there are excess materials or waste such as aluminum, optical fiber, plastic, wood, iron, etc., whenever possible, this should be sent to an authorized recycler or a controlled dumping ground.

- Regardless of the amount, the waste should never be abandoned. Moreover, the area should be cleaned when the work is finished.

3 POWER CABLES

www.dohacable.com

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Operating Voltage (Up to 0.6/1kV)

Cable Construction

1. Conductor

Copper or Aluminium conductors, solid, stranded or flexible;round or sectoral shape.

2. Insulation

An extruded layer of PVC or XLPE is applied over the conductor.
PVC insulated cables are suitable for maximum conductor operating temperature of 70°C or 85°C and 90°C for XLPE.

3. Assembly

In case of multicore cables'cores are assembled together using non hygroscopic filler (if needed) to fill space between cores, wrapped with suitable binder tape to form a round cable.

4. Bedding

In case of armoured cables an extruded layer of PVC is applied as bedding.

5. Armouring

a. Steel Tape: Double layers of steel tapes are applied helically.
b. Steel Wire: Galvanized steel wires are applied helically.

6. Sheath

An extruded layer of PVC is applied as an outer sheath, or according to the client special requirements.

Option

Lead sheath: Upon request a layer of lead is extruded over the bedding layer.

Armouring of Single Core Cable

1. Armouring by non-magnetic material either Aluminium Tape or Aluminium Wire armouring to reduce the magnetic losses.
2. If it is required for single core cable to be armoured by steel wire armouring, the magnetic circuit around the single core cable should be interrupted by inserting insulated copper wires between the steel wires as shown in the figure.

Armouring of Single Core Cable

System Designation for Low Voltage Cables

You can order our product by giving the following information:

1. Cable code as per the catalogue.
2. If your required cable/conductor is out of our catalogue range, you can use the following codes to determine your cable.

o o o o o o o o o o

Conductor

C Copper
A Aluminium
D Copper + swelling powder
B Tinned Copper

Insulation

P PVC
X XLPE
D PVC - Flame Retardant
N Polyethylene
G PVC + Swelling Tape

Voltage

1 0.6/1 kV
D 450/750 V

Conductor Type

F Flexible
S Solid
T Stranded

Sheathing

1 Single sheath
A PVC + flame retardant
Z PVC + anti termite
M PVC + 2.5% Carbon black
S PVC + flame retardant + low smoke
B PVC + flame retardant + anti termite

No. of Cores

01 Single core
02 Double cores
03 Three cores
04 Four cores
05 3.5 cores
A5 Five cores

Code	C.S.A mm²	Code	C.S.A mm²
04	1.5	16	95
05	2	17	120
06	2.5	18	150
07	3	19	185
08	4	20	240
09	6	30	300
10	10	40	400
11	16	50	500
12	25	60	630
13	35	70	800
14	50	80	1000
15	70	81	1200

Armouring/ Screening/ Metal Sheath

U Unarmoured
L Lead
N Lead alloy
A Steel tape
B Aluminium tape
W Steel wire
X Aluminium wire
Z Copper tape screen
C Lead + steel tape
D Lead + steel wire
G Galvanized steel tape
O Steel wire+ Copper wire
Q Copper shield + steel tape
R Copper shield + steel wire
T Lead + Aluminium wire
P Lead + Aluminium tape

Flexible PVC Cables HO5VV-F

Application:

These cables can be used for domestic cooking and heating appliances provided the the cable does not come into contract with the heating elements.

Engineering Specification:

Standard:
BS 6500

Rated Voltage:
300 / 500 V

Conductor:
Stranded plain annealed copper as per BS-6360

Insulation:
PVC type TI-as per BS-6746

Colour code:
Blue, Brown

Three cores:
Green / Yellow, Blue, Brown

Four cores:
Green / Yellow, Black, Blue, Brown

Assembly:
Cores twisted together to form a round cable

Sheath:
PVC type TM-2 as per BS6746

Temperature rating:
+5˚C up to +70˚C

Technical Information

Product-Code	Conductor size	Conductor		Nominal insulation Thickness	Nominal Sheath Thickness	Approximate overall diameter	Approximate net weight
		No.x dia.	Max. DC Res. at 20˚C				
	mm2	No. x mm	Ohm / Km	mm	mm	mm	kg / km
H05VV-F2-2*1.5R	2 x 1.5	30 x 0.25	13.3	0.7	0.8	7.7	91
H05VV-F2-2*2.5R	2 x 2.5	50 x 0.25	7.98	0.8	1.0	9.4	139
H05VV-F2-2*4.0R	2 x 4	56 x 0.3	4.95	0.8	1.1	10.7	192
H05VV-F2-3*1.5R	3 x 1.5	30 x 0.25	13.3	0.7	0.9	8.4	114
H05VV-F2-3*2.5R	3 x 2.5	50 x 0.25	7.98	0.8	1.1	10.2	175
H05VV-F2-3*4.0R	3 x 4	56 x 0.3	4.95	0.8	1.2	11.6	244
H05VV-F2-4*1.5R	4 x 1.5	30 x 0.25	13.3	0.7	1.0	9.3	142
H05VV-F2-4*2.5R	4 x2 .5	50 x 0.25	7.98	0.8	1.1	11.1	211
H05VV-F2-4*4.5R	4 x 4	56 x 0.3	4.95	0.8	1.2	12.6	297

The above data are approximate and subject to normal manufacturing tolerance.
Other types can be provided on specific request.

Single Core Cables with Solid or Stranded Copper Conductors and PVC Insulated

Description

- Soft annealed solid or stranded Copper conductors insulated with PVC compound rated 70 °C or 90 °C according to IEC 60227 & BS 6004.

Application

- For indoor fixed installations in dry locations, laid in conduits, as well as in steel support brackets.

Product - code	Nominal Cross Sectional Area	Max. Conductor Resistance		Current Rating in Air		Approx. Overall Diameter	Approx. Weight
		DC at 20 °C	AC at 70 °C	Free	In Pipes		
	mm^2	Ω/km	Ω/km	A	A	mm	kg/km
CPD-S001-U04	1.5 re	12.1000	14.6000	17	13	2.8	20
CPD-T001-U04	1.5 rm	12.1000	14.6000	17	13	3.0	21
CPD-S001-U05	2 re	9.1500	10.9000	19	15	3.2	27
CPD-T001-U05	2 rm	9.1500	10.9000	19	15	3.4	28
CPD-S001-U06	2.5 re	7.4100	8.8900	24	19	3.4	31
CPD-T001-U06	2.5 rm	7.4100	8.8900	24	19	3.6	33
CPD-S001-U07	3 re	6.1000	7.4100	27	21	3.6	37
CPD-T001-U07	3 rm	6.1000	7.4100	27	21	3.8	39
CPD-S001-U08	4 re	4.6100	5.5100	32	23	3.9	47
CPD-T001-U08	4 rm	4.6100	5.5100	32	23	4.2	50
CPD-S001-U09	6 re	3.0800	3.6800	40	29	4.4	68
CPD-T001-U09	6 rm	3.0800	3.6800	40	29	4.7	71
CPD-T001-U10	10 rm	1.8300	2.1700	57	41	6.1	117
CPD-T001-U11	16 rm	1.1500	1.3700	76	54	7.1	177
CPD-T001-U12	25 rm	0.7270	0.8600	103	70	8.8	278
CPD-T001-U13	35 rm	0.5240	0.6300	128	87	9.9	371
CPD-T001-U14	50 rm	0.3870	0.4600	156	106	11.8	514
CPD-T001-U15	70 rm	0.2680	0.3200	200	131	13.5	711
CPD-T001-U16	95 rm	0.1930	0.2300	251	166	15.7	967
CPD-T001-U17	120 rm	0.1530	0.1900	293	190	17.4	1240
CPD-T001-U18	150 rm	0.1240	0.1500	335	219	19.4	1500
CPD-T001-U19	185 rm	0.0991	0.1200	390	250	21.5	1852
CPD-T001-U20	240 rm	0.0754	0.0920	471	300	24.7	2457
CPD-T001-U30	300 rm	0.0601	0.0750	540	340	27.2	2977

The above data is approximate and subjected to manufacturing tolerance.

re : round, Solid
rm : round, Stranded

450/750 V

Single Core Cables with Flexible Copper Conductors and PVC Insulated

Description

- Soft annealed Copper fine wires, bunched together in subunits or stranded bunched groups into a main units, which forms the flexible conductor. Insulated with soft PVC 70 °C or 90 °C Compound.
- Cables are produced according to IEC 60227 or BS 6004.

Application

- For indoor fixed installations in dry locations, where particular flexibility is required. For electrical panels connection or for electrical apparatus they can be laid in groups around steel sheets.

Product - Code	Nominal Cross Sectional Area	Maximum Diameter of Wires	Max. Conductor Resistance		Current Rating in Air		Approx. Overall Diameter	Approx. Weight
			DC at 20 °C	AC at 70 °C	Free	In Pipes		
	mm^2	mm	Ω/km	Ω/km	A	A	mm	kg/km
CPD-F001-U04	1.5	0.26	13.3000	15.9500	17	13	3.0	21
CPD-F001-U06	2.5	0.26	7.9800	9.5600	24	19	3.7	34
CPD-F001-U08	4	0.31	4.9500	5.9300	32	23	4.5	50
CPD-F001-U09	6	0.31	3.3000	3.9500	40	29	5.1	71
CPD-F001-U10	10	0.41	1.9100	2.2900	57	41	6.9	120
CPD-F001-U11	16	0.41	1.2100	1.4500	76	54	7.6	179
CPD-F001-U12	25	0.41	0.7800	0.9400	103	70	9.5	276
CPD-F001-U13	35	0.41	0.5540	0.6630	128	87	11.0	375
CPD-F001-U14	50	0.41	0.3860	0.4620	156	106	12.6	542
CPD-F001-U15	70	0.51	0.2720	0.3260	200	131	14.6	733
CPD-F001-U16	95	0.51	0.2060	0.2470	251	166	16.8	957
CPD-F001-U17	120	0.51	0.1610	0.1930	293	190	18.9	1243
CPD-F001-U18	150	0.51	0.1290	0.1550	335	219	21.2	1548
CPD-F001-U19	185	0.51	0.1060	0.1270	390	250	23.4	1895
CPD-F001-U20	240	0.51	0.0801	0.0960	471	300	26.7	2400

The above data is approximate and subjected to manufacturing tolerance.

Single Core Cables, with Stranded Circular Copper Conductors, PVC Insulated and PVC Sheathed

Description

- Soft annealed stranded Copper or Aluminium conductor.
  Insulated with PVC compound rated 70 °C and sheathed with PVC Compound layer .
- Cables are produced according to IEC 60502.

Application

- For outdoor and indoor installations in damp and wet locations. They are normally used for power distribution in urban networks, industrial plants, as well as in thermopower and hydropower stations.

Product - Code	Nominal Cross Sectional Area	Max. Conductor Resistance		Current Rating						Approx. Overall Diameter	Approx. Weight
		DC at 20 °C	AC at 70 °C	Laid in Ground			Laid in Free Air				
				⊙⊙⊙	⊙⊙	⊙	⊙	⊙⊙⊙	⊙⊙		
	mm²	Ω/km	Ω/km	A	A	A	A	A	A	mm	kg/km
a - Copper Conductors											
CP1-T101-U08	4	4.6100	5.5100	42	40	32	37	33	29	7.0	86
CP1-T101-U09	6	3.0800	3.6800	52	50	40	48	42	38	7.9	115
CP1-T101-U10	10	1.8300	2.1700	70	67	52	66	58	51	8.9	165
CP1-T101-U11	16	1.1500	1.3700	90	85	65	80	75	65	9.9	231
CP1-T101-U12	25	0.7270	0.8600	115	110	85	105	95	90	11.6	343
CP1-T101-U13	35	0.5240	0.6300	135	130	105	130	125	110	12.7	445
CP1-T101-U14	50	0.3870	0.4600	160	155	125	160	150	135	14.6	600
CP1-T101-U15	70	0.2680	0.3200	200	190	155	200	190	170	16.3	805
CP1-T101-U16	95	0.1930	0.2300	235	225	185	250	240	210	18.7	1085
CP1-T101-U17	120	0.1530	0.1900	270	255	210	285	275	245	20.4	1350
CP1-T101-U18	150	0.1240	0.1500	300	285	235	330	320	280	22.6	1654
CP1-T101-U19	185	0.0991	0.1200	345	325	270	380	370	320	24.9	2030
CP1-T101-U20	240	0.0754	0.0920	400	375	310	480	460	385	28.3	2675
CP1-T101-U30	300	0.0601	0.0750	450	420	350	550	530	450	31.1	3280
CP1-T101-U40	400	0.0470	0.0590	515	475	390	630	615	520	35.3	4350
CP1-T101-U50	500	0.0366	0.0480	580	525	435	720	700	600	38.8	5355
CP1-T101-U60	630	0.0283	0.0390	660	590	495	830	810	680	42.7	6685
CP1-T101-U70	800	0.0221	0.0290	740	650	555	940	920	775	47.2	8600
CP1-T101-U80	1000	0.0176	0.0250	820	710	605	1030	1010	860	52.0	10500

The above data is approximate and subjected to manufacturing tolerance.

contd

0.6/1 (1.2) kV

Single Core Cables, with Stranded Circular Aluminium Conductors, PVC Insulated and PVC Sheathed

Product - Code	Nominal Cross Sectional Area	Max. Conductor Resistance		Current Rating						Approx. Overall Diameter	Approx. Weight
		DC at 20 °C	AC at 70 °C	Laid in Ground			Laid in free air				
				⊙⊙⊙	⊙⊙⊙	⊙⊙⊙	⊙	⊙⊙⊙	⊙⊙⊙		
	mm²	Ω/km	Ω/km	A	A	A	A	A	A	mm	kg/km
b - Aluminium Conductors											
AP1-T101-U11	16	1.9100	2.2900	65	63	50	65	60	45	9.9	132
AP1-T101-U12	25	1.2000	1.4400	85	83	65	85	80	65	11.6	185
AP1-T101-U13	35	0.8680	1.0400	105	102	80	105	100	85	12.7	250
AP1-T101-U14	50	0.6410	0.7700	125	120	95	125	120	105	14.6	295
AP1-T101-U15	70	0.4430	0.5330	155	145	120	165	155	125	16.3	375
AP1-T101-U16	95	0.3200	0.3850	185	175	135	205	195	160	18.7	500
AP1-T101-U17	120	0.2530	0.3050	210	200	165	235	225	185	20.4	605
AP1-T101-U18	150	0.2060	0.2480	235	225	180	265	255	210	22.6	725
AP1-T101-U19	185	0.1640	0.1980	265	255	205	310	300	245	24.8	900
AP1-T101-U20	240	0.1250	0.1510	310	295	240	365	355	290	28.3	1150
AP1-T101-U30	300	0.1000	0.1220	355	335	270	420	405	335	31.1	1420
AP1-T101-U40	400	0.0778	0.0954	410	380	310	500	480	390	35.3	1750
AP1-T101-U50	500	0.0605	0.0751	465	430	355	580	560	460	38.8	2220
AP1-T101-U60	630	0.0469	0.0595	535	490	405	680	660	535	42.7	2750
AP1-T101-U70	800	0.0367	0.0470	600	530	450	765	745	620	47.2	3450
AP1-T101-U80	1000	0.0291	0.0370	665	585	495	840	820	690	52.0	4230

The above data is approximate and subjected to manufacturing tolerance.

Multicore Cables, with Stranded Copper Conductors PVC Insulated and PVC Sheathed

Description

- Multicore cables of stranded Copper conductors are insulated with PVC compound rated 70°C, assembled together, covered with overall jacket of PVC compound.
- Cables are produced according to IEC 60502.

Application

- For outdoor and indoor installations in damp and wet locations.

Product - Code	Nominal Cross Sectional Area	Max. Conductor Resistance		Current Rating			Approx. Overall Diameter	Approx. Weight
		DC at 20 °C	AC at 70 °C	Laid Direct in Ground	Laid in Ducts	Laid in Free Air		
	mm^2	Ω/km	Ω/km	A	A	A	mm	kg/km
Two Core Cables								
CP1-T102-U04	1.5 rm	12.1000	14.600	24	19	20	10.1	120
CP1-T102-U06	2.5 rm	7.4100	8.870	30	25	28	10.9	145
CP1-T102-U08	4 rm	4.6100	5.540	40	32	39	12.9	205
CP1-T102-U09	6 rm	3.0800	3.690	50	40	50	13.9	255
CP1-T102-U10	10 rm	1.8300	2.190	65	55	66	15.0	425
CP1-T102-U11	16 rm	1.1500	1.390	85	65	88	17.0	580
CP1-T102-U12	25 rm	0.7270	0.870	110	85	116	20.0	845
CP1-T102-U13	35 rm	0.5240	0.628	130	105	143	22.2	1090
Three Core Cables								
CP1-T103-U04	1.5 rm	12.1000	14.600	21	18	18	10.6	145
CP1-T103-U06	2.5 rm	7.4100	8.870	27	23	22	11.5	190
CP1-T103-U08	4 rm	4.6100	5.540	35	30	31	13.6	270
CP1-T103-U09	6 rm	3.0800	3.690	45	36	39	14.7	340
CP1-T103-U10	10 rm	1.8300	2.190	60	48	53	16.4	485
CP1-T103-U11	16 rm	1.1500	1.390	75	60	72	18.6	685
CP1-T103-U12	25 rm	0.7270	0.870	100	80	94	21.8	995
CP1-T103-U13	35 rm	0.5240	0.628	120	95	110	24.2	1300
Four Core Cables								
CP1-T104-U04	1.5 rm	12.1000	14.6000	21	18	18	11.4	180
CP1-T104-U06	2.5 rm	7.4100	8.8700	27	23	22	12.4	230
CP1-T104-U08	4 rm	4.6100	5.5400	35	30	31	14.8	335
CP1-T104-U09	6 rm	3.0800	3.6900	45	36	39	16.0	425
CP1-T104-U10	10 rm	1.8300	2.1900	60	48	53	17.9	635
CP1-T104-U11	16 rm	1.1500	1.3900	75	60	72	20.3	880
CP1-T104-U12	25 rm	0.7270	0.8700	100	80	94	23.9	1295
CP1-T104-U13	35 rm	0.5240	0.6280	120	95	110	26.6	1700
CP1-T104-U14	50 sm	0.3870	0.4640	145	115	138	29.3	2225
CP1-T104-U15	70 sm	0.2680	0.3220	175	145	171	32.9	3065
CP1-T104-U16	95 sm	0.1930	0.2320	210	165	209	37.8	4175
CP1-T104-U17	120 sm	0.1530	0.1850	240	195	242	41.2	5205
CP1-T104-U18	150 sm	0.1240	0.1510	270	220	275	45.9	6400
CP1-T104-U19	185 sm	0.0991	0.1210	300	245	314	50.7	7960
CP1-T104-U20	240 sm	0.0754	0.0840	345	290	374	57.0	10330
CP1-T104-U30	300 sm	0.0601	0.0770	390	320	440	63.3	12915
CP1-T104-U40	400 sm	0.0470	0.0606	453	376	507	70.1	16500
CP1-T104-U50	500 sm	0.0366	0.0491	510	429	566	77.6	21085

contd

Multicore Cables, with Stranded Copper Conductors, PVC Insulated and PVC Sheathed

Product - Code	Nominal Cross Sectional Area		Max. Conductor Resistance		Current Rating			Approx. Overall Diameter	Approx. Weight
			DC at 20 °C	AC at 70 °C	Laid Direct in Ground	Laid in Ducts	Laid in Free Air		
	mm^2		Ω/km	Ω/km	A	A	A	mm	kg/km
Four Core Cables with Reduced Neutral									
CP1-T105-U13	35 rm	16 rm	0.5240/1.1500	0.6280/1.3900	120	95	110	25.0	1505
CP1-T105-U14	50 sm	25 rm	0.3870/0.7270	0.4640/0.8700	145	115	138	28.1	2115
CP1-T105-U15	70 sm	35 rm	0.2680/0.5240	0.3220/0.6280	175	145	171	31.4	2725
CP1-T105-U16	95 sm	50 sm	0.1930/0.3870	0.2320/0.4640	210	165	209	36.1	3690
CP1-T105-U17	120 sm	70 sm	0.1530/0.2680	0.1850/0.3220	240	195	242	39.5	4675
CP1-T105-U18	150 sm	70 sm	0.1240/0.2680	0.1510/0.3220	270	220	275	43.5	5580
CP1-T105-U19	185 sm	95 sm	0.0991/0.1930	0.1210/0.2320	300	245	314	48.2	7025
CP1-T105-U20	240 sm	120 sm	0.0754/0.1530	0.0840/0.1850	345	290	374	54.2	9060
CP1-T105-U30	300 sm	150 sm	0.0601/0.1240	0.0770/0.1510	390	320	440	60.0	11280
CP1-T105-U40	400 sm	185 sm	0.0470/0.0991	0.0606/0.1210	453	376	507	66.0	15270
CP1-T105-U50	500 sm	240 sm	0.0366/0.0754	0.0491/0.0840	510	429	566	73.3	19205

The above data is approximate and subjected to manufacturing tolerance.

rm : round, Stranded
sm : Sector, Stranded

Multicore Cables, with Stranded Aluminium Conductors, PVC Insulated and PVC Sheathed

Description

- Multicore cables of stranded Aluminium conductors are insulated with PVC compound rated 70°C, assembled together, covered with overall jacket of PVC compound.
- Cables are produced according to IEC 60502.

Application

- For outdoor and indoor installations in damp and wet locations.

Product - Code	Nominal Cross Sectional Area	Max. Conductor Resistance		Current Rating			Approx. Overall Diameter	Approx. Weight
		DC at 20 °C	AC at 70 °C	Laid Direct in Ground	Laid in Ducts	Laid in Free Air		
	mm^2	Ω/km	Ω/km	A	A	A	mm	kg/km
Two Core Cables								
AP1-T102-U10	10 rm	3.080	3.300	46	39	46	15.0	295
AP1-T102-U11	16 rm	1.910	2.290	60	46	62	17.0	385
AP1-T102-U12	25 rm	1.200	1.440	77	60	81	20.0	540
AP1-T102-U13	35 rm	0.868	1.040	103	83	114	22.2	670
Three Core Cables								
AP1-T103-U10	10 rm	3.080	3.300	42	34	37	16.4	305
AP1-T103-U11	16 rm	1.910	2.290	53	42	50	18.6	400
AP1-T103-U12	25 rm	1.200	1.440	70	56	66	21.8	550
AP1-T103-U13	35 rm	0.868	1.040	95	75	88	24.2	680
Four Core Cables								
AP1-T104-U10	10 rm	3.0800	3.3000	42	34	37	17.9	395
AP1-T104-U11	16 rm	1.9100	2.2900	53	42	50	20.3	495
AP1-T104-U12	25 rm	1.2000	1.4400	70	56	66	23.9	700
AP1-T104-U13	35 rm	0.8680	1.0400	95	75	88	26.6	870
AP1-T104-U14	50 sm	0.6410	0.7710	115	85	105	29.3	1060
AP1-T104-U15	70 sm	0.4430	0.5330	135	110	132	32.9	1380
AP1-T104-U16	95 sm	0.3200	0.3850	165	130	160	37.8	1865
AP1-T104-U17	120 sm	0.2530	0.3050	185	150	187	41.2	2300
AP1-T104-U18	150 sm	0.2060	0.2490	210	170	215	45.9	2760
AP1-T104-U19	185 sm	0.1640	0.1990	235	195	248	50.7	3400
AP1-T104-U20	240 sm	0.1250	0.1510	275	225	292	57.0	4345
AP1-T104-U30	300 sm	0.1000	0.1230	310	260	347	63.3	5400
AP1-T104-U40	400 sm	0.0778	0.0962	361	300	405	70.1	6890
AP1-T104-U50	500 sm	0.0605	0.0761	413	348	459	77.6	8500

The above data is approximate and subjected to manufacturing tolerance.

contd

0.6/1 (1.2) kV

Multicore Cables, with Stranded Aluminium Conductors, PVC Insulated and PVC Sheathed

Product - Code	Nominal Cross Sectional Area		Max. Conductor Resistance		Current Rating			Approx. Overall Diameter	Approx. Weight
			DC at 20 °C	AC at 70 °C	Laid Direct in Ground	Laid in Ducts	Laid in Free Air		
	mm^2		Ω/km	Ω/km	A	A	A	mm	kg/km
Four Core Cables with Reduced Neutral									
AP1-T105-U13	35 rm	16 rm	0.8680/1.9100	1.0430/2.2900	95	75	88	25.0	720
AP1-T105-U14	50 sm	25 rm	0.6410/1.2000	0.7710/1.4400	115	85	105	28.1	970
AP1-T105-U15	70 sm	35 rm	0.4430/0.8680	0.5330/1.0400	135	110	132	31.4	1240
AP1-T105-U16	95 sm	50 sm	0.3200/0.6410	0.3850/0.7710	165	130	160	36.1	1660
AP1-T105-U17	120 sm	70 sm	0.2530/0.4430	0.3050/0.5330	185	150	187	39.5	2040
AP1-T105-U18	150 sm	70 sm	0.2060/0.4430	0.2490/0.5330	210	170	215	43.5	2435
AP1-T105-U19	185 sm	95 sm	0.1640/0.3200	0.1990/0.3850	235	195	248	48.2	3025
AP1-T105-U20	240 sm	120 sm	0.1250/0.2530	0.1510/0.3050	275	225	292	54.2	3830
AP1-T105-U30	300 sm	150 sm	0.1000/0.2060	0.1230/0.2490	310	260	347	60.0	4720
AP1-T105-U40	400 sm	185 sm	0.0778/0.1640	0.0962/0.1990	361	300	405	66.0	5980
AP1-T105-U50	500 sm	240 sm	0.0605/0.1250	0.0761/0.1510	413	348	459	73.3	7460

The above data is approximate and subjected to manufacturing tolerance.

rm : round, Stranded
sm : Sector, Stranded

Multicore Cables, with Stranded Copper Conductors, PVC Insulated, Steel Tape Armoured and PVC Sheathed

Description

- Multicore cables of stranded Copper conductors are insulated with PVC compound rated 70°C, assembled together, armoured with steel tape and covered with overall jacket of PVC compound.
- Cables are produced according to IEC 60502.

Application

- For outdoor installations in damp and wet locations, where mechanical damages are expected to occur.

Product - Code	Nominal Cross Sectional Area	Max. Conductor Resistance		Current Rating			Approx. Overall Diameter	Approx. Weight
		DC at 20 °C	AC at 70 °C	Laid Direct in Ground	Laid in Ducts	Laid in Free Air		
	mm^2	Ω/km	Ω/km	A	A	A	mm	kg/km
				Two Core Cables				
CP1-T102-A09	6 rm	3.0800	3.6900	50	40	50	16.9	460
CP1-T102-A10	10 rm	1.8300	2.1900	65	55	66	17.0	560
CP1-T102-A11	16 rm	1.1500	1.3900	85	65	88	19.0	740
CP1-T102-A12	25 rm	0.7270	0.8700	110	85	116	22.0	1030
CP1-T102-A13	35 rm	0.5240	0.6280	130	105	143	24.2	1295
				Three Core Cables				
CP1-T103-A08	4 rm	4.6100	5.5400	35	30	31	16.4	440
CP1-T103-A09	6 rm	3.0800	3.6900	45	36	39	17.5	525
CP1-T103-A10	10 rm	1.8300	2.1900	60	48	53	18.4	640
CP1-T103-A11	16 rm	1.1500	1.3900	75	60	72	20.6	860
CP1-T103-A12	25 rm	0.7270	0.8700	100	80	94	23.8	1200
CP1-T103-A13	35 rm	0.5240	0.6280	120	95	110	26.2	1530
				Four Core Cables				
CP1-T104-A08	4 rm	4.6100	5.5400	35	30	31	17.6	520
CP1-T104-A09	6 rm	3.0800	3.6900	45	36	39	18.8	630
CP1-T104-A10	10 rm	1.8300	2.1900	60	48	53	19.9	805
CP1-T104-A11	16 rm	1.1500	1.3900	75	60	72	22.3	1070
CP1-T104-A12	25 rm	0.7270	0.8700	100	80	94	25.9	1520
CP1-T104-A13	35 rm	0.5240	0.6280	120	95	110	28.6	1950
CP1-T104-A14	50 sm	0.3870	0.4640	145	115	138	32.7	2640
CP1-T104-A15	70 sm	0.2680	0.3220	175	145	171	37.5	3915
CP1-T104-A16	95 sm	0.1930	0.2320	210	165	209	42.4	5140
CP1-T104-A17	120 sm	0.1530	0.1850	240	195	242	46.2	6310
CP1-T104-A18	150 sm	0.1240	0.1510	270	220	275	50.9	7615
CP1-T104-A19	185 sm	0.0991	0.1210	300	245	314	56.1	9365
CP1-T104-A20	240 sm	0.0754	0.0840	345	290	374	62.6	12790
CP1-T104-A30	300 sm	0.0601	0.0770	390	320	440	68.7	14645
CP1-T104-A40	400 sm	0.0470	0.0606	444	373	500	74.9	18510
CP1-T104-A50	500 sm	0.0366	0.0491	499	425	556	83.8	23700

contd

Multicore Cables, with Stranded Copper Conductors, PVC Insulated, Steel Tape Armoured and PVC Sheathed

Product - Code	Nominal Cross Sectional Area		Max. Conductor Resistance		Current Rating			Approx. Overall Diameter	Approx. Weight
			DC at 20 °C	AC at 70 °C	Laid Direct in Ground	Laid in Ducts	Laid in Free Air		
	mm^2		Ω/km	Ω/km	A	A	A	mm	kg/km
Four Core Cables with Reduced Neutral									
CP1-T105-A13	35 rm	16 rm	0.5240/1.1500	0.6280/1.3900	120	95	110	27.0	1740
CP1-T105-A14	50 sm	25 rm	0.3870/0.7270	0.4640/0.8700	145	115	138	30.9	2365
CP1-T105-A15	70 sm	35 rm	0.2680/0.5240	0.3220/0.6280	175	145	171	34.6	3155
CP1-T105-A16	95 sm	50 sm	0.1930/0.3870	0.2320/0.4640	210	165	209	40.7	4625
CP1-T105-A17	120 sm	70 sm	0.1530/0.2680	0.1850/0.3220	240	195	242	44.5	5730
CP1-T105-A18	150 sm	70 sm	0.1240/0.2680	0.1510/0.3220	270	220	275	48.5	6740
CP1-T105-A19	185 sm	95 sm	0.0991/0.1930	0.1210/0.2320	300	245	314	53.2	8300
CP1-T105-A20	240 sm	120 sm	0.0754/0.1530	0.0840/0.1850	345	290	374	59.6	10550
CP1-T105-A30	300 sm	150 sm	0.0601/0.1240	0.0770/0.1510	390	320	440	65.4	12920
CP1-T105-A40	400 sm	185 sm	0.0470/0.0991	0.0606/0.1210	444	373	500	70.8	16360
CP1-T105-A50	500 sm	240 sm	0.0366/0.0754	0.0491/0.0840	499	425	556	79.5	21000

The above data is approximate and subjected to manufacturing tolerance.

rm : round, Stranded
sm : Sector, Stranded

Multicore Cables, with Stranded Aluminium Conductors, PVC Insulated, Steel Tape Armoured and PVC Sheathed

Description

- Multicore cables of stranded Aluminium conductors are insulated with PVC compound rated 70°C, assembled together, armoured with steel tape and covered with overall jacket of PVC compound.
- Cables are produced according to IEC 60502.

Application

- For outdoor installations in damp wet locations, where mechanical damages are expected to occur.

Product - Code	Nominal Cross Sectional Area	Max. Conductor Resistance		Current Rating			Approx. Overall Diameter	Approx. Weight
		DC at 20 °C	AC at 70 °C	Laid Direct in Ground	Laid in Ducts	Laid in Free Air		
	mm^2	Ω/km	Ω/km	A	A	A	mm	kg/km
Two Core Cables								
AP1-T102-A10	10 rm	3.080	3.300	46	39	46	17.0	435
AP1-T102-A11	16 rm	1.910	2.290	60	46	62	19.0	545
AP1-T102-A12	25 rm	1.200	1.440	77	60	81	22.0	730
AP1-T102-A13	35 rm	0.868	1.040	103	83	115	24.2	880
Three Core Cables								
AP1-T103-A10	10 rm	3.080	3.300	42	34	37	18.4	460
AP1-T103-A11	16 rm	1.910	2.290	53	42	50	20.6	570
AP1-T103-A12	25 rm	1.200	1.440	70	56	66	23.8	750
AP1-T103-A13	35 rm	0.868	1.040	95	75	88	26.2	905
Four Core Cables								
AP1-T104-A10	10 rm	3.0800	3.3000	42	34	37	19.9	560
AP1-T104-A11	16 rm	1.9100	2.2900	53	42	50	22.3	680
AP1-T104-A12	25 rm	1.2000	1.4400	70	56	66	25.9	920
AP1-T104-A13	35 rm	0.8680	1.0430	95	75	88	28.6	1120
AP1-T104-A14	50 sm	0.6410	0.7710	115	85	105	32.7	1475
AP1-T104-A15	70 sm	0.4430	0.5530	135	110	132	37.5	2225
AP1-T104-A16	95 sm	0.3200	0.3850	165	130	160	42.4	2830
AP1-T104-A17	120 sm	0.2530	0.3050	185	150	187	46.2	3360
AP1-T104-A18	150 sm	0.2060	0.2490	210	170	215	50.9	3975
AP1-T104-A19	185 sm	0.1640	0.1990	235	195	248	56.1	4815
AP1-T104-A20	240 sm	0.1250	0.1510	275	225	292	62.6	5925
AP1-T104-A30	300 sm	0.1000	0.1230	310	260	347	68.7	7125
AP1-T104-A40	400 sm	0.0778	0.0962	355	298	399	74.9	8950
AP1-T104-A50	500 sm	0.0605	0.0761	406	346	452	83.8	11390

contd

Multicore Cables, with Stranded Aluminium Conductors, PVC Insulated, Steel Tape Armoured and PVC Sheathed

Product - Code	Nominal Cross Sectional Area		Max. Conductor Resistance		Current Rating			Approx. Overall Diameter	Approx. Weight
			DC at 20 °C	AC at 70 °C	Laid Direct in Ground	Laid in Ducts	Laid in Free Air		
	mm^2		Ω/km	Ω/km	A	A	A	mm	kg/km
Four Core Cables with Reduced Neutral									
AP1-T105-A13	35 rm	16 rm	0.8680/1.9100	1.0430/2.2900	95	75	88	27.0	1020
AP1-T105-A14	50 sm	25 rm	0.6410/1.2000	0.7710/1.4400	115	85	105	30.9	1330
AP1-T105-A15	70 sm	35 rm	0.4430/0.8680	0.5330/1.0400	135	110	132	34.6	1675
AP1-T105-A16	95 sm	50 sm	0.3200/0.6410	0.3850/0.7710	165	130	160	40.7	2585
AP1-T105-A17	120 sm	70 sm	0.2530/0.4430	0.3050/0.5330	185	150	187	44.5	3100
AP1-T105-A18	150 sm	70 sm	0.2060/0.4430	0.2490/0.5330	210	170	215	48.5	3590
AP1-T105-A19	185 sm	95 sm	0.1640/0.3200	0.1990/0.3850	235	195	248	53.2	4300
AP1-T105-A20	240 sm	120 sm	0.1250/0.2530	0.1510/0.3050	275	225	292	59.6	5325
AP1-T105-A30	300 sm	150 sm	0.1000/0.2060	0.1230/0.2490	310	260	347	65.4	6365
AP1-T105-A40	400 sm	185 sm	0.0778/0.1640	0.0962/0.1990	355	298	399	70.8	8000
AP1-T105-A50	500 sm	240 sm	0.0605/0.1250	0.0761/0.1510	406	346	452	79.5	10250

The above data is approximate and subjected to manufacturing tolerance.

rm : round, Stranded
sm : Sector, Stranded

Multicore Cables, with Stranded Copper Conductors,
PVC Insulated, Steel Wire Armoured and PVC Sheathed

Description

- Multicore cables of stranded Copper conductors are insulated with PVC compound rated 70°C, assembled together, armoured with steel wires and covered with overall jacket of PVC compound.
- Cables are produced according to IEC 60502 or BS 6346.

Application

- For outdoor installations in damp wet locations where mechanical damages are expected to occur.

Product - Code	Nominal Cross Sectional Area	Max. Conductor Resistance		Current Rating			Approx. Overall Diameter	Approx. Weight
		DC at 20 °C	AC at 70 °C	Laid Direct in Ground	Laid in Ducts	Laid in Free Air		
	mm^2	Ω/km	Ω/km	A	A	A	mm	kg/km
				Two Core Cables				
CP1-T102-W08	4 rm	4.6100	5.5400	40	32	39	17.8	645
CP1-T102-W09	6 rm	3.0800	3.6900	50	40	50	18.8	735
CP1-T102-W10	10 rm	1.8300	2.1900	65	55	66	19.2	815
CP1-T102-W11	16 rm	1.1500	1.3900	85	65	88	21.2	1030
CP1-T102-W12	25 rm	0.7270	0.8700	110	85	116	25.3	1535
CP1-T102-W13	35 rm	0.5240	0.6280	130	105	143	27.5	1790
				Three Core Cables				
CP1-T103-W08	4 rm	4.6100	5.5400	35	30	31	18.5	730
CP1-T103-W09	6 rm	3.0800	3.6900	45	36	39	19.6	835
CP1-T103-W10	10 rm	1.8300	2.1900	60	48	53	20.6	920
CP1-T103-W11	16 rm	1.1500	1.3900	75	60	72	22.8	1175
CP1-T103-W12	25 rm	0.7270	0.8700	100	80	94	27.1	1765
CP1-T103-W13	35 rm	0.5240	0.6280	120	100	110	29.5	2145
				Four Core Cables				
CP1-T104-W08	4 rm	4.6100	5.5400	37	29	29	19.7	840
CP1-T104-W09	6 rm	3.0800	3.6900	47	37	37	20.9	965
CP1-T104-W10	10 rm	1.8300	2.1900	63	50	50	22.1	1115
CP1-T104-W11	16 rm	1.1500	1.3900	79	68	68	25.6	1590
CP1-T104-W12	25 rm	0.7270	0.8700	105	89	89	29.2	2125
CP1-T104-W13	35 rm	0.5240	0.6280	120	95	116	32.1	2635
CP1-T104-W14	50 sm	0.3870	0.4640	145	115	143	37.1	3870
CP1-T104-W15	70 sm	0.2680	0.3220	175	145	176	40.7	4900
CP1-T104-W16	95 sm	0.1930	0.2320	210	165	215	46.6	6665
CP1-T104-W17	120 sm	0.1530	0.1850	240	195	248	50.6	7990
CP1-T104-W18	150 sm	0.1240	0.1510	270	220	281	55.1	9445
CP1-T104-W19	185 sm	0.0991	0.1210	300	245	319	60.5	11425
CP1-T104-W20	240 sm	0.0754	0.0840	345	290	380	66.8	14205
CP1-T104-W30	300 sm	0.0601	0.0770	390	320	446	72.9	17870
CP1-T104-W40	400 sm	0.0470	0.0606	427	361	490	80.0	21275
CP1-T104-W50	500 sm	0.0366	0.0491	472	403	536	87.7	26595

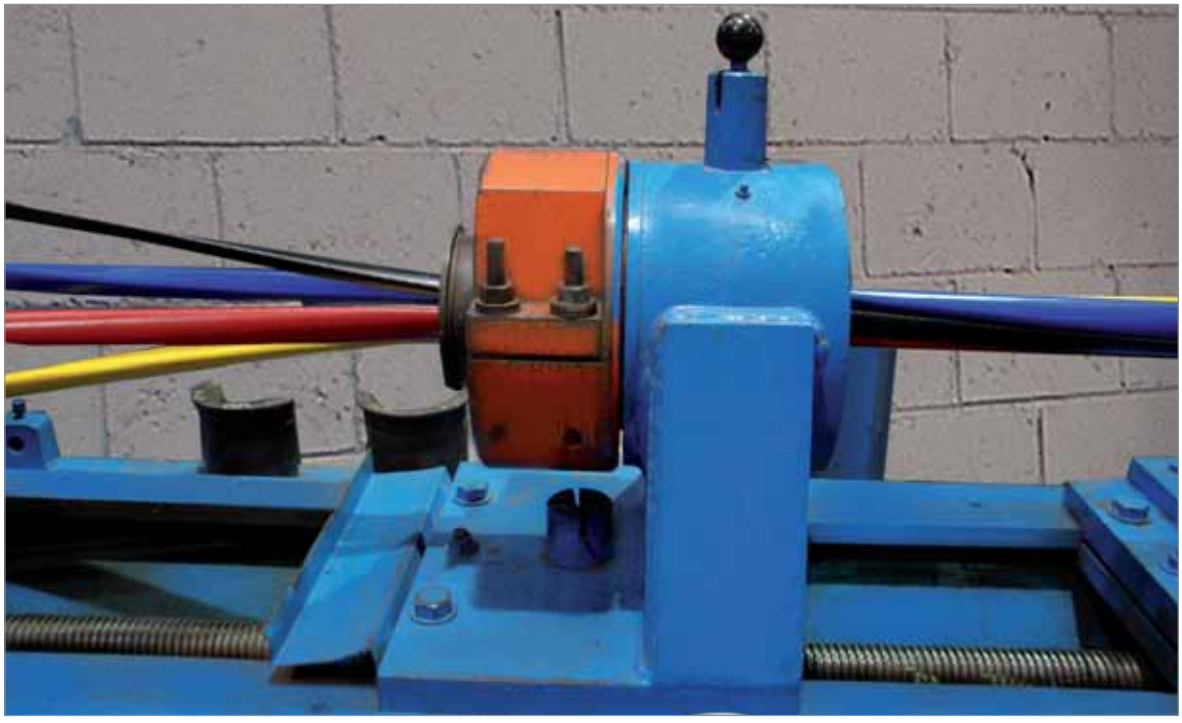
contd

Multicore Cables with Stranded Copper Conductors, PVC Insulated, Steel Wire Armoured and PVC Sheathed

Product - Code	Nominal Cross Sectional Area		Max. Conductor Resistance		Current Rating			Approx. Overall Diameter	Approx. Weight
			DC at 20 °C	AC at 70 °C	Laid Direct in Ground	Laid in Ducts	Laid in Free Air		
	mm^2		Ω/km	Ω/km	A	A	A	mm	kg/km
Four Core Cables with Reduced Neutral									
CP1-T105-W13	35 rm	16 rm	0.5240/1.1500	0.6280/1.3900	120	95	116	28.7	2310
CP1-T105-W14	50 sm	25 rm	0.3870/0.7270	0.4640/0.8700	145	115	143	35.5	3550
CP1-T105-W15	70 sm	35 rm	0.2680/0.5240	0.3220/0.6280	175	145	176	39.2	4480
CP1-T105-W16	95 sm	50 sm	0.1930/0.3870	0.2320/0.4640	210	165	215	42.6	5475
CP1-T105-W17	120 sm	70 sm	0.1530/0.2680	0.1850/0.3220	240	195	248	48.9	7385
CP1-T105-W18	150 sm	70 sm	0.1240/0.2680	0.1510/0.3220	270	220	281	52.7	8505
CP1-T105-W19	185 sm	95 sm	0.0991/0.1930	0.1210/0.2320	300	245	319	57.6	10260
CP1-T105-W20	240 sm	120 sm	0.0754/0.1530	0.0840/0.1850	345	290	380	64.0	12755
CP1-T105-W30	300 sm	150 sm	0.0601/0.1240	0.0770/0.1510	390	320	446	69.8	15330
CP1-T105-W40	400 sm	185 sm	0.0470/0.0991	0.0606/0.1210	427	361	490	75.9	19260
CP1-T105-W50	500 sm	240 sm	0.0366/0.0754	0.0491/0.0840	472	403	536	83.4	23630

The above data is approximate and subjected to manufacturing tolerance.

rm : round, Stranded
sm : Sector, Stranded



Multicore Cables, with Stranded Aluminium Conductors, PVC Insulated, Steel Wire Armoured and PVC Sheathed

Description

- Multicore cables of stranded Aluminium conductors are insulated with PVC compound rated 70°C, assembled together, armoured with steel wires and covered with overall jacket of PVC compound.
- Cables are produced according to IEC 60502 or BS 6346.

Application

- For outdoor installations in damp wet locations where mechanical damages are expected to occur.

Product - Code	Nominal Cross Sectional Area	Max. Conductor Resistance		Current Rating			Approx. Overall Diameter	Approx. Weight
		DC at 20 °C	AC at 70 °C	Laid Direct in Ground	Laid in Ducts	Laid in Free Air		
	mm^2	Ω/km	Ω/km	A	A	A	mm	kg/km
Two Core Cables								
AP1-T102-W10	10 rm	3.0800	3.3000	46	39	46	19.2	695
AP1-T102-W11	16 rm	1.9100	2.2900	60	46	62	21.2	835
AP1-T102-W12	25 rm	1.2000	1.4400	77	60	81	25.3	1235
AP1-T102-W13	35 rm	0.8680	1.0400	103	83	115	27.5	1370
Three Core Cables								
AP1-T103-W10	10 rm	3.0800	3.3000	42	34	37	20.6	740
AP1-T103-W11	16 rm	1.9100	2.2900	53	42	50	22.8	885
AP1-T103-W12	25 rm	1.2000	1.4400	70	56	66	27.1	1315
AP1-T103-W13	35 rm	0.8680	1.0400	95	75	88	29.5	1525
Four Core Cables								
AP1-T104-W10	10 rm	3.0800	3.3000	42	34	37	22.1	870
AP1-T104-W11	16 rm	1.9100	2.2900	53	42	50	25.6	1205
AP1-T104-W12	25 rm	1.2000	1.4400	70	56	66	29.2	1525
AP1-T104-W13	35 rm	0.8680	1.0430	95	75	88	32.1	1805
AP1-T104-W14	50 sm	0.6410	0.7710	115	85	105	37.1	3040
AP1-T104-W15	70 sm	0.4430	0.5530	135	110	138	40.7	3750
AP1-T104-W16	95 sm	0.3200	0.3850	165	130	165	46.6	4730
AP1-T104-W17	120 sm	0.2530	0.3050	185	150	193	50.6	5570
AP1-T104-W18	150 sm	0.2060	0.2490	210	170	220	55.1	6430
AP1-T104-W19	185 sm	0.1640	0.1990	235	195	253	60.5	7790
AP1-T104-W20	240 sm	0.1250	0.1510	275	225	297	66.8	9180
AP1-T104-W30	300 sm	0.1000	0.1230	310	260	352	72.9	10590
AP1-T104-W40	400 sm	0.0778	0.0962	348	294	397	80.0	11715
AP1-T104-W50	500 sm	0.0605	0.0761	392	335	443	87.7	14005

The above data is approximate and subjected to manufacturing tolerance.

rm : round, Stranded
sm : Sector, Stranded

0.6/1 (1.2) kV

Multicore Cables, with Stranded Aluminium Conductors, PVC Insulated, Steel Wire Armoured and PVC Sheathed

Product - Code	Nominal Cross Sectional Area		Max. Conductor Resistance		Current Rating			Approx. Overall Diameter	Approx. Weight
			DC at 20 °C	AC at 70 °C	Laid Direct in Ground	Laid in Ducts	Laid in Free Air		
	mm^2		Ω/km	Ω/km	A	A	A	mm	kg/km
Four Core Cables with Reduced Neutral									
AP1-T105-W13	35 rm	16 rm	0.8680/1.9100	1.0430/2.2900	95	75	94	28.7	1585
AP1-T105-W14	50 sm	25 rm	0.6410/1.2000	0.7710/1.4400	115	85	110	35.5	2300
AP1-T105-W15	70 sm	35 rm	0.4430/0.8680	0.5330/1.0400	135	110	138	39.2	2820
AP1-T105-W16	95 sm	50 sm	0.3200/0.6410	0.3850/0.7710	165	130	165	42.6	3410
AP1-T105-W17	120 sm	70 sm	0.2530/0.4430	0.3050/0.5330	185	150	193	48.9	4370
AP1-T105-W18	150 sm	70 sm	0.2060/0.4430	0.2490/0.5330	210	170	220	52.7	5080
AP1-T105-W19	185 sm	95 sm	0.1640/0.3200	0.1990/0.3850	235	195	253	57.6	5950
AP1-T105-W20	240 sm	120 sm	0.1250/0.2530	0.1510/0.3050	275	225	297	64.0	7230
AP1-T105-W30	300 sm	150 sm	0.1000/0.2060	0.1230/0.2490	310	260	352	69.8	8540
AP1-T105-W40	400 sm	185 sm	0.0778/0.1640	0.0962/0.1990	348	294	397	75.9	10870
AP1-T105-W50	500 sm	240 sm	0.0605/0.1250	0.0761/0.1510	392	335	443	83.4	12650

The above data is approximate and subjected to manufacturing tolerance.

rm : round, Stranded
sm : Sector, Stranded

Single Core Cables, with Stranded Circular Copper Conductors, XLPE Insulated and PVC Sheathed

Description

- Soft annealed stranded Copper or Aluminium conductor, Insulated with XLPE compound covered with a layer of PVC compound to form the overall jacket.
- Cables are according to IEC 60502 or BS 7889.

Application

- For outdoor and indoor installations in damp and wet locations.
  They are normally used for power distribution in urban networks, in industrial plants, as well as in Thermopower and Hydropower stations.

Product - Code	Nominal Cross Sectional Area	Max. Conductor Resistance		Current Rating						Approx. Overall Diameter	Approx. Weight
		DC at 20 °C	AC at 90 °C	Laid in Ground			Laid in Free Air				
				⊙⊙⊙	⊙⊙	⊙	⊙	⊙⊙⊙	⊙⊙		
	mm^2	Ω/km	Ω/km	A	A	A	A	A	A	mm	kg/km
a - Copper Conductors											
CX1-T101-U08	4	4.6100	5.8800	55	51	40	53	47	40	6.8	80
CX1-T101-U09	6	3.0800	3.9300	68	65	53	65	59	53	7.3	102
CX1-T101-U10	10	1.8300	2.3300	98	86	68	84	79	68	8.3	150
CX1-T101-U11	16	1.1500	1.4700	116	111	87	116	110	95	9.3	210
CX1-T101-U12	25	0.7270	0.9270	150	142	110	143	137	121	11.0	315
CX1-T101-U13	35	0.5240	0.6690	179	172	137	179	173	152	12.1	410
CX1-T101-U14	50	0.3870	0.4940	210	200	163	221	210	184	13.8	555
CX1-T101-U15	70	0.2680	0.3430	263	247	200	278	268	236	15.7	760
CX1-T101-U16	95	0.1930	0.2480	310	294	242	347	336	289	17.7	1015
CX1-T101-U17	120	0.1530	0.1970	357	336	273	404	394	341	19.6	1280
CX1-T101-U18	150	0.1240	0.1600	394	373	310	457	446	389	21.8	1570
CX1-T101-U19	185	0.0991	0.1290	452	425	352	530	520	441	23.9	1920
CX1-T101-U20	240	0.0754	0.0990	520	488	404	651	641	536	27.1	2530
CX1-T101-U30	300	0.0601	0.0810	588	546	457	824	756	620	29.7	3105
CX1-T101-U40	400	0.0470	0.0638	672	620	515	893	872	714	33.9	4135
CX1-T101-U50	500	0.0366	0.0517	761	693	572	1008	987	814	37.4	5110
CX1-T101-U60	630	0.0283	0.0425	872	777	651	1155	1134	956	41.9	6455
CX1-T101-U70	800	0.0221	0.0292	957	861	735	1313	1292	1092	46.8	8260
CX1-T101-U80	1000	0.0176	0.0234	1082	935	798	1449	1428	1208	51.5	10075

contd

0.6/1 (1.2) kV

Single Core Cables, with Stranded Circular Aluminium Conductors, XLPE Insulated and PVC Sheathed

Product - Code	Nominal Cross Sectional Area	Max. Conductor Resistance		Current Rating						Approx. Overall Diameter	Approx. Weight
		DC at 20 °C	AC at 90 °C	Laid in Ground			Laid in Free Air				
				⊙⊙⊙	⊙⊙⊙	⊙⊙⊙	⊙	⊙⊙⊙	⊙⊙⊙		
	mm²	Ω/km	Ω/km	A	A	A	A	A	A	mm	kg/km
b - Aluminium Conductors											
AX1-T101-U11	16	1.9100	2.4500	89	87	66	89	84	63	9.3	115
AX1-T101-U12	25	1.2000	1.5400	113	110	84	116	110	95	11.0	165
AX1-T101-U13	35	0.8680	1.1130	137	131	105	142	137	121	12.1	205
AX1-T101-U14	50	0.6410	0.8220	163	155	121	173	168	147	13.8	260
AX1-T101-U15	70	0.4430	0.5690	200	189	152	221	215	179	15.7	340
AX1-T101-U16	95	0.3200	0.4110	236	226	179	284	273	215	17.7	450
AX1-T101-U17	120	0.2530	0.3250	278	263	215	326	315	242	19.6	550
AX1-T101-U18	150	0.2060	0.2650	310	294	236	373	362	299	21.8	670
AX1-T101-U19	185	0.1640	0.2120	352	336	267	436	420	336	23.9	830
AX1-T101-U20	240	0.1250	0.1630	410	389	315	515	499	399	27.1	1050
AX1-T101-U30	300	0.1000	0.1310	467	436	357	578	567	462	29.7	1300
AX1-T101-U40	400	0.0778	0.1000	541	504	410	693	677	541	33.9	1610
AX1-T101-U50	500	0.0605	0.0870	609	567	467	809	788	630	37.4	2000
AX1-T101-U60	630	0.0469	0.0620	698	646	536	945	924	746	41.9	2520
AX1-T101-U70	800	0.0367	0.0560	788	704	599	1071	1050	851	46.8	3150
AX1-T101-U80	1000	0.0291	0.0470	872	767	651	1176	1155	966	51.5	3870

The above data is approximate and subjected to manufacturing tolerance.

Multicore Cables, with Stranded, Copper Conductors, XLPE Insulated and PVC Sheathed

Description

- Multicore cables of stranded Copper conductors are insulated with XLPE compound, assembled together and covered with an overall jacket of PVC compound.
- Cables are produced according to IEC 60502.

Application

- For outdoor and indoor installations in damp and wet locations. They are normally used for power distribution in urban networks, in industrial plants, as well as in Thermopower and Hydropower Stations.

Product - Code	Nominal Cross Sectional Area	Max. Conductor Resistance		Current Rating			Approx. Overall Diameter	Approx. Weight
		DC at 20 °C	AC at 90 °C	Laid Direct in Ground	Laid in Ducts	Laid in Free Air		
	mm^2	Ω/km	Ω/km	A	A	A	mm	kg/km
Two Core Cables								
CX1-T102-U04	1.5 rm	12.1000	15.4000	30	25	25	9.6	105
CX1-T102-U06	2.5 rm	7.4100	9.4500	37	32	34	10.5	135
CX1-T102-U08	4 rm	4.6100	5.8800	50	40	46	11.7	175
CX1-T102-U09	6 rm	3.0800	3.9300	63	52	60	12.7	225
CX1-T102-U10	10 rm	1.8300	2.3300	82	69	79	13.8	360
CX1-T102-U11	16 rm	1.1500	1.4700	106	83	105	15.8	505
CX1-T102-U12	25 rm	0.7270	0.9270	139	107	139	18.8	750
CX1-T102-U13	35 rm	0.5240	0.6690	166	134	166	21.0	980
Three Core Cables								
CX1-T103-U04	1.5 rm	12.1000	15.4000	26	23	22	10.1	130
CX1-T103-U06	2.5 rm	7.4100	9.4500	35	29	32	11.0	165
CX1-T103-U08	4 rm	4.6100	5.8800	45	36	41	12.3	225
CX1-T103-U09	6 rm	3.0800	3.9300	57	45	50	13.4	295
CX1-T103-U10	10 rm	1.8300	2.3300	75	60	68	15.1	430
CX1-T103-U11	16 rm	1.1500	1.4700	97	75	89	17.3	620
CX1-T103-U12	25 rm	0.7270	0.9270	128	102	120	20.5	910
CX1-T103-U13	35 rm	0.5240	0.6690	155	120	145	22.9	1205

contd

Multicore Cables with Stranded, Copper Conductors, XLPE Insulated and PVC Sheathed

Product - Code	Nominal Cross Sectional Area		Max. Conductor Resistance		Current Rating			Approx. Overall Diameter	Approx. Weight
			DC at 20 °C	AC at 90 °C	Laid Direct in Ground	Laid in Ducts	Laid in Free Air		
	mm^2		Ω/km	Ω/km	A	A	A	mm	kg/km
				Four Core Cables					
CX1-T104-U04	1.5	rm	12.1000	15.4000	26	23	22	10.6	150
CX1-T104-U06	2.5	rm	7.4100	9.4500	35	29	32	11.9	205
CX1-T104-U08	4	rm	4.6100	5.8800	45	36	41	13.4	280
CX1-T104-U09	6	rm	3.0800	3.9300	57	45	50	14.6	365
CX1-T104-U10	10	rm	1.8300	2.3300	75	60	68	16.4	565
CX1-T104-U11	16	rm	1.1500	1.4700	97	75	89	18.9	795
CX1-T104-U12	25	rm	0.7270	0.9270	128	102	120	22.5	1185
CX1-T104-U13	35	rm	0.5240	0.6690	155	120	145	25.2	1575
CX1-T104-U14	50	sm	0.3870	0.4940	185	145	179	27.1	2060
CX1-T104-U15	70	sm	0.2680	0.3430	220	180	225	31.4	2905
CX1-T104-U16	95	sm	0.1930	0.2480	265	210	268	35.1	3910
CX1-T104-U17	120	sm	0.1530	0.1970	305	245	310	39.2	4915
CX1-T104-U18	150	sm	0.1240	0.1600	335	275	352	43.7	6035
CX1-T104-U19	185	sm	0.0991	0.1290	375	310	404	48.7	7540
CX1-T104-U20	240	sm	0.0754	0.0990	435	365	483	54.5	9785
CX1-T104-U30	300	sm	0.0601	0.0810	490	405	562	60.1	12190
CX1-T104-U40	400	sm	0.0470	0.06420	579	476	660	66.9	15540
CX1-T104-U50	500	sm	0.0366	0.05190	653	546	762	74.4	20075
				Four Core Cables with Reduced Neutral					
CX1-T105-U13	35 rm	16 rm	0.5240/1.1500	0.6690/1.4700	155	120	142	23.6	1390
CX1-T105-U14	50 sm	25 rm	0.3870/0.7270	0.4940/0.9270	185	145	179	25.9	1835
CX1-T105-U15	70 sm	35 rm	0.2680/0.5240	0.3430/0.6690	220	180	215	29.7	2540
CX1-T105-U16	95 sm	50 sm	0.1930/0.3870	0.2480/0.4940	265	210	268	33.6	3435
CX1-T105-U17	120 sm	70 sm	0.1530/0.2680	0.1970/0.3430	305	245	310	37.5	4400
CX1-T105-U18	150 sm	70 sm	0.1240/0.2680	0.1600/0.3430	335	275	352	41.3	5255
CX1-T105-U19	185 sm	95 sm	0.0991/0.1930	0.1290/0.2480	375	310	404	46.2	6640
CX1-T105-U20	240 sm	120 sm	0.0754/0.1530	0.0990/0.1970	435	365	483	51.5	8555
CX1-T105-U30	300 sm	150 sm	0.0601/0.1240	0.0810/0.1600	490	405	562	56.8	10640
CX1-T105-U40	400 sm	185 sm	0.0470/0.0991	0.0642/0.1290	579	476	660	62.8	14436
CX1-T105-U50	500 sm	240 sm	0.0366/0.0754	0.0519/0.0990	653	546	762	70.1	18291

The above data is approximate and subjected to manufacturing tolerance.

rm : round, Stranded
sm : Sector, Stranded

Multicore Cables, with Stranded, Aluminum Conductors, XLPE Insulated and PVC Sheathed

Description

- Multicore cables of Stranded Aluminium conductors are insulated with XLPE compound, assembled together and covered with an overall jacket of PVC compound.
- Cables are produced according to IEC 60502.

Application

- For outdoor and indoor installations in damp and wet locations. They are normally used for power distribution in urban networks, in industrial plants, as well as in Thermopower and Hydropower Stations.

Product - Code	Nominal Cross Sectional Area	Max. Conductor Resistance		Current Rating			Approx. Overall Diameter	Approx. Weight
		DC at 20 °C	AC at 90 °C	Laid Direct in Ground	Laid in Ducts	Laid in Free Air		
	mm^2	Ω/km	Ω/km	A	A	A	mm	kg/km
Two Core Cables								
AX1-T102-U10	10 rm	3.0800	3.9500	57	48	55	13.8	235
AX1-T102-U11	16 rm	1.9100	2.4500	74	58	73	15.8	310
AX1-T102-U12	25 rm	1.2000	1.5400	97	75	97	18.8	450
AX1-T102-U13	35 rm	0.8680	1.1130	128	106	120	21.0	565
Three Core Cables								
AX1-T103-U10	10 rm	3.0800	3.9500	52	42	48	15.1	250
AX1-T103-U11	16 rm	1.9100	2.4500	68	52	62	17.3	330
AX1-T103-U12	25 rm	1.2000	1.5400	90	71	84	20.5	460
AX1-T103-U13	35 rm	0.8680	1.1130	120	95	105	22.9	580
Four Core Cables								
AX1-T104-U10	10 rm	3.0800	3.9500	52	42	48	16.4	320
AX1-T104-U11	16 rm	1.9100	2.4500	68	52	62	18.9	405
AX1-T104-U12	25 rm	1.2000	1.5400	90	71	84	22.5	585
AX1-T104-U13	35 rm	0.8680	1.1130	120	95	110	25.2	745
AX1-T104-U14	50 sm	0.6410	0.8220	145	110	136	26.5	905
AX1-T104-U15	70 sm	0.4430	0.5690	175	140	168	30.8	1260
AX1-T104-U16	95 sm	0.3200	0.4110	210	165	205	33.5	1565
AX1-T104-U17	120 sm	0.2530	0.3250	235	190	236	37.6	1950
AX1-T104-U18	150 sm	0.2060	0.2650	265	215	278	42.1	2405
AX1-T104-U19	185 sm	0.1640	0.2120	290	240	315	47.1	2930
AX1-T104-U20	240 sm	0.1250	0.1630	340	280	378	52.9	3725
AX1-T104-U30	300 sm	0.1000	0.1310	390	325	446	58.5	4625
AX1-T104-U40	400 sm	0.0778	0.1025	461	379	526	66.9	5975
AX1-T104-U50	500 sm	0.0605	0.0809	527	441	615	74.4	7485

The above data is approximate and subjected to manufacturing tolerance.

0.6/1 (1.2) kV

Multicore Cables, with Stranded, Aluminum Conductors, XLPE Insulated and PVC Sheathed

Product - Code	Nominal Cross Sectional Area		Max. Conductor Resistance		Current Rating			Approx. Overall Diameter	Approx. Weight
			DC at 20 °C	AC at 90 °C	Laid Direct in Ground	Laid in Ducts	Laid in Free Air		
	mm^2		Ω/km	Ω/km	A	A	A	mm	kg/km
Four Core Cables with Reduced Neutral									
AX1-T105-U13	35 rm	16 rm	0.8680/1.9100	1.1130/2.4500	120	95	110	23.6	670
AX1-T105-U14	50 sm	25 rm	0.6410/1.2000	0.8220/1.5400	145	110	136	25.3	830
AX1-T105-U15	70 sm	35 rm	0.4430/0.8680	0.5690/1.1130	175	140	168	29.1	1120
AX1-T105-U16	95 sm	50 sm	0.3200/0.6410	0.4110/0.8220	210	165	205	33.0	1415
AX1-T105-U17	120 sm	70 sm	0.2530/0.4430	0.3250/0.5690	235	190	236	35.9	1770
AX1-T105-U18	150 sm	70 sm	0.2060/0.4430	0.2650/0.5690	265	215	278	39.7	2120
AX1-T105-U19	185 sm	95 sm	0.1640/0.3200	0.2120/0.4110	290	240	315	44.6	2590
AX1-T105-U20	240 sm	120 sm	0.1250/0.2530	0.1630/0.3250	340	280	378	49.9	3260
AX1-T105-U30	300 sm	150 sm	0.1000/0.2060	0.1310/0.2650	390	325	446	55.2	4065
AX1-T105-U40	400 sm	185 sm	0.0778/0.1640	0.1025/0.2120	461	379	526	62.8	5255
AX1-T105-U50	500 sm	240 sm	0.0605/0.1250	0.0809/0.1630	527	441	615	70.1	6545

The above data is approximate and subjected to manufacturing tolerance.

Multicore Cables, with Stranded Copper Conductors, XLPE Insulated, Steel Tape Armoured and PVC Sheathed

Description

- Multicore cables of stranded Copper conductors are insulated with XLPE compound, assembled together, armoured with steel tape and covered with an overall jacket of PVC compound.
- Cables are produced according to IEC 60502.

Application

- For outdoor installations in damp wet locations where mechanical damages are expected to occur.

Product - Code	Nominal Cross Sectional Area	Max. Conductor Resistance		Current Rating			Approx. Overall Diameter	Approx. Weight
		DC at 20 °C	AC at 90 °C	Laid Direct in Ground	Laid in Ducts	Laid in Free Air		
	mm^2	Ω/km	Ω/km	A	A	A	mm	kg/km
Two Core Cables								
CX1-T102-A09	6 rm	3.0800	3.9300	62	51	59	15.5	405
CX1-T102-A10	10 rm	1.8300	2.3300	81	68	78	15.6	490
CX1-T102-A11	16 rm	1.1500	1.4700	105	82	103	17.8	655
CX1-T102-A12	25 rm	0.7270	0.9270	138	106	137	20.8	935
CX1-T102-A13	35 rm	0.5240	0.6690	164	132	164	23.0	1185
Three Core Cables								
CX1-T103-A09	6 rm	3.0800	3.9300	56	44	49	16.2	465
CX1-T103-A10	10 rm	1.8300	2.3300	74	59	67	17.1	575
CX1-T103-A11	16 rm	1.1500	1.4700	96	74	88	19.3	790
CX1-T103-A12	25 rm	0.7270	0.9270	127	100	120	22.5	1105
CX1-T103-A13	35 rm	0.5240	0.6690	153	119	143	24.9	1420
Four Core Cables								
CX1-T104-A09	6 rm	3.0800	3.9300	56	44	49	17.4	555
CX1-T104-A10	10 rm	1.8300	2.3300	74	59	67	18.4	720
CX1-T104-A11	16 rm	1.1500	1.4700	96	74	88	20.9	975
CX1-T104-A12	25 rm	0.7270	0.9270	127	100	120	24.5	1385
CX1-T104-A13	35 rm	0.5240	0.6690	153	119	143	27.2	1775
CX1-T104-A14	50 sm	0.3870	0.4940	185	145	178	30.1	2415
CX1-T104-A15	70 sm	0.2680	0.3430	220	180	215	34.6	3335
CX1-T104-A16	95 sm	0.1930	0.2480	265	210	268	39.7	4815
CX1-T104-A17	120 sm	0.1530	0.1970	305	245	310	43.8	5910
CX1-T104-A18	150 sm	0.1240	0.1600	335	275	352	48.7	7195
CX1-T104-A19	185 sm	0.0991	0.1290	375	310	404	53.7	8830
CX1-T104-A20	240 sm	0.0754	0.0990	435	365	483	60.0	11285
CX1-T104-A30	300 sm	0.0601	0.0810	490	405	562	65.5	13835
CX1-T104-A40	400 sm	0.0470	0.0642	567	472	645	71.7	17515
CX1-T104-A50	500 sm	0.0366	0.0519	614	524	746	80.6	22885

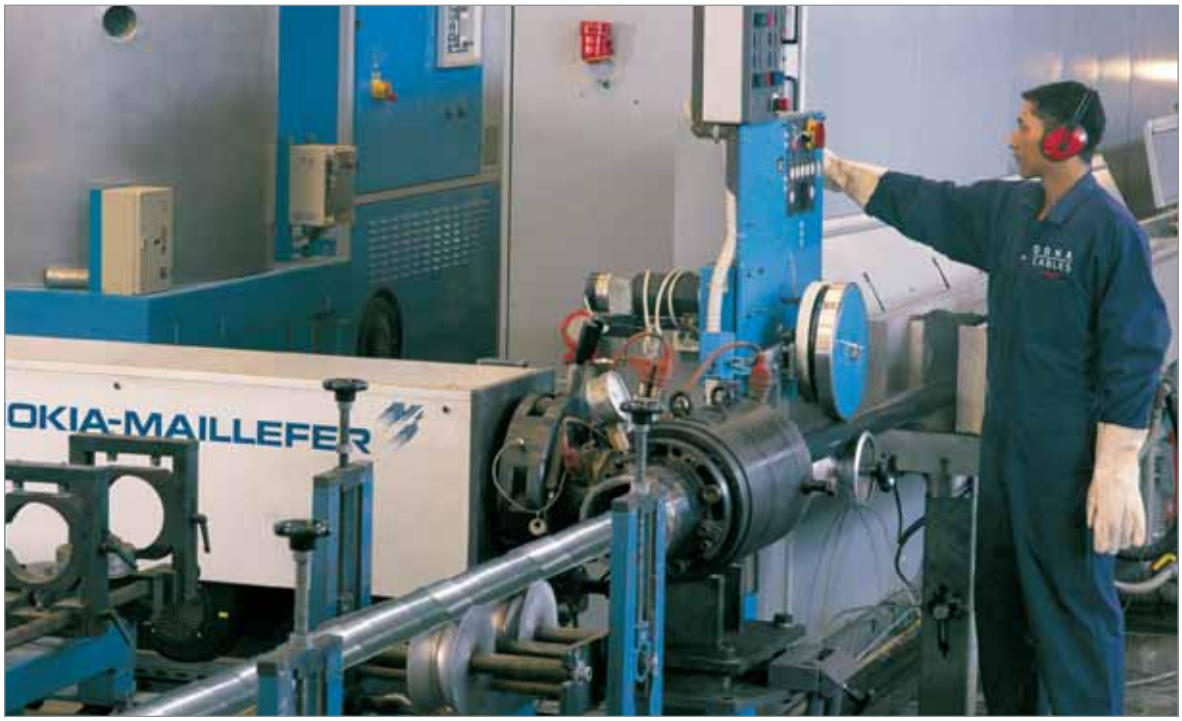
contd

Multicore Cables, with Stranded Copper Conductors, XLPE Insulated, Steel Tape Armoured and PVC Sheathed

Product - Code	Nominal Cross Sectional Area		Max. Conductor Resistance		Current Rating			Approx. Overall Diameter	Approx. Weight
			DC at 20 °C	AC at 90 °C	Laid Direct in Ground	Laid in Ducts	Laid in Free Air		
	mm^2		Ω/km	Ω/km	A	A	A	mm	kg/km
Four Core Cables with Reduced Neutral									
CX1-T105-A13	35 rm	16 rm	0.5240/1.1500	0.6690/1.4700	153	119	143	25.6	1615
CX1-T105-A14	50 sm	25 rm	0.3870/0.7270	0.4940/0.9270	185	145	178	28.7	2160
CX1-T105-A15	70 sm	35 rm	0.2680/0.5240	0.3430/0.6690	220	180	215	33.1	2960
CX1-T105-A16	95 sm	50 sm	0.1930/0.3870	0.2480/0.4940	265	210	268	38.0	4280
CX1-T105-A17	120 sm	70 sm	0.1530/0.2680	0.1970/0.3430	305	245	310	42.1	5365
CX1-T105-A18	150 sm	70 sm	0.1240/0.2680	0.1600/0.3430	335	275	352	46.3	6355
CX1-T105-A19	185 sm	95 sm	0.0991/0.1930	0.1290/0.2480	375	310	404	51.2	7865
CX1-T105-A20	240 sm	120 sm	0.0754/0.1530	0.0990/0.1970	435	365	483	57.1	10000
CX1-T105-A30	300 sm	150 sm	0.0601/0.1240	0.0810/0.1600	490	405	562	62.2	12205
CX1-T105-A40	400 sm	185 sm	0.0470/0.0991	0.0642/0.1290	567	472	645	67.8	15505
CX1-T105-A50	500 sm	240 sm	0.0366/0.0754	0.0519/0.0990	614	524	746	75.3	19515

The above data is approximate and subjected to manufacturing tolerance.

rm : round, Stranded
sm : Sector, Stranded



Multicore Cables, with Stranded Aluminium Conductors,
XLPE Insulated, Steel Tape Armoured and PVC Sheathed

Description

- Multicore cables of stranded Aluminium conductors are insulated with XLPE compound, assembled together, armoured with steel tape and covered with an overall jacket of PVC compound.
- Cables are produced according to IEC 60502.

Application

- For outdoor installations in damp wet locations where mechanical damages are expected to occur.

Product - Code	Nominal Cross Sectional Area	Max. Conductor Resistance		Current Rating			Approx. Overall Diameter	Approx. Weight
		DC at 20 °C	AC at 90 °C	Laid Direct in Ground	Laid in Ducts	Laid in Free Air		
	mm^2	Ω/km	Ω/km	A	A	A	mm	kg/km
Two Core Cables								
AX1-T102-A10	10 rm	3.0800	3.9500	56	47	55	15.8	370
AX1-T102-A11	16 rm	1.9100	2.4500	73	57	72	17.8	460
AX1-T102-A12	25 rm	1.2000	1.5400	96	74	96	20.8	630
AX1-T102-A13	35 rm	0.8680	1.1130	129	105	126	23.0	770
Three Core Cables								
AX1-T103-A10	10 rm	3.0800	3.9500	52	41	47	17.1	390
AX1-T103-A11	16 rm	1.9100	2.4500	67	52	62	19.3	495
AX1-T103-A12	25 rm	1.2000	1.5400	89	70	84	22.5	650
AX1-T103-A13	35 rm	0.8680	1.1130	120	95	110	24.9	795
Four Core Cables								
AX1-T104-A10	10 rm	3.0800	3.9500	52	41	47	18.4	475
AX1-T104-A11	16 rm	1.9100	2.4500	67	52	62	20.9	585
AX1-T104-A12	25 rm	1.2000	1.5400	89	70	84	24.5	780
AX1-T104-A13	35 rm	0.8680	1.1130	120	95	110	27.2	940
AX1-T104-A14	50 sm	0.6410	0.8220	145	110	136	30.1	1300
AX1-T104-A15	70 sm	0.4430	0.5690	175	140	168	34.6	1750
AX1-T104-A16	95 sm	0.3200	0.4110	210	165	205	39.7	2540
AX1-T104-A17	120 sm	0.2520	0.3250	235	190	236	43.8	3020
AX1-T104-A18	150 sm	0.2060	0.2650	265	215	278	48.7	3670
AX1-T104-A19	185 sm	0.1640	0.2120	290	240	315	53.7	4380
AX1-T104-A20	240 sm	0.1250	0.1630	340	280	378	60.0	4430
AX1-T104-A30	300 sm	0.1000	0.1310	390	325	446	65.5	6510
AX1-T104-A40	400 sm	0.0778	0.1025	453	377	515	71.7	7950
AX1-T104-A50	500 sm	0.0605	0.0809	498	425	604	80.6	10295

The above data is approximate and subjected to manufacturing tolerance.

Multicore Cables, with Stranded Aluminium Conductors, XLPE Insulated, Steel Tape Armoured and PVC Sheathed

Product - Code	Nominal Cross Sectional Area		Max. Conductor Resistance		Current Rating			Approx. Overall Diameter	Approx. Weight
			DC at 20 °C	AC at 90 °C	Laid Direct in Ground	Laid in Ducts	Laid in Free Air		
	mm^2		Ω/km	Ω/km	A	A	A	mm	kg/km
Four Core Cables with Reduced Neutral									
AX1-T105-A13	35 rm	16 rm	0.8680/1.9100	1.1130/2.4500	120	95	110	25.6	890
AX1-T105-A14	50 sm	25 rm	0.6410/1.2000	0.8220/1.5400	145	110	136	28.7	1200
AX1-T105-A15	70 sm	35 rm	0.4430/0.8680	0.5690/1.1130	175	140	168	33.1	1550
AX1-T105-A16	95 sm	50 sm	0.3200/0.6410	0.4110/0.8220	210	165	205	38.0	1970
AX1-T105-A17	120 sm	70 sm	0.2530/0.4430	0.3250/0.5690	235	190	236	42.1	2710
AX1-T105-A18	150 sm	70 sm	0.2060/0.4430	0.2650/0.5690	265	215	278	46.3	3290
AX1-T105-A19	185 sm	95 sm	0.1640/0.3200	0.2120/0.4110	290	240	315	51.2	3980
AX1-T105-A20	240 sm	120 sm	0.1250/0.2530	0.1630/0.3250	340	280	378	57.1	4910
AX1-T105-A30	300 sm	150 sm	0.1000/0.2060	0.1310/0.2650	390	325	446	62.2	5920
AX1-T105-A40	400 sm	185 sm	0.0778/0.1640	0.1025/0.2120	453	377	515	67.6	7110
AX1-T105-A50	500 sm	240 sm	0.0605/0.1250	0.0809/0.1630	498	425	604	74.9	8515

The above data is approximate and subjected to manufacturing tolerance.

Multicore Cables, with Stranded Copper Conductors, XLPE Insulated, Steel Wire Armoured and PVC Sheathed

Description

- Multicore cables of stranded Copper conductors are insulated with XLPE compound, assembled together, armoured with steel wires and covered with an overall jacket of PVC compound.
- Cables are produced according to IEC 60502 or BS 5467

Application

- For outdoor installations in damp wet locations where mechanical damages are expected to occur.

Product - Code	Nominal Cross Sectional Area	Max. Conductor Resistance		Current Rating			Approx. Overall Diameter	Approx. Weight
		DC at 20 °C	AC at 90 °C	Laid Direct in Ground	Laid in Ducts	Laid in Free Air		
	mm^2	Ω/km	Ω/km	A	A	A	mm	kg/km
Two Core Cables								
CX1-T102-W08	4 rm	4.6100	5.8800	51	41	47	16.6	580
CX1-T102-W09	6 rm	3.0800	3.9300	64	53	61	17.6	660
CX1-T102-W10	10 rm	1.8300	2.3300	83	70	80	18.0	730
CX1-T102-W11	16 rm	1.1500	1.4700	107	84	106	20.0	925
CX1-T102-W12	25 rm	0.7270	0.9270	140	108	140	24.1	1410
CX1-T102-W13	35 rm	0.5240	0.6690	168	135	168	26.3	1715
Three Core Cables								
CX1-T103-W08	4 rm	4.6100	5.8800	46	37	42	17.2	650
CX1-T103-W09	6 rm	3.0800	3.9300	58	46	51	18.3	755
CX1-T103-W10	10 rm	1.8300	2.3300	76	61	69	19.3	825
CX1-T103-W11	16 rm	1.1500	1.4700	98	76	90	21.5	1070
CX1-T103-W12	25 rm	0.7270	0.9270	130	103	120	25.8	1620
CX1-T103-W13	35 rm	0.5240	0.6690	158	122	147	28.2	1990
Four Core Cables								
CX1-T104-W08	4 rm	4.6100	5.8800	46	37	42	18.3	740
CX1-T104-W09	6 rm	3.0800	3.9300	58	46	51	19.5	860
CX1-T104-W10	10 rm	1.8300	2.3300	76	61	69	20.6	990
CX1-T104-W11	16 rm	1.1500	1.4700	98	76	90	24.2	1450
CX1-T104-W12	25 rm	0.7270	0.9270	130	103	122	27.8	1975
CX1-T104-W13	35 rm	0.5240	0.6690	158	122	147	30.7	2465
CX1-T104-W14	50 sm	0.3870	0.4940	185	145	184	33.1	3200
CX1-T104-W15	70 sm	0.2680	0.3430	220	180	220	39.2	4645
CX1-T104-W16	95 sm	0.1930	0.2480	265	210	273	42.9	5870
CX1-T104-W17	120 sm	0.1530	0.1970	305	245	315	48.4	7555
CX1-T104-W18	150 sm	0.1240	0.1600	335	275	375	53.1	8985
CX1-T104-W19	185 sm	0.0991	0.1290	375	310	410	57.9	10760
CX1-T104-W20	240 sm	0.0754	0.0990	435	365	488	64.1	13480
CX1-T104-W30	300 sm	0.0601	0.0810	490	405	562	69.7	16215
CX1-T104-W40	400 sm	0.0470	0.0642	547	459	634	76.8	20190
CX1-T104-W50	500 sm	0.0366	0.0519	605	514	716	84.5	25375

The above data is approximate and subjected to manufacturing tolerance.

contd

Multicore Cables, with Stranded Copper Conductors, XLPE Insulated, Steel Wire Armoured and PVC Sheathed

Product - Code	Nominal Cross Sectional Area		Max. Conductor Resistance		Current Rating			Approx. Overall Diameter	Approx. Weight
			DC at 20 °C	AC at 90 °C	Laid Direct in Ground	Laid in Ducts	Laid in Free Air		
	mm^2		Ω/km	Ω/km	A	A	A	mm	kg/km
Four Core Cables with Reduced Neutral									
CX1-T105-W13	35 rm	16 rm	0.5240/1.1500	0.6690/1.4700	158	122	147	28.9	2210
CX1-T105-W14	50 sm	25 rm	0.3870/0.7270	0.4940/0.9270	185	145	184	31.3	2860
CX1-T105-W15	70 sm	35 rm	0.2680/0.5240	0.3430/0.6690	220	180	220	37.5	4240
CX1-T105-W16	95 sm	50 sm	0.1930/0.3870	0.2480/0.4940	265	210	273	41.2	5290
CX1-T105-W17	120 sm	70 sm	0.1530/0.2680	0.1970/0.3430	305	245	315	45.3	6475
CX1-T105-W18	150 sm	70 sm	0.1240/0.2680	0.1600/0.3430	335	275	375	50.5	8055
CX1-T105-W19	185 sm	95 sm	0.0991/0.1930	0.1290/0.2480	375	310	410	55.4	9735
CX1-T105-W20	240 sm	120 sm	0.0754/0.1530	0.0990/0.1970	435	365	488	60.3	11780
CX1-T105-W30	300 sm	150 sm	0.0601/0.1240	0.0810/0.1600	490	405	562	66.4	14435
CX1-T105-W40	400 sm	185 sm	0.0470/0.0991	0.0642/0.1290	547	459	634	72.7	18500
CX1-T105-W50	500 sm	240 sm	0.0366/0.0754	0.0519/0.0990	605	514	716	80.2	22575

The above data is approximate and subjected to manufacturing tolerance.

rm : Round, Stranded
sm : Sector, Stranded

Multicore Cables, with Stranded, Aluminium Conductors, XLPE Insulated, Steel Wire Armoured and PVC Sheathed

Description

- Multicore cables of stranded Aluminium conductors are insulated with XLPE compound, assembled together, armoured with steel wire and covered with an overall jacket of PVC compound.
- Cables are produced according to IEC 60502 or BS 5467

Application

- For outdoor installations in damp wet locations where mechanical damages are expected to occur.

Product - Code	Nominal Cross Sectional Area	Max. Conductor Resistance		Current Rating			Approx. Overall Diameter	Approx. Weight
		DC at 20 °C	AC at 90 °C	Laid Direct in Ground	Laid in Ducts	Laid in Free Air		
	mm^2	Ω/km	Ω/km	A	A	A	mm	kg/km
Two Core Cables								
AX1-T102-W10	10 rm	3.0800	3.9500	56	47	60	18.0	610
AX1-T102-W11	16 rm	1.9100	2.4500	73	57	79	20.0	735
AX1-T102-W12	25 rm	1.2000	1.5400	96	74	101	24.1	1110
AX1-T102-W13	35 rm	0.8680	1.1130	129	105	131	26.3	1300
Three Core Cables								
AX1-T103-W10	10 rm	3.0800	3.9500	52	41	52	19.3	645
AX1-T103-W11	16 rm	1.9100	2.4500	67	52	67	21.5	780
AX1-T103-W12	25 rm	1.2000	1.5400	89	70	89	25.8	1170
AX1-T103-W13	35 rm	0.8680	1.1130	120	95	115	28.2	1365
Four Core Cables								
AX1-T104-W10	10 rm	3.0800	3.9500	52	41	52	20.6	750
AX1-T104-W11	16 rm	1.9100	2.4500	67	52	67	24.2	1060
AX1-T104-W12	25 rm	1.2000	1.5400	89	70	89	27.8	1370
AX1-T104-W13	35 rm	0.8680	1.1130	120	95	115	30.7	1635
AX1-T104-W14	50 sm	0.6410	0.8220	145	110	141	33.1	2330
AX1-T104-W15	70 sm	0.4430	0.5690	175	140	173	39.2	2760
AX1-T104-W16	95 sm	0.3200	0.4110	210	165	210	42.9	3340
AX1-T104-W17	120 sm	0.2520	0.3250	235	190	241	48.4	4320
AX1-T104-W18	150 sm	0.2060	0.2650	265	215	283	53.1	5080
AX1-T104-W19	185 sm	0.1640	0.2120	290	240	320	57.9	5990
AX1-T104-W20	240 sm	0.1250	0.1630	340	280	383	64.1	7220
AX1-T104-W30	300 sm	0.1000	0.1310	390	325	451	69.7	8440
AX1-T104-W40	400 sm	0.0778	0.1025	444	373	513	76.8	10630
AX1-T104-W50	500 sm	0.0605	0.0809	500	426	591	84.5	12785

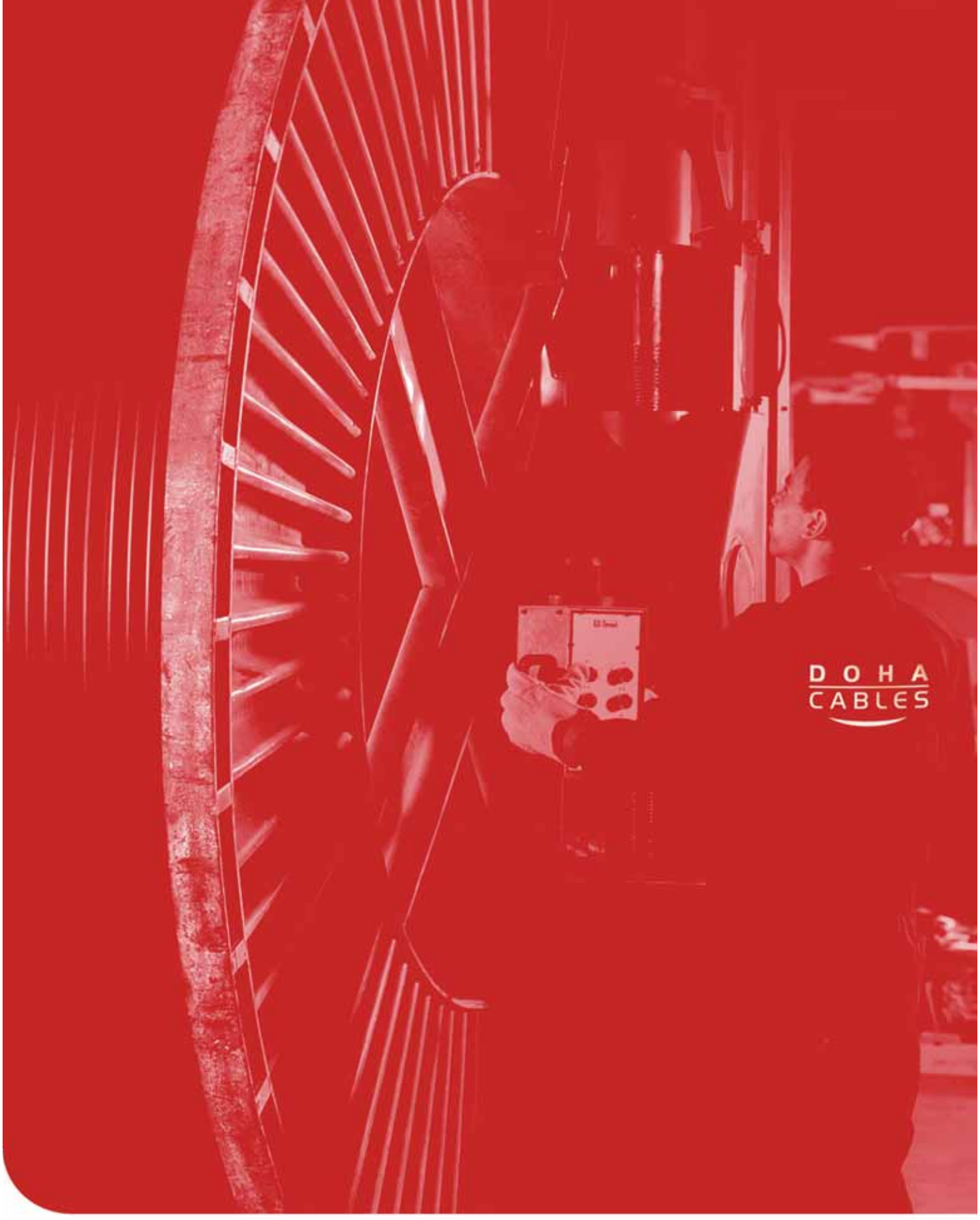
The above data is approximate and subjected to manufacturing tolerance.

Multicore Cables, with Stranded, Aluminium Conductors, XLPE Insulated, Steel Wire Armoured and PVC Sheathed

Product - Code	Nominal Cross Sectional Area		Max. Conductor Resistance		Current Rating			Approx. Overall Diameter	Approx. Weight
			DC at 20 °C	AC at 90 °C	Laid Direct in Ground	Laid in Ducts	Laid in Free Air		
	mm^2		Ω/km	Ω/km	A	A	A	mm	kg/km
Four Core Cables with Reduced Neutral									
AX1-T105-W13	35 rm	16 rm	0.8680/1.9100	1.1130/2.4500	120	95	115	28.9	1490
AX1-T105-W14	50 sm	25 rm	0.6410/1.2000	0.8220/1.5400	145	110	141	31.3	1870
AX1-T105-W15	70 sm	35 rm	0.4430/0.8680	0.5690/1.1130	175	140	173	37.5	2600
AX1-T105-W16	95 sm	50 sm	0.3200/0.6410	0.4110/0.8220	210	165	210	41.2	3090
AX1-T105-W17	120 sm	70 sm	0.2530/0.4430	0.3250/0.5690	235	190	241	45.3	3690
AX1-T105-W18	150 sm	70 sm	0.2060/0.4430	0.2650/0.5690	265	215	283	50.5	4700
AX1-T105-W19	185 sm	95 sm	0.1640/0.3200	0.2120/0.4110	290	240	320	55.4	5550
AX1-T105-W20	240 sm	120 sm	0.1250/0.2530	0.1630/0.3250	340	280	383	60.3	6560
AX1-T105-W30	300 sm	150 sm	0.1000/0.2060	0.1310/0.2650	390	325	451	66.4	7820
AX1-T105-W40	400 sm	185 sm	0.0778/0.1640	0.1025/0.2120	444	373	513	72.7	9845
AX1-T105-W50	500 sm	240 sm	0.0605/0.1250	0.0809/0.1630	500	426	591	80.2	11620

The above data is approximate and subject to manufacturing tolerance.

rm : Round, Stranded
sm : Sector, Stranded


DOHA
CABLES

Operating Voltage

(from 6/10 kV up to 18/30 kV)

Cable Construction

1. Conductor

Stranded, round and compacted Copper or Aluminium conductors, according to IEC 60228 - class 2.

2. Conductor Screen

An extruded layer of semi conducting material applied over the conductor as voltage stress control layer.

3. Insulation

An extruded layer of cross linked polyethylene (XLPE) is applied over the inner semi conductor with thickness as specified in IEC 60502.

4. Insulation Screen

An extruded layer of strippable or firmly bonded to the insulation. Conductor screen, XLPE insulation and insulation screen are applied at the same time using triple head extruder.

5. Metallic Screen

a. Copper Tape: an annealed Copper tape is applied helically with a suitable overlap.

b. Copper Wire: helically applied and binded with a Copper tape to achieve electrical contact

6. Assembly

In case of three core cables, cores are assembled together with suitable lay length, non-hygroscopic filler is applied during assembly to fill spaces between cores then wrapped with suitable binder tape.

7. Bedding

in case of armoured cables an extruded layer of PVC or MDPE or LLDPE is applied as bedding.

8. Armouring

a. Steel Tape: double layers of steel tapes are applied helically.

b. Steel Wire: galvanized steel wires are applied helically.

9. Sheath

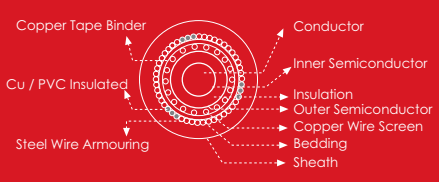
An extruded layer of PVC is applied with thickness as specified in IEC 60502.

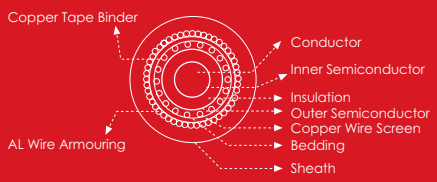
Option

Lead Sheath: Upon request a layer of lead is extruded over the bedding layer.

Armouring of Single Core Cable

1. Armouring by non-magnetic material either Aluminium Tape armouring or Aluminium Wire armouring to reduce the magnetic losses.
2. If it is required for single core cable to be armoured by steel wire armouring, the magnetic circuit around the single core cable should be interrupted by inserting insulated copper wires between the steel wires.





3.2

System Designation for Medium Voltage Cable

You can order our product by giving the following information:

1. Cable code as per the catalogue.
2. If your required cable/conductor is out of our catalogue range, you can use the following codes to determine your cable.

Conductor

C Copper
A Aluminium
D Copper+Swelling Powder
B Tinned Copper

Insulation

X XLPE

Voltage

A	1.8/3 kV	(3.6) kV
B	3.6/6 kV	(7.2) kV
2	6/10 kV	(12) kV
3	8.7/15 kV	(17.5) kV
4	12/20 kV	(24) kV
5	18/30 kV	(36) kV

Conductor Type

T Stranded

Sheathing

1 Single Sheath
A PVC+Flame Retardant
X HDPE
Z PVC+Anti Termite
L LSHF
M PVC+2.5 % Carbon Black
S PVC+Flame Retardant +Low Smoke
B PVC+Flame Retardant +Anti Termite

No. of Cores

01 Single Core
03 Three Cores

Code	mm²	Code	mm²
12	25	20	240
13	35	30	300
14	50	40	400
15	70	50	500
16	95	60	630
17	120	70	800
18	150	80	1000
19	185	81	1200

Armouring

U Unarmoured
L Lead
N Lead Alloy
A Steel Tape
B Aluminium Tape
W Steel Wire
X Aluminium Wire
C Lead+Steel Tape
D Lead+Steel Wire
G Galvanized Steel Tape
O Steel Wire+Copper Wire
H Steel Wire+Copper Wire+Lead
T Lead+Aluminium Wire
P Lead+Aluminium Tape

6/10 (12) kV

Single & Three Cores Copper Conductors XLPE Insulated and PVC Sheathed

Description

- Stranded circular compacted Copper conductor, semiconducting layer as conductor screen, XLPE insulated, semiconducting layer as non metallic insulation screen, Copper tape or wire as metallic insulation screen, three cores assembled together with non hygroscopic Polypropylene fillers, wrapped with binder tape and PVC sheathed.
- Cables are produced according to IEC 60502 or BS 6622.

Application

- These cables are generally suitable for direct burial or for installation on trays or in ducts.

Product - Code	Nominal Cross Sectional Area	Max. Conductor Resistance		Operating Capacitance	Inductance		Current Rating				Approx. Overall Diameter	Approx. Weight
							Laid in Ground		Laid in Free Air			
		DC at 20 °C	AC at 90 °C		Trefoil	Flat	Trefoil	Flat	Trefoil	Flat		
	mm^2	Ω/km	Ω/km	µf/km	mh/km	mh/km	A	A	A	A	mm	kg/km
Single Core Cable												
CX2-T101-U12	25	0.7270	0.9271	0.200	0.450	0.635	139	145	143	173	20.0	665
CX2-T101-U13	35	0.5240	0.6683	0.224	0.426	0.611	166	174	174	211	21.1	770
CX2-T101-U14	50	0.3870	0.4937	0.251	0.393	0.578	197	206	209	255	22.5	905
CX2-T101-U15	70	0.2680	0.3420	0.291	0.370	0.554	242	252	262	319	24.3	1135
CX2-T101-U16	95	0.1930	0.2465	0.316	0.357	0.542	287	299	317	384	25.5	1390
CX2-T101-U17	120	0.1530	0.1956	0.345	0.344	0.529	326	339	366	443	26.9	1655
CX2-T101-U18	150	0.1240	0.1588	0.374	0.336	0.521	364	375	416	498	28.7	2015
CX2-T101-U19	185	0.0991	0.1272	0.409	0.322	0.507	411	422	478	570	30.4	2390
CX2-T101-U20	240	0.0754	0.0973	0.456	0.310	0.494	475	484	565	669	33.0	2950
CX2-T101-U30	300	0.0601	0.0781	0.512	0.301	0.487	535	542	650	765	35.8	3590
CX2-T101-U40	400	0.0470	0.0618	0.565	0.292	0.477	599	591	745	853	38.6	4510
CX2-T101-U50	500	0.0366	0.0490	0.635	0.282	0.467	674	659	859	975	42.2	5610
CX2-T101-U60	630	0.0283	0.0391	0.704	0.275	0.460	752	728	981	1103	45.9	6940
CX2-T101-U70	800	0.0221	0.0319	0.795	0.268	0.453	869	979	1160	1480	50.8	9195
CX2-T101-U80	1000	0.0176	0.0234	0.983	0.266	0.451	1084	1188	1515	1864	61.2	11105
Three Core Cables												
CX2-T103-U12	25	0.7270	0.9271	0.200	0.403	-	140	-	141	-	37.7	1795
CX2-T103-U13	35	0.5240	0.6684	0.224	0.382	-	167	-	171	-	40.3	2150
CX2-T103-U14	50	0.3870	0.4938	0.251	0.351	-	197	-	206	-	43.5	2655
CX2-T103-U15	70	0.2680	0.3423	0.291	0.330	-	241	-	257	-	47.2	3390
CX2-T103-U16	95	0.1930	0.2469	0.316	0.316	-	286	-	309	-	50.0	4165
CX2-T103-U17	120	0.1530	0.1961	0.345	0.309	-	325	-	356	-	53.6	5140
CX2-T103-U18	150	0.1240	0.1595	0.374	0.302	-	364	-	405	-	56.9	5965
CX2-T103-U19	185	0.0991	0.1282	0.409	0.290	-	410	-	463	-	60.9	7210
CX2-T103-U20	240	0.0754	0.0986	0.456	0.280	-	475	-	546	-	66.3	9020
CX2-T103-U30	300	0.0601	0.0799	0.512	0.271	-	535	-	626	-	71.9	11095

This data is applicable for 6.35 / 11 kV cables.
The ampacity for single core sizes 800 & 1000mm^2 was based on a single end bonding.
The above data is approximate and subjected to manufacturing tolerance.

Single & Three Cores Aluminium Conductors, XLPE Insulated and PVC Sheathed

Description

- Stranded circular compacted Aluminium conductor, semiconducting layer as conductor screen, XLPE insulated, semiconducting layer as non metallic insulation screen, Copper tape or wire as metallic insulation screen, three cores assembled together with non hygroscopic Polypropylene fillers, wrapped with binder tape and PVC sheathed.
- Cables are produced according to IEC 60502 or BS 6622.

Application

- These cables are generally suitable for direct burial or for installation on trays or in ducts.

Product - Code	Nominal Cross Sectional Area	Max. Conductor Resistance		Operating Capacitance	Inductance		Current Rating				Approx. Overall Diameter	Approx. Weight
		DC at 20 °C	AC at 90 °C		Trefoil	Flat	Laid in Ground		Laid in Free Air			
							Trefoil	Flat	Trefoil	Flat		
	mm^2	Ω/km	Ω/km	µf/km	mh/km	mh/km	A	A	A	A	mm	kg/km
Single Core Cable												
AX2-T101-U12	25	1.2000	1.5390	0.200	0.450	0.635	108	113	111	135	20.0	510
AX2-T101-U13	35	0.8680	1.1130	0.224	0.426	0.611	129	135	135	164	21.1	560
AX2-T101-U14	50	0.6410	0.8220	0.251	0.393	0.578	153	160	162	198	22.4	610
AX2-T101-U15	70	0.4430	0.5681	0.291	0.370	0.554	188	196	204	248	24.0	715
AX2-T101-U16	95	0.3200	0.4105	0.316	0.357	0.542	222	233	246	299	25.5	815
AX2-T101-U17	120	0.2530	0.3247	0.345	0.344	0.529	254	265	284	346	26.9	915
AX2-T101-U18	150	0.2060	0.2645	0.374	0.336	0.521	283	295	324	391	28.7	1115
AX2-T101-U19	185	0.1640	0.2107	0.409	0.322	0.507	321	333	373	449	30.4	1250
AX2-T101-U20	240	0.1250	0.1610	0.456	0.310	0.494	372	385	443	530	32.9	1475
AX2-T101-U30	300	0.1000	0.1291	0.512	0.301	0.487	421	433	511	608	35.5	1700
AX2-T101-U40	400	0.0778	0.1009	0.565	0.292	0.477	478	483	593	693	38.6	2120
AX2-T101-U50	500	0.0605	0.0791	0.635	0.282	0.467	544	545	693	802	42.2	2505
AX2-T101-U60	630	0.0469	0.0621	0.704	0.275	0.460	617	612	803	921	45.8	3000
AX2-T101-U70	800	0.0367	0.0495	0.795	0.268	0.453	715	786	954	1188	50.8	3670
AX2-T101-U80	1000	0.0291	0.0376	0.983	0.266	0.451	862	937	1205	1468	61.2	4755
Three Core Cables												
AX2-T103-U12	25	1.2000	1.5390	0.200	0.403	-	108	-	110	-	37.7	1335
AX2-T103-U13	35	0.8680	1.1130	0.224	0.382	-	129	-	133	-	40.3	1530
AX2-T103-U14	50	0.6410	0.8220	0.251	0.351	-	153	-	160	-	42.9	1800
AX2-T103-U15	70	0.4430	0.5683	0.291	0.330	-	187	-	200	-	46.5	2100
AX2-T103-U16	95	0.3200	0.4107	0.316	0.316	-	222	-	240	-	50.0	2440
AX2-T103-U17	120	0.2530	0.3250	0.345	0.309	-	253	-	277	-	53.2	2780
AX2-T103-U18	150	0.2060	0.2649	0.374	0.302	-	283	-	314	-	56.9	3280
AX2-T103-U19	185	0.1640	0.2114	0.409	0.290	-	320	-	361	-	60.9	3790
AX2-T103-U20	240	0.1250	0.1618	0.456	0.280	-	371	-	427	-	66.1	4555
AX2-T103-U30	300	0.1000	0.1302	0.512	0.271	-	420	-	491	-	71.3	5360

This data is applicable for 6.35 / 11 kV cables
The ampacity for single core sizes 800 & 1000mm2 was based on a single end bonding.
The above data is approximate and subjected to manufacturing tolerance.

Three Cores Copper or Aluminium Conductors, XLPE Insulated, Steel Tape Armoured and PVC Sheathed

Description

- Stranded circular compacted Copper or Aluminium conductor, semiconducting layer as conductor screen, XLPE insulated, semiconducting layer as non metallic insulation screen, Copper tape or wire as metallic insulation screen, three cores assembled together with non hygroscopic polypropylene fillers, wrapped with binder tape, covered with a layer of PVC compound as a bedding, steel tape armoured and PVC sheathed.
- Cables are produced according to IEC 60502.

Application

- These cables are generally suitable for direct burial or for installation on trays or in ducts.

Product - Code	Nominal Cross Sectional Area	Max. Conductor Resistance		Operating Capacitance	Inductance	Current Rating		Approx. Overall Diameter	Approx. Weight
		DC at 20 °C	AC at 90 °C			Laid in Ground	Laid in Free Air		
	mm^2	Ω/km	Ω/km	μf/km	mh/km	A	A	mm	kg/km
Three Cores, Copper Conductor Cables									
CX2-T103-A12	25	0.7270	0.9271	0.200	0.403	132	133	41.9	2625
CX2-T103-A13	35	0.5240	0.6684	0.224	0.382	157	160	44.5	3035
CX2-T103-A14	50	0.3870	0.4938	0.251	0.352	185	192	47.9	3625
CX2-T103-A15	70	0.2680	0.3423	0.291	0.330	226	237	51.8	4470
CX2-T103-A16	95	0.1930	0.2469	0.316	0.316	269	286	54.6	5305
CX2-T103-A17	120	0.1530	0.1961	0.345	0.311	306	328	57.8	6205
CX2-T103-A18	150	0.1240	0.1595	0.374	0.302	342	371	61.7	7290
CX2-T103-A19	185	0.0991	0.1282	0.409	0.290	386	424	65.5	8595
CX2-T103-A20	240	0.0754	0.0986	0.456	0.280	446	497	71.3	10595
CX2-T103-A30	300	0.0601	0.0799	0.512	0.272	502	566	77.1	12835
Three Cores, Aluminium Conductor Cables									
AX2-T103-A12	25	1.2000	1.5390	0.200	0.403	102	103	41.9	2165
AX2-T103-A13	35	0.8680	1.1130	0.224	0.382	122	124	44.5	2410
AX2-T103-A14	50	0.6410	0.8220	0.251	0.351	144	149	47.3	2760
AX2-T103-A15	70	0.4430	0.5683	0.291	0.330	176	184	51.1	3170
AX2-T103-A16	95	0.3200	0.4107	0.316	0.316	209	222	54.6	3585
AX2-T103-A17	120	0.2530	0.3250	0.345	0.309	238	255	57.8	3995
AX2-T103-A18	150	0.2060	0.2649	0.374	0.302	266	288	61.7	4605
AX2-T103-A19	185	0.1640	0.2114	0.409	0.290	301	331	65.5	5175
AX2-T103-A20	240	0.1250	0.1618	0.456	0.280	349	389	71.1	6120
AX2-T103-A30	300	0.1000	0.1302	0.512	0.271	394	444	76.5	7085

This data is applicable for 6.35 / 11 kV cables
The above data is approximate and subjected to manufacturing tolerance.

6/10 (12) kV

Three Cores Copper or Aluminium Conductors, XLPE Insulated, Steel Wire Armoured and PVC Sheathed

Description

- Stranded circular compacted Copper or Aluminium conductor, semiconducting layer as conductor screen, XLPE insulated, semiconducting layer as non metallic insulation screen,Copper tape or wire as metallic insulation screen, three cores assembled together with non hygroscopic Polypropylene fillers, wrapped with binder tape, covered with a layer of PVC compound as a bedding, steel wire armoured and PVC sheathed.
- Cables are produced according to IEC 60502 or BS 6622.

Application

- These cables are generally suitable for direct burial or for installation on trays or in ducts.

Product - Code	Nominal Cross Sectional Area	Max. Conductor Resistance		Operating Capacitance	Inductance	Current Rating		Approx. Overall Diameter	Approx. Weight
		DC at 20 °C	AC at 90 °C			Laid in Ground	Laid in Free Air		
	mm^2	Ω/km	Ω/km	µf/km	mh/km	A	A	mm	kg/km
Three Cores, Copper Conductor Cables									
CX2-T103-W12	25	0.7270	0.9271	0.200	0.403	133	136	45.1	3910
CX2-T103-W13	35	0.5240	0.6684	0.224	0.382	158	164	47.7	4410
CX2-T103-W14	50	0.3870	0.4938	0.251	0.352	187	195	51.1	5085
CX2-T103-W15	70	0.2680	0.3423	0.291	0.330	227	241	55.0	6000
CX2-T103-W16	95	0.1930	0.2469	0.316	0.316	269	289	57.8	6920
CX2-T103-W17	120	0.1530	0.1961	0.345	0.311	305	331	61.4	8090
CX2-T103-W18	150	0.1240	0.1595	0.374	0.302	340	372	64.9	9130
CX2-T103-W19	185	0.0991	0.1282	0.409	0.290	381	423	68.9	10630
CX2-T103-W20	240	0.0754	0.0986	0.456	0.280	436	494	76.6	13700
CX2-T103-W30	300	0.0601	0.0799	0.512	0.272	485	556	82.2	16165
Three Cores, Aluminium Conductor Cables									
AX2-T103-W12	25	1.2000	1.5390	0.200	0.403	103	106	45.1	3415
AX2-T103-W13	35	0.8680	1.1130	0.224	0.382	123	127	47.7	3750
AX2-T103-W14	50	0.6410	0.8220	0.251	0.351	145	152	50.5	4185
AX2-T103-W15	70	0.4430	0.5683	0.291	0.330	177	188	54.3	4705
AX2-T103-W16	95	0.3200	0.4107	0.316	0.316	210	225	57.8	5195
AX2-T103-W17	120	0.2530	0.3250	0.345	0.309	238	259	61.0	5725
AX2-T103-W18	150	0.2060	0.2649	0.374	0.302	265	291	64.9	6445
AX2-T103-W19	185	0.1640	0.2114	0.409	0.290	300	332	68.9	7160
AX2-T103-W20	240	0.1250	0.1618	0.456	0.280	346	391	76.4	9130
AX2-T103-W30	300	0.1000	0.1302	0.512	0.271	387	442	81.6	10315

This data is applicable for 6.35 / 11 kV cables
The above data is approximate and subjected to manufacturing tolerance.

8.7/15 (17.5) kV

Single & Three Cores Copper Conductors,
XLPE Insulated and PVC Sheathed

Description

- Stranded circular compacted Copper conductor, semiconducting layer as conductor screen, XLPE insulated, semiconducting layer as non metallic insulation screen, Copper tape or wire as metallic insulation screen, three cores assembled together with non hygroscopic Polypropylene fillers, wrapped with binder tape and PVC sheathed.
- Cables are produced according to IEC 60502 or BS 6622.

Application

- These cables are generally suitable for direct burial or for installation on trays or in ducts.

Product - Code	Nominal Cross Sectional Area	Max. Conductor Resistance		Operating Capacitance	Inductance		Current Rating				Approx. Overall Diameter	Approx. Weight
		DC at 20 °C	AC at 90 °C		Trefoil	Flat	Laid in Ground		Laid in Free Air			
							Trefoil	Flat	Trefoil	Flat		
	mm^2	Ω/km	Ω/km	µf/km	mh/km	mh/km	A	A	A	A	mm	kg/km
Single Core Cable												
CX3-T101-U12	25	0.7270	0.9271	0.165	0.469	0.654	139	145	143	173	22.0	729
CX3-T101-U13	35	0.5240	0.6683	0.183	0.446	0.631	166	174	174	211	23.3	846
CX3-T101-U14	50	0.3870	0.4937	0.204	0.412	0.597	197	206	209	255	24.7	999
CX3-T101-U15	70	0.2680	0.3420	0.234	0.387	0.572	242	252	262	319	26.5	1230
CX3-T101-U16	95	0.1930	0.2465	0.253	0.373	0.558	287	299	317	384	27.7	1479
CX3-T101-U17	120	0.1530	0.1956	0.275	0.361	0.546	326	339	366	443	29.3	1761
CX3-T101-U18	150	0.1240	0.1588	0.297	0.351	0.536	364	375	416	498	30.9	2111
CX3-T101-U19	185	0.0991	0.1272	0.324	0.338	0.522	411	422	478	570	32.8	2512
CX3-T101-U20	240	0.0754	0.0973	0.360	0.324	0.509	475	484	565	669	35.4	3083
CX3-T101-U30	300	0.0601	0.0781	0.402	0.313	0.498	535	542	650	765	38.0	3718
CX3-T101-U40	400	0.0470	0.0618	0.442	0.304	0.489	599	591	745	853	41.0	4661
CX3-T101-U50	500	0.0366	0.0490	0.495	0.293	0.478	674	659	859	975	44.6	5808
CX3-T101-U60	630	0.0283	0.0391	0.548	0.285	0.470	752	728	981	1103	48.3	7127
CX3-T101-U70	800	0.0221	0.0319	0.616	0.277	0.462	869	979	1160	1480	53.2	9010
CX3-T101-U80	1000	0.0176	0.0234	0.759	0.274	0.459	1084	1188	1515	1864	63.6	11341
Three Core Cables												
CX3-T103-U12	25	0.7270	0.9271	0.165	0.431	-	140	-	141	-	42.9	2105
CX3-T103-U13	35	0.5240	0.6684	0.183	0.408	-	167	-	171	-	45.5	2485
CX3-T103-U14	50	0.3870	0.4938	0.204	0.376	-	197	-	206	-	48.3	2990
CX3-T103-U15	70	0.2680	0.3423	0.234	0.354	-	241	-	257	-	52.3	3725
CX3-T103-U16	95	0.1930	0.2469	0.253	0.340	-	286	-	309	-	55.1	4505
CX3-T103-U17	120	0.1530	0.1961	0.275	0.329	-	325	-	356	-	58.4	5410
CX3-T103-U18	150	0.1240	0.1595	0.297	0.320	-	364	-	405	-	62.0	6415
CX3-T103-U19	185	0.0991	0.1282	0.324	0.308	-	410	-	463	-	65.9	7685
CX3-T103-U20	240	0.0754	0.0986	0.360	0.295	-	475	-	546	-	71.0	9540
CX3-T103-U30	300	0.0601	0.0799	0.402	0.288	-	535	-	626	-	76.9	11590

The ampacity for single core sizes 800 & 1000mm2 was based on a single end bonding.
The above data is approximate and subjected to manufacturing tolerance.

8.7/15 (17.5) kV

Single & Three Cores Aluminium Conductors, XLPE Insulated and PVC Sheathed

Description

- Stranded circular compacted Aluminium conductor, semiconducting layer as conductor screen, XLPE insulated, semiconducting layer as non metallic insulation screen, Copper tape or wire as metallic insulation screen, three cores assembled together with non hygroscopic Polypropylene fillers, wrapped with binder tape and PVC sheathed.
- Cables are produced according to IEC 60502 or BS 6622.

Application

- These cables are generally suitable for direct burial or for installation on trays or in ducts.

Product - Code	Nominal Cross Sectional Area	Max. Conductor Resistance		Operating Capacitance	Inductance		Current Rating				Approx. Overall Diameter	Approx. Weight
							Laid in Ground		Laid in Free Air			
		DC at 20 °C	AC at 90 °C		Trefoil	Flat	Trefoil	Flat	Trefoil	Flat		
	mm^2	Ω/km	Ω/km	µf/km	mh/km	mh/km	A	A	A	A	mm	kg/km
Single Core Cable												
AX3-T101-U12	25	1.2000	1.5390	0.165	0.469	0.654	108	113	111	135	22.0	575
AX3-T101-U13	35	0.8680	1.1130	0.183	0.446	0.631	129	135	135	164	23.3	635
AX3-T101-U14	50	0.6410	0.8220	0.204	0.412	0.597	153	160	162	198	24.6	700
AX3-T101-U15	70	0.4430	0.5681	0.234	0.387	0.572	188	196	204	248	26.2	800
AX3-T101-U16	95	0.3200	0.4105	0.253	0.373	0.558	222	233	246	299	27.7	905
AX3-T101-U17	120	0.2530	0.3247	0.275	0.361	0.546	254	265	284	346	29.3	1020
AX3-T101-U18	150	0.2060	0.2645	0.297	0.351	0.536	283	295	324	391	30.9	1215
AX3-T101-U19	185	0.1640	0.2107	0.324	0338	0.522	321	333	373	449	32.8	1370
AX3-T101-U20	240	0.1250	0.1610	0.360	0.324	0.509	372	385	443	530	35.3	1595
AX3-T101-U30	300	0.1000	0.1291	0.402	0.313	0.498	421	433	511	608	37.7	1825
AX3-T101-U40	400	0.0778	0.1009	0.442	0.304	0.489	478	483	593	693	41.0	2270
AX3-T101-U50	500	0.0605	0.0791	0.495	0.293	0.478	544	545	693	802	44.6	2670
AX3-T101-U60	630	0.0469	0.0621	0.548	0.288	0.470	617	612	803	921	48.2	3180
AX3-T101-U70	800	0.0367	0.0495	0.616	0.277	0.462	715	786	954	1188	53.2	3870
AX3-T101-U80	1000	0.0291	0.0376	0.759	0.274	0.459	862	937	1205	1468	63.6	4990
Three Core Cables												
AX3-T103-U12	25	1.2000	1.5390	0.165	0.431	-	108	-	110	-	42.5	1605
AX3-T103-U13	35	0.8680	1.1130	0.183	0.408	-	129	-	133	-	45.1	1815
AX3-T103-U14	50	0.6410	0.8220	0.204	0.376	-	153	-	160	-	47.6	2040
AX3-T103-U15	70	0.4430	0.5683	0.234	0.354	-	187	-	200	-	51.3	2375
AX3-T103-U16	95	0.3200	0.4107	0.253	0.340	-	222	-	240	-	54.7	2730
AX3-T103-U17	120	0.2530	0.3250	0.275	0.329	-	253	-	277	-	58.0	3120
AX3-T103-U18	150	0.2060	0.2649	0.297	0.320	-	283	-	314	-	61.6	3645
AX3-T103-U19	185	0.1640	0.2114	0.324	0.308	-	320	-	361	-	65.7	4205
AX3-T103-U20	240	0.1250	0.1618	0.360	0.295	-	371	-	427	-	70.4	4975
AX3-T103-U30	300	0.1000	0.1302	0.402	0.288	-	420	-	491	-	76.0	5775

The ampacity for single core sizes 800 & 1000mm2 was based on a single end bonding.
The above data is approximate and subjected to manufacturing tolerance.

8.7/15 (17.5) kV

Three Cores Copper or Aluminium Conductors, XLPE Insulated, Steel Tape Armoured and PVC Sheathed

Description

- Stranded circular compacted Copper or Aluminium conductor, semiconducting layer as conductor screen, XLPE insulated, semiconducting layer as non metallic insulation screen, Copper tape or wire as metallic insulation screen, three cores assembled together with non hygroscopic Polypropylene fillers, wrapped with binder tape, covered with a layer of PVC compound as a bedding, steel tape armoured and PVC sheathed.
- Cables are produced according to IEC 60502.

Application

- These cables are generally suitable for direct burial or for installation on trays or in ducts.

Product - Code	Nominal Cross Sectional Area	Max. Conductor Resistance		Operating Capacitance	Inductance	Current Rating		Approx. Overall Diameter	Approx. Weight
		DC at 20 °C	AC at 90 °C			Laid in Ground	Laid in Free Air		
	mm^2	Ω/km	Ω/km	µf/km	mh/km	A	A	mm	kg/km
Three Cores, Copper Conductor Cables									
CX3-T103-A12	25	0.7270	0.9271	0.165	0.431	140	141	47.3	3070
CX3-T103-A13	35	0.5240	0.6684	0.183	0.408	167	171	49.7	3475
CX3-T103-A14	50	0.3870	0.4938	0.204	0.376	197	206	52.7	4055
CX3-T103-A15	70	0.2680	0.3423	0.234	0.354	241	257	56.7	4875
CX3-T103-A16	95	0.1930	0.2469	0.253	0.340	286	309	59.9	5790
CX3-T103-A17	120	0.1530	0.1961	0.275	0.330	325	356	63.4	6790
CX3-T103-A18	150	0.1240	0.1595	0.297	0.320	364	405	67.0	7865
CX3-T103-A19	185	0.0991	0.1282	0.324	0.308	410	463	70.9	9220
CX3-T103-A20	240	0.0754	0.0986	0.360	0.296	475	546	76.2	11225
CX3-T103-A30	300	0.0601	0.0799	0.402	0.288	535	626	83.7	14265
Three Cores, Aluminium Conductor Cables									
AX3-T103-A12	25	1.2000	1.5390	0.165	0.431	102	103	47.3	2610
AX3-T103-A13	35	0.8680	1.1130	0.183	0.408	122	124	49.7	2850
AX3-T103-A14	50	0.6410	0.8220	0.204	0.376	144	149	52.4	3160
AX3-T103-A15	70	0.4430	0.5683	0.234	0.354	176	184	56.1	3575
AX3-T103-A16	95	0.3200	0.4107	0.253	0.340	209	222	59.7	4040
AX3-T103-A17	120	0.2530	0.3250	0.275	0.329	238	255	63.2	4530
AX3-T103-A18	150	0.2060	0.2649	0.297	0.320	266	288	67.0	5180
AX3-T103-A19	185	0.1640	0.2114	0.324	0.308	301	331	70.9	5800
AX3-T103-A20	240	0.1250	0.1618	0.360	0.295	349	389	76.0	6755
AX3-T103-A30	300	0.1000	0.1302	0.402	0.288	394	444	83.0	8500

The above data is approximate and subjected to manufacturing tolerance.

8.7/15 (17.5) kV

Three Cores Copper or Aluminium XLPE Insulated, Steel Wire Armoured and PVC Sheathed

Description

- Stranded circular compacted Copper or Aluminium conductor, semiconducting layer as conductor screen, XLPE insulated, semiconducting layer as non metallic insulation screen, Copper tape or wire as metallic insulation screen, three cores assembled together with non hygroscopic Polypropylene fillers, wrapped with binder tape, covered with a layer of PVC compound as a bedding, steel wire armoured and PVC sheathed.
- Cables are produced according to IEC 60502 or BS 6622.

Application

- These cables are generally suitable for direct burial or for installation on trays or in ducts.

Product - Code	Nominal Cross Sectional Area	Max. Conductor Resistance		Operating Capacitance	Inductance	Current Rating		Approx. Overall Diameter	Approx. Weight
		DC at 20 °C	AC at 90 °C			Laid in Ground	Laid in Free Air		
	mm^2	Ω/km	Ω/km	µf/km	mh/km	A	A	mm	kg/km
Three Cores, Copper Conductor Cables									
CX3-T103-W12	25	0.7270	0.9271	0.165	0.431	133	136	50.5	4530
CX3-T103-W13	35	0.5240	0.6684	0.183	0.408	158	164	52.9	5010
CX3-T103-W14	50	0.3870	0.4938	0.204	0.376	187	195	55.9	5715
CX3-T103-W15	70	0.2680	0.3423	0.234	0.354	227	241	59.9	6650
CX3-T103-W16	95	0.1930	0.2469	0.253	0.340	269	289	63.1	7655
CX3-T103-W17	120	0.1530	0.1961	0.275	0.330	305	331	66.6	8765
CX3-T103-W18	150	0.1240	0.1595	0.297	0.320	340	372	72.3	10935
CX3-T103-W19	185	0.0991	0.1282	0.324	0.308	381	423	76.2	12450
CX3-T103-W20	240	0.0754	0.0986	0.360	0.296	436	494	81.5	14735
CX3-T103-W30	300	0.0601	0.0799	0.402	0.288	485	556	87.6	17230
Three Cores, Aluminium Conductor Cables									
AX3-T103-W12	25	1.2000	1.5390	0.165	0.431	103	106	50.5	4030
AX3-T103-W13	35	0.8680	1.1130	0.183	0.408	123	127	52.9	4325
AX3-T103-W14	50	0.6410	0.8220	0.204	0.376	145	152	55.6	4715
AX3-T103-W15	70	0.4430	0.5683	0.234	0.354	177	188	59.3	5245
AX3-T103-W16	95	0.3200	0.4107	0.253	0.340	210	225	62.9	5825
AX3-T103-W17	120	0.2530	0.3250	0.275	0.329	238	259	66.4	6400
AX3-T103-W18	150	0.2060	0.2649	0.297	0.320	265	291	72.3	8095
AX3-T103-W19	185	0.1640	0.2114	0.324	0.308	300	332	76.2	8865
AX3-T103-W20	240	0.1250	0.1618	0.360	0.295	346	391	81.1	9850
AX3-T103-W30	300	0.1000	0.1302	0.402	0.288	387	442	86.9	11135

The above data is approximate and subjected to manufacturing tolerance.

12/20 (24) kV

Single & Three Cores Copper Conductors, XLPE Insulated and PVC Sheathed

Description

- Stranded circular compacted Copper conductor, semiconducting layer as conductor screen, XLPE insulated, semiconducting layer as non metallic insulation screen, Copper tape or wire as metallic insulation screen, three cores assembled together with non hygroscopic Polypropylene fillers, wrapped with binder tape and PVC sheathed.
- Cables are produced according to IEC 60502 or BS 6622.

Application

- These cables are generally suitable for direct burial or for installation on trays or in ducts.

Product - Code	Nominal Cross Sectional Area	Max. Conductor Resistance		Operating Capacitance	Inductance		Current Rating				Approx. Overall Diameter	Approx. Weight
							Laid in Ground		Laid in Free Air			
		DC at 20 °C	AC at 90 °C		Trefoil	Flat	Trefoil	Flat	Trefoil	Flat		
	mm^2	Ω/km	Ω/km	µf/km	mh/km	mh/km	A	A	A	A	mm	kg/km
Single Core Cable												
CX4-T101-U13	35	0.5240	0.6683	0.159	0.463	0.648	166	174	174	211	25.3	915
CX4-T101-U14	50	0.3870	0.4937	0.177	0.428	0.613	197	206	209	255	26.7	1070
CX4-T101-U15	70	0.2680	0.3420	0.202	0.403	0.588	242	252	262	319	28.7	1320
CX4-T101-U16	95	0.1930	0.2465	0.217	0.389	0.573	287	299	317	384	29.9	1575
CX4-T101-U17	120	0.1530	0.1956	0.236	0.376	0.561	326	339	366	443	31.5	1860
CX4-T101-U18	150	0.1240	0.1588	0.254	0.365	0.550	364	375	416	498	33.1	2220
CX4-T101-U19	185	0.0991	0.1272	0.276	0.350	0.535	411	422	478	570	35.0	2625
CX4-T101-U20	240	0.0754	0.0973	0.305	0.335	0.520	475	484	565	669	37.4	3185
CX4-T101-U30	300	0.0601	0.0781	0.340	0.325	0.510	535	542	650	765	40.2	3845
CX4-T101-U40	400	0.0470	0.0618	0.373	0.313	0.498	599	591	745	853	43.0	4780
CX4-T101-U50	500	0.0366	0.0490	0.417	0.302	0.487	674	659	859	975	46.6	5930
CX4-T101-U60	630	0.0283	0.0391	0.460	0.293	0.478	752	728	981	1103	50.3	7265
CX4-T101-U70	800	0.0221	0.0319	0.516	0.285	0.470	869	979	1160	1480	55.4	9200
CX4-T101-U80	1000	0.0176	0.0234	0.633	0.281	0.466	1084	1188	1515	1864	65.8	11570
Three Core Cables												
CX4-T103-U13	35	0.5240	0.6684	0.159	0.427	-	167	-	171	-	49.5	2745
CX4-T103-U14	50	0.3870	0.4938	0.177	0.394	-	197	-	206	-	52.8	3255
CX4-T103-U15	70	0.2680	0.3423	0.202	0.370	-	241	-	257	-	56.9	4035
CX4-T103-U16	95	0.1930	0.2469	0.217	0.357	-	286	-	309	-	59.7	4865
CX4-T103-U17	120	0.1530	0.1961	0.236	0.345	-	325	-	356	-	63.1	5800
CX4-T103-U18	150	0.1240	0.1595	0.254	0.336	-	364	-	405	-	66.7	6835
CX4-T103-U19	185	0.0991	0.1282	0.276	0.321	-	410	-	463	-	70.2	8110
CX4-T103-U20	240	0.0754	0.0986	0.305	0.308	-	475	-	546	-	75.6	9960
CX4-T103-U30	300	0.0601	0.0799	0.340	0.299	-	535	-	626	-	81.6	12085

This data is applicable for 12.7/22kV cables.
The ampacity for single core sizes 800 & 1000mm2 was based on a single end bonding.
The above data is approximate and subjected to manufacturing tolerance.

12/20 (24) kV

Single & Three Cores Aluminium Conductors, XLPE Insulated and PVC Sheathed

Description

- Stranded circular compacted Aluminium conductor, semiconducting layer as conductor screen, XLPE insulated, semiconducting layer as non metallic insulation screen, Copper tape or wire as metallic insulation screen, three cores assembled together with non hygroscopic Polypropylene fillers, wrapped with binder tape and PVC sheathed.
- Cables are produced according to IEC 60502 or BS 6622.

Application

- These cables are generally suitable for direct burial or for installation on trays or in ducts.

Product - Code	Nominal Cross Sectional Area	Max. Conductor Resistance		Operating Capacitance	Inductance		Current Rating				Approx. Overall Diameter	Approx. Weight
							Laid in Ground		Laid in Free Air			
		DC at 20 °C	AC at 90 °C		Trefoil	Flat	Trefoil	Flat	Trefoil	Flat		
	mm^2	Ω/km	Ω/km	μf/km	mh/km	mh/km	A	A	A	A	mm	kg/km
Single Core Cable												
AX4-T101-U13	35	0.8680	1.1130	0.159	0.463	0.648	129	135	135	164	25.3	705
AX4-T101-U14	50	0.6410	0.8220	0.177	0.428	0.613	153	160	162	198	26.6	775
AX4-T101-U15	70	0.4430	0.5681	0.202	0.403	0.588	188	196	204	248	28.4	890
AX4-T101-U16	95	0.3200	0.4105	0.217	0.389	0.573	222	233	246	299	29.9	1000
AX4-T101-U17	120	0.2530	0.3247	0.236	0.376	0.561	254	265	284	346	31.5	1125
AX4-T101-U18	150	0.2060	0.2645	0.254	0.365	0.550	283	295	324	391	33.1	1320
AX4-T101-U19	185	0.1640	0.2107	0.276	0.350	0.535	321	333	373	449	35.0	1475
AX4-T101-U20	240	0.1250	0.1610	0.305	0.335	0.520	372	385	443	530	37.3	1700
AX4-T101-U30	300	0.1000	0.1291	0.340	0.325	0.510	421	433	511	608	39.9	1945
AX4-T101-U40	400	0.0778	0.1009	0.373	0.313	0.498	478	483	593	693	43.0	2390
AX4-T101-U50	500	0.0605	0.0791	0.417	0.302	0.487	544	545	693	802	46.6	2800
AX4-T101-U60	630	0.0469	0.0621	0.460	0.293	0.478	617	612	803	921	50.2	3325
AX4-T101-U70	800	0.0367	0.0495	0.516	0.285	0.470	715	786	954	1188	55.4	4060
AX4-T101-U80	1000	0.0291	0.0376	0.633	0.281	0.466	862	937	1205	1468	65.8	5220
Three Core Cables												
AX4-T103-U13	35	0.8680	1.1130	0.159	0.427	-	129	-	133	-	48.9	2050
AX4-T103-U14	50	0.6410	0.8220	0.177	0.394	-	153	-	160	-	52.0	2295
AX4-T103-U15	70	0.4430	0.5683	0.202	0.370	-	187	-	200	-	55.6	2650
AX4-T103-U16	95	0.3200	0.4107	0.217	0.357	-	222	-	240	-	59.1	3060
AX4-T103-U17	120	0.2530	0.3250	0.236	0.345	-	253	-	277	-	62.3	3470
AX4-T103-U18	150	0.2060	0.2649	0.254	0.336	-	283	-	314	-	65.9	4025
AX4-T103-U19	185	0.1640	0.2114	0.276	0.321	-	320	-	361	-	70.0	4605
AX4-T103-U20	240	0.1250	0.1618	0.305	0.308	-	371	-	427	-	75.2	5420
AX4-T103-U30	300	0.1000	0.1302	0.340	0.299	-	420	-	491	-	80.3	6175

This data is applicable for 12.7/22kV cables.
The ampacity for single core sizes 800 & 1000mm2 was based on a single end bonding.
The above data is approximate and subjected to manufacturing tolerance.

Three Cores Copper or Aluminium Conductors, XLPE Insulated, Steel Tape Armoured and PVC Sheathed

Description

- Stranded circular compacted Copper or Aluminium conductor, semiconducting layer as conductor screen, XLPE insulated, semiconducting layer as non metallic insulation screen, Copper tape or wire as metallic insulation screen, three cores assembled together with non hygroscopic Polypropylene fillers, wrapped with binder tape, covered with a layer of PVC compound as a bedding, steel tape armoured and PVC sheathed.
- Cables are produced according to IEC 60502.

Application

- These cables are generally suitable for direct burial or for installation on trays or in ducts.

Product - Code	Nominal Cross Sectional Area	Max. Conductor Resistance		Operating Capacitance	Inductance	Current Rating		Approx. Overall Diameter	Approx. Weight
		DC at 20 °C	AC at 90 °C			Laid in Ground	Laid in Free Air		
	mm^2	Ω/km	Ω/km	µf/km	mh/km	A	A	mm	kg/km
Three Cores, Copper Conductor Cables									
CX4-T103-A13	35	0.5240	0.6684	0.159	0.427	167	171	54.1	3875
CX4-T103-A14	50	0.3870	0.4938	0.177	0.394	197	206	57.6	4490
CX4-T103-A15	70	0.2680	0.3423	0.202	0.370	241	257	61.6	5360
CX4-T103-A16	95	0.1930	0.2469	0.217	0.357	286	309	64.7	6290
CX4-T103-A17	120	0.1530	0.1961	0.236	0.345	325	356	67.9	7265
CX4-T103-A18	150	0.1240	0.1595	0.254	0.336	364	405	71.5	8380
CX4-T103-A19	185	0.0991	0.1282	0.276	0.321	410	463	75.4	9810
CX4-T103-A20	240	0.0754	0.0986	0.305	0.308	475	546	82.4	12590
CX4-T103-A30	300	0.0601	0.0799	0.340	0.299	535	626	88.4	14920
Three Cores, Aluminium Conductor Cables									
AX4-T103-A13	35	0.8680	1.1130	0.159	0.427	122	124	54.1	3250
AX4-T103-A14	50	0.6410	0.8220	0.177	0.394	144	149	57.2	3570
AX4-T103-A15	70	0.4430	0.5683	0.202	0.370	176	184	60.8	4010
AX4-T103-A16	95	0.3200	0.4107	0.217	0.357	209	222	64.5	4535
AX4-T103-A17	120	0.2530	0.3250	0.236	0.345	238	255	68.1	5085
AX4-T103-A18	150	0.2060	0.2649	0.254	0.336	266	288	71.7	5730
AX4-T103-A19	185	0.1640	0.2114	0.276	0.321	301	331	75.4	6390
AX4-T103-A20	240	0.1250	0.1618	0.305	0.308	349	389	82.1	8110
AX4-T103-A30	300	0.1000	0.1302	0.340	0.299	394	444	87.9	9180

This data is applicable for 12.7/22kV cables.
The above data is approximate and subjected to manufacturing tolerance.

Three Cores Copper or Aluminium Conductors, XLPE Insulated, Steel Wire Armoured and PVC Sheathed

Description

- Stranded circular compacted Copper or Aluminium conductor, semiconducting layer as conductor screen, XLPE insulated, semiconducting layer as non metallic insulation screen, Copper tape or wire as metallic insulation screen, three cores assembled together with non hygroscopic Polypropylene fillers, wrapped with binder tape, covered with a layer of PVC compound as a bedding, steel wire armoured and PVC sheathed.
- Cables are produced according to IEC 60502 or BS 6622.

Application

- These cables are generally suitable for direct burial or for installation on trays or in ducts.

Product - Code	Nominal Cross Sectional Area	Max. Conductor Resistance		Operating Capacitance	Inductance	Current Rating		Approx. Overall Diameter	Approx. Weight
		DC at 20 °C	AC at 90 °C			Laid in Ground	Laid in Free Air		
	mm^2	Ω/km	Ω/km	μf/km	mh/km	A	A	mm	kg/km
Three Cores, Copper Conductor Cables									
CX4-T103-W13	35	0.5240	0.6684	0.159	0.427	158	164	57.3	5560
CX4-T103-W14	50	0.3870	0.4938	0.177	0.394	187	195	60.8	6295
CX4-T103-W15	70	0.2680	0.3423	0.202	0.370	227	241	64.9	7280
CX4-T103-W16	95	0.1930	0.2469	0.217	0.357	269	289	67.9	8300
CX4-T103-W17	120	0.1530	0.1961	0.236	0.345	305	331	73.2	10350
CX4-T103-W18	150	0.1240	0.1595	0.254	0.336	340	372	76.8	11670
CX4-T103-W19	185	0.0991	0.1282	0.276	0.321	381	423	80.5	13225
CX4-T103-W20	240	0.0754	0.0986	0.305	0.308	436	494	86.3	15515
CX4-T103-W30	300	0.0601	0.0799	0.340	0.299	485	556	92.5	18095
Three Cores, Aluminium Conductor Cables									
AX4-T103-W13	35	0.8680	1.1130	0.159	0.427	123	127	57.3	4870
AX4-T103-W14	50	0.6410	0.8220	0.177	0.394	145	152	60.4	5270
AX4-T103-W15	70	0.4430	0.5683	0.202	0.370	177	188	64.0	5820
AX4-T103-W16	95	0.3200	0.4107	0.217	0.357	210	225	67.7	6460
AX4-T103-W17	120	0.2530	0.3250	0.236	0.345	238	259	73.2	8045
AX4-T103-W18	150	0.2060	0.2649	0.254	0.336	265	291	76.8	8815
AX4-T103-W19	185	0.1640	0.2114	0.276	0.321	300	332	81.1	9675
AX4-T103-W20	240	0.1250	0.1618	0.305	0.308	346	391	86.0	10775
AX4-T103-W30	300	0.1000	0.1302	0.340	0.299	387	442	91.8	12050

This data is applicable for 12.7/22kV cables.
The above data is approximate and subjected to manufacturing tolerance.

18/30 (36) kV

Single & Three Cores Copper Conductors, XLPE Insulated and PVC Sheathed

Description

- Stranded circular compacted Copper conductor, semiconducting layer as conductor screen, XLPE insulated, semiconducting layer as non metallic insulation screen, Copper tape or wire as metallic insulation screen, three cores assembled together with non hygroscopic Polypropylene fillers, wrapped with binder tape and PVC sheathed.
- Cables are produced according to IEC 60502 or BS 6622.

Application

- These cables are generally suitable for direct burial or for installation on trays or in ducts.

Product - Code	Nominal Cross Sectional Area	Max. Conductor Resistance		Operating Capacitance	Inductance		Current Rating				Approx. Overall Diameter	Approx. Weight
					Trefoil	Flat	Laid in Ground		Laid in Free Air			
		DC at 20 °C	AC at 90 °C				Trefoil	Flat	Trefoil	Flat		
	mm²	Ω/km	Ω/km	µf/km	mh/km	mh/km	A	A	A	A	mm	kg/km
Single Core Cable												
CX5-T101-U14	50	0.3870	0.4937	0.138	0.465	0.649	197	206	209	255	32.1	1325
CX5-T101-U15	70	0.2680	0.3420	0.156	0.436	0.621	242	252	262	319	33.9	1575
CX5-T101-U16	95	0.1930	0.2465	0.167	0.422	0.607	287	299	317	384	35.3	1855
CX5-T101-U17	120	0.1530	0.1956	0.180	0.406	0.591	326	339	366	443	36.7	2140
CX5-T101-U18	150	0.1240	0.1588	0.192	0.395	0.580	364	375	416	498	38.5	2525
CX5-T101-U19	185	0.0991	0.1272	0.208	0.378	0.563	411	422	478	570	40.2	2930
CX5-T101-U20	240	0.0754	0.0973	0.228	0.362	0.547	475	484	565	669	42.8	3540
CX5-T101-U30	300	0.0601	0.0781	0.252	0.350	0.535	535	542	650	765	45.6	4225
CX5-T101-U40	400	0.0470	0.0618	0.275	0.337	0.522	599	591	745	853	48.4	5165
CX5-T101-U50	500	0.0366	0.0490	0.306	0.324	0.509	674	659	859	975	52.0	6350
CX5-T101-U60	630	0.0283	0.0391	0.336	0.313	0.498	752	728	981	1103	55.7	7715
CX5-T101-U70	800	0.0221	0.0319	0.374	0.303	0.488	869	979	1160	1480	60.6	9660
CX5-T101-U80	1000	0.0176	0.0234	0.455	0.297	0.481	1084	1188	1515	1864	71.2	12135
Three Core Cables												
CX5-T103-U14	50	0.3870	0.4938	0.138	0.436	-	197	-	206	-	63.0	3990
CX5-T103-U15	70	0.2680	0.3423	0.156	0.410	-	241	-	257	-	67.1	4835
CX5-T103-U16	95	0.1930	0.2469	0.167	0.395	-	286	-	309	-	69.9	5705
CX5-T103-U17	120	0.1530	0.1961	0.180	0.381	-	325	-	356	-	73.1	6645
CX5-T103-U18	150	0.1240	0.1595	0.192	0.368	-	364	-	405	-	76.3	7645
CX5-T103-U19	185	0.0991	0.1282	0.208	0.353	-	410	-	463	-	82.2	9385
CX5-T103-U20	240	0.0754	0.0986	0.228	0.338	-	475	-	546	-	85.8	10865
CX5-T103-U30	300	0.0601	0.0799	0.252	0.327	-	535	-	626	-	91.8	13115

This data is applicable for 19/33 kV cables
The ampacity for single core sizes 800 & 1000mm2 was based on a single end bonding.
The above data is approximate and subjected to manufacturing tolerance.

18/30 (36) kV

Single & Three Cores Aluminium Conductors,
XLPE Insulated and PVC Sheathed

Description

- Stranded circular compacted Aluminium conductor, semiconducting layer as conductor screen, XLPE insulated, semiconducting layer as non metallic insulation screen, Copper tape or wire as metallic insulation screen, three cores assembled together with non hygroscopic Polypropylene fillers, wrapped with binder tape and PVC sheathed.
- Cables are produced according to IEC 60502 or BS 6622.

Application

- These cables are generally suitable for direct burial or for installation on trays or in ducts.

Product - Code	Nominal Cross Sectional Area	Max. Conductor Resistance		Operating Capacitance	Inductance		Current Rating				Approx. Overall Diameter	Approx. Weight
		DC at 20 °C	AC at 90 °C		Trefoil	Flat	Laid in Ground		Laid in Free Air			
							Trefoil	Flat	Trefoil	Flat		
	mm^2	Ω/km	Ω/km	μf/km	mh/km	mh/km	A	A	A	A	mm	kg/km
Single Core Cable												
AX5-T101-U14	50	0.6410	0.8220	0.138	0.465	0.649	153	160	162	198	32.0	1025
AX5-T101-U15	70	0.4430	0.5681	0.156	0.436	0.621	188	196	204	248	33.6	1140
AX5-T101-U16	95	0.3200	0.4105	0.167	0.422	0.607	222	233	246	299	35.3	1270
AX5-T101-U17	120	0.2530	0.3247	0.180	0.406	0.591	254	265	284	346	36.7	1400
AX5-T101-U18	150	0.2060	0.2645	0.192	0.395	0.580	283	295	324	391	38.5	1630
AX5-T101-U19	185	0.1640	0.2107	0.208	0.378	0.563	321	333	373	449	40.2	1790
AX5-T101-U20	240	0.1250	0.1610	0.228	0.362	0.547	372	385	443	530	42.7	2050
AX5-T101-U30	300	0.1000	0.1291	0.252	0.350	0.535	421	433	511	608	45.3	2320
AX5-T101-U40	400	0.0778	0.1009	0.275	0.337	0.522	478	483	593	693	48.4	2775
AX5-T101-U50	500	0.0605	0.0791	0.306	0.324	0.509	544	545	693	802	52.0	3215
AX5-T101-U60	630	0.0469	0.0621	0.336	0.313	0.498	617	612	803	921	55.6	3765
AX5-T101-U70	800	0.0367	0.0495	0.374	0.303	0.488	715	786	954	1188	60.6	4515
AX5-T101-U80	1000	0.0291	0.0376	0.455	0.297	0.481	862	937	1205	1468	71.2	5790
Three Core Cables												
AX5-T103-U14	50	0.6410	0.8220	0.138	0.436	-	153	-	160	-	62.8	3095
AX5-T103-U15	70	0.4430	0.5683	0.156	0.410	-	187	-	200	-	66.4	3525
AX5-T103-U16	95	0.3200	0.4107	0.167	0.395	-	222	-	240	-	69.9	3985
AX5-T103-U17	120	0.2530	0.3250	0.180	0.381	-	253	-	277	-	73.1	4435
AX5-T103-U18	150	0.2060	0.2649	0.192	0.368	-	283	-	314	-	76.3	4960
AX5-T103-U19	185	0.1640	0.2114	0.208	0.353	-	320	-	361	-	80.4	5555
AX5-T103-U20	240	0.1250	0.1618	0.228	0.338	-	371	-	427	-	85.5	6390
AX5-T103-U30	300	0.1000	0.1302	0.252	0.327	-	420	-	491	-	91.1	7350

This data is applicable for 19/33 kV cables
The ampacity for single core sizes 800 & 1000mm2 was based on a single end bonding.
The above data is approximate and subjected to manufacturing tolerance.

18/30 (36) kV

Three Cores Copper or Aluminium Conductors, XLPE Insulated, Steel Tape Armoured and PVC Sheathed

Description

- Stranded circular compacted Copper or Aluminium conductor, semiconducting layer as conductor screen, XLPE insulated, semiconducting layer as non metallic insulation screen, Copper tape or wire as metallic insulation screen, three cores assembled together with non hygroscopic Polypropylene fillers, wrapped with binder tape, covered with a layer of PVC compound as a bedding, steel Tape armoured and PVC sheathed.
- Cables are produced according to IEC 60502.

Application

- These cables are generally suitable for direct burial or for installation on trays or in ducts.

Product - Code	Nominal Cross Sectional Area	Max. Conductor Resistance		Operating Capacitance	Inductance	Current Rating		Approx. Overall Diameter	Approx. Weight
		DC at 20 °C	AC at 90 °C			Laid in Ground	Laid in Free Air		
	mm^2	Ω/km	Ω/km	µf/km	mh/km	A	A	mm	kg/km
Three Cores, Copper Conductor Cables									
CX5-T103-A14	50	0.3870	0.4938	0.138	0.436	185	192	69.4	5730
CX5-T103-A15	70	0.2680	0.3423	0.156	0.410	226	237	73.7	6725
CX5-T103-A16	95	0.1930	0.2469	0.167	0.395	269	286	76.7	7705
CX5-T103-A17	120	0.1530	0.1961	0.180	0.381	306	328	81.3	9720
CX5-T103-A18	150	0.1240	0.1595	0.192	0.368	342	371	84.7	10680
CX5-T103-A19	185	0.0991	0.1282	0.208	0.353	386	424	88.6	12120
CX5-T103-A20	240	0.0754	0.0986	0.229	0.338	446	497	94.4	14310
CX5-T103-A30	300	0.0601	0.0799	0.252	0.327	502	566	100.4	16790
Three Cores, Aluminium Conductor Cables									
AX5-T103-A14	50	0.6410	0.8220	0.138	0.436	144	149	69.2	4830
AX5-T103-A15	70	0.4430	0.5683	0.156	0.410	176	184	73.0	5395
AX5-T103-A16	95	0.3200	0.4107	0.167	0.395	209	222	76.7	5980
AX5-T103-A17	120	0.2530	0.3250	0.180	0.381	238	255	81.3	7310
AX5-T103-A18	150	0.2060	0.2649	0.192	0.368	266	288	84.7	7995
AX5-T103-A19	185	0.1640	0.2114	0.208	0.353	301	331	88.6	8700
AX5-T103-A20	240	0.1250	0.1618	0.228	0.338	349	389	94.1	9820
AX5-T103-A30	300	0.1000	0.1302	0.252	0.327	394	444	99.7	11000

This data is applicable for 19/33 kV cables
The above data is approximate and subjected to manufacturing tolerance.

18/30 (36) kV

Three Cores Copper or Aluminium Conductors, XLPE Insulated, Steel Wire Armoured and PVC Sheathed

Description

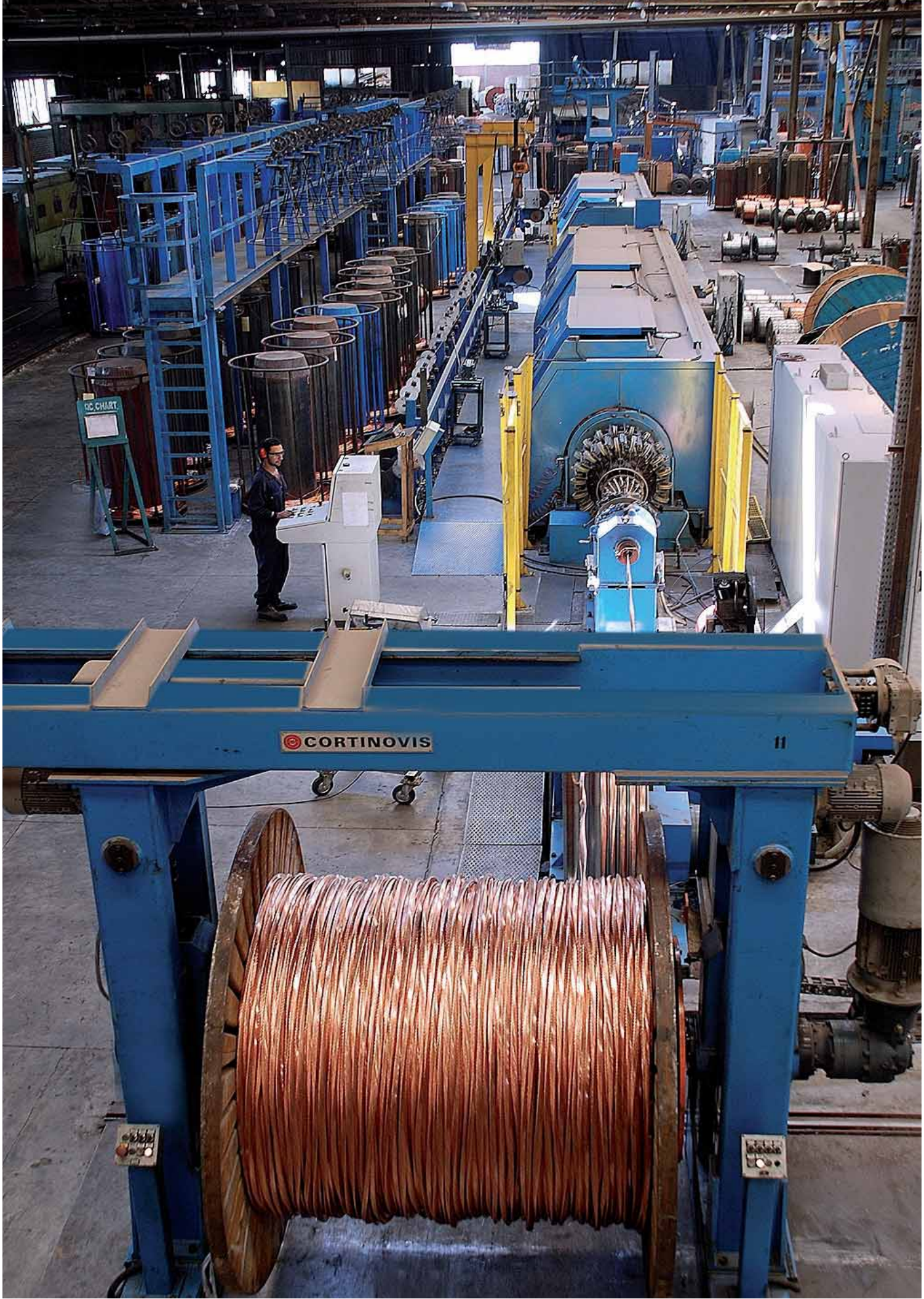
- Stranded circular compacted Copper or Aluminium conductor, semiconducting layer as conductor screen, XLPE insulated, semiconducting layer as non metallic insulation screen, Copper tape or wire as metallic insulation screen, three cores assembled together with non hygroscopic Polypropylene fillers, wrapped with binder tape, covered with a layer of PVC compound as a bedding, steel wire armoured and PVC sheathed.
- Cables are produced according to IEC 60502 or BS 6622.

Application

- These cables are generally suitable for direct burial or for installation on trays or in ducts.

Product - Code	Nominal Cross Sectional Area	Max. Conductor Resistance		Operating Capacitance	Inductance	Current Rating		Approx. Overall Diameter	Approx. Weight
		DC at 20 °C	AC at 90 °C			Laid in Ground	Laid in Free Air		
	mm^2	Ω/km	Ω/km	µf/km	mh/km	A	A	mm	kg/km
Three Cores, Copper Conductor Cables									
CX5-T103-W14	50	0.3870	0.4938	0.138	0.436	187	195	74.7	8910
CX5-T103-W15	70	0.2680	0.3423	0.156	0.410	227	241	78.8	10025
CX5-T103-W16	95	0.1930	0.2469	0.167	0.395	269	289	81.8	11175
CX5-T103-W17	120	0.1530	0.1961	0.180	0.381	305	331	85.2	12500
CX5-T103-W18	150	0.1240	0.1595	0.192	0.368	340	372	88.4	13595
CX5-T103-W19	185	0.0991	0.1282	0.208	0.353	381	423	92.5	15255
CX5-T103-W20	240	0.0754	0.0986	0.228	0.338	436	494	98.3	17665
CX5-T103-W30	300	0.0601	0.0799	0.252	0.327	485	556	104.5	20405
Three Cores, Aluminium Conductor Cables									
AX5-T103-W14	50	0.6410	0.8220	0.138	0.436	145	152	74.3	7810
AX5-T103-W15	70	0.4430	0.5683	0.156	0.410	177	188	78.3	8560
AX5-T103-W16	95	0.3200	0.4107	0.167	0.395	210	225	81.8	9265
AX5-T103-W17	120	0.2530	0.3250	0.180	0.381	238	259	85.2	9995
AX5-T103-W18	150	0.2060	0.2649	0.192	0.368	265	291	88.6	10800
AX5-T103-W19	185	0.1640	0.2114	0.208	0.353	300	332	92.5	11615
AX5-T103-W20	240	0.1250	0.1618	0.228	0.338	346	391	98.0	12880
AX5-T103-W30	300	0.1000	0.1302	0.252	0.327	387	442	103.8	14300

This data is applicable for 19/33 kV cables
The above data is approximate and subjected to manufacturing tolerance.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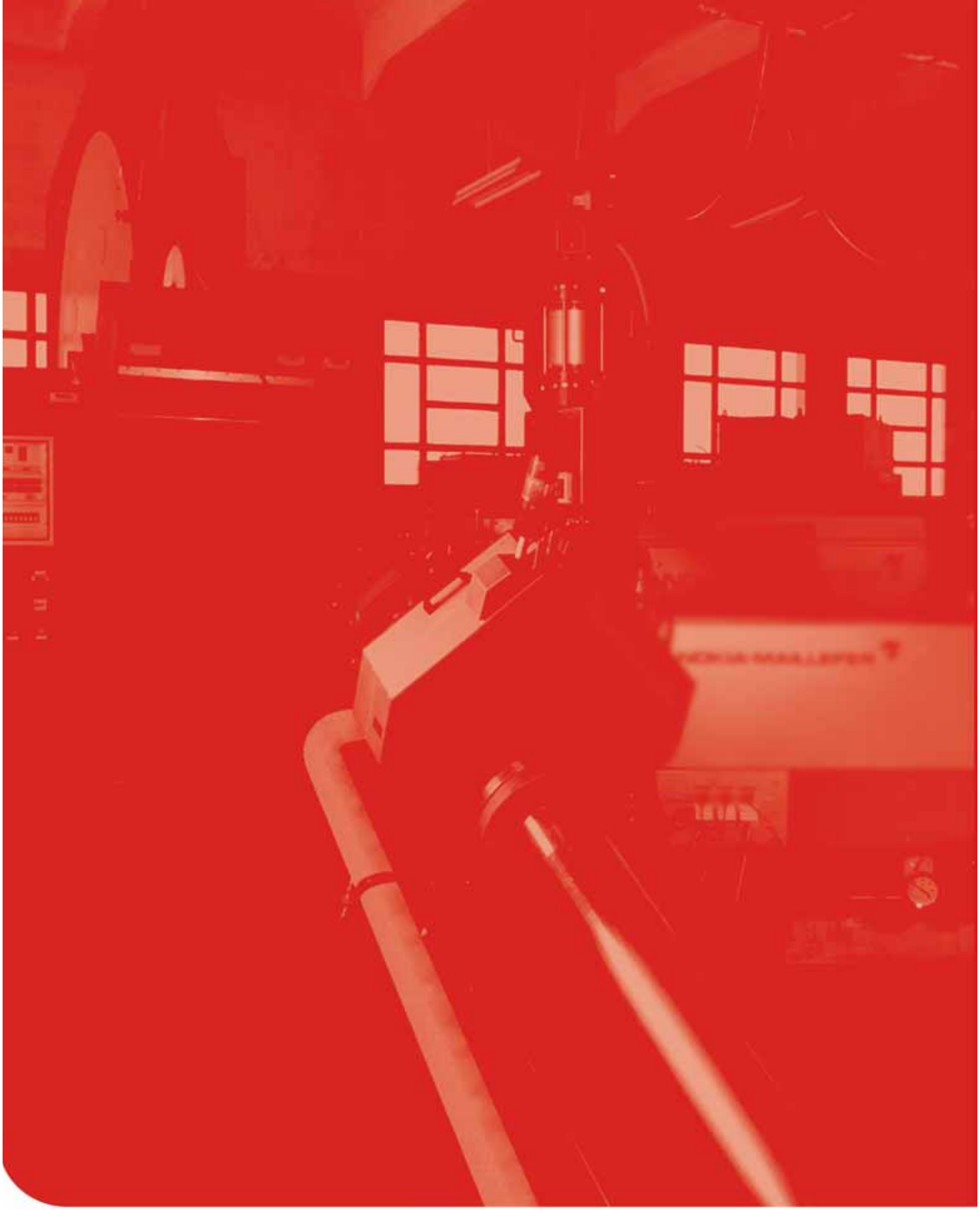


Cable Construction

1. Conductor

Conductor consists of stranded Aluminum or soft drawn copper conductor are produced by two technologies:

a. Circular Compacted

One or multi layers of stranded wires are assembled together to form a circular compacted conductor

b. Segmental Conductor

Five segments of compacted conductor in triangle shape of 72 degree are assembled together with separation of non metallic tapes to reduce the skin effect which reduce the AC conductor resistance. Segmental conductors are applied for conductor cross sectional area of 1000 mm2 and above

Water blocking:

Swelling powder or water blocking tapes should be applied between the conductor strands to block the ingress of water inside the cable conductor (if required).

2. Conductor Screen

An extruded layer of cross linkable semi conducting to reduce and control the electric stress beneath the insulation layer of cross linked polyethylene (XLPE). The semi conducting layer shall be firmly bonded to the inner layer of the insulation layer.

3. Cross Linked Polyethylene Insulation

An extruded layer of cross linked polyethylene (XLPE) of high grad is extruded in dry cooling and curing continuous vulcanizing line. The thickness of insulation should be calculated as per the operating voltage, impulse voltage and expected cable life time which should be verified by carrying out type tests as per the applicable standards.

4. Insulation Screen

An extruded layer of cross linkable semi conducting is applied over the insulation layer to insure that the electric stress is homogenous around the insulated core. The semi conducting layer shall be firmly bonded to the outer layer of the insulation layer.

Conductor screen, insulation and insulation screen are applied simultaneously in one process (triple extrusion process) to insure that all extruded layers are firmly bonded together.

5. Metallic Screen / Sheath

One or multi layers of metallic screen / sheath such as copper wires, lead, aluminum, etc. shall be applied as a return path of earth fault current. Metallic sheaths may be used for water blocking protection and mechanical protection.

6. Overall Jacket (Outer Sheath)

An extruded layer of PVC, PE (HDPE, LDPE, MDPE) shall be applied over the metallic layers for protection against chemical reaction, mechanical and electrical protection. Extruded semi conductive layer or graphite coating shall be applied over the outer sheath for testing purpose.

HIGH
VOLT

System Designation for High & Extra High Voltage Cable

You can order our product by giving the following information:

1. Cable code as per the catalogue.
2. If your required cable/conductor is out of our catalogue range, you can use the following codes to determine your cable.

o o o — o o o o — o o o

Conductor

- C Copper
- A Aluminium
- D Copper + Swelling powder
- G Copper + Swelling tape
- H Aluminium + Swelling powder
- F Aluminium + Swelling tape

Insulation

- X XLPE

Voltage

- 6 38/66 kV (72.5) kV
- 7 76/132 kV (145) kV
- 8 127/220 kV (245) kV

Conductor Type

- T Stranded

Sheathing

- X HDPE
- Z PVC+Anti Termite
- L LSHF
- T MDPE
- S PVC+Flame Retardant +Low Smoke
- B PVC+Flame Retardant +Anti Termite
- P LLDPE

No. of Cores

- 01 Single Core

Code	mm²	Code	mm²
18	150	70	800
19	185	80	1000
20	240	81	1200
30	300	83	1600
40	400	84	2000
50	500	85	2500
60	630		

Screening/ Metal Sheath

- L Lead
- N Lead Alloy
- X Aluminium Wire
- T Lead+Aluminium Wire
- K Copper Wires + AL Copolymer
- 5 Copper Wires + Lead

Single Core Copper Conductor, XLPE insulated, Copper Wire Screen and HDPE Sheathed

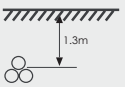
Stranded circular or segmantal compacted copper conductor, semi-conducting layer as conductor screen, XLPE insulated, semi-conducting layer as non metallic insulation screen, Semi-conductive water blocking tape, copper wire as metallic insulation screen to withstand the required earth fault current, non-conductive water blocking tape to protect the screen area from longitudinal water penetration, copolymer aluminum tape to protect the cable from radial water penetration and HDPE sheathed with graphite coating or extruded semi-conducting layer. Cables are designed and tested to comply with IEC 60228, 60840 and 60811.

Constructional Data

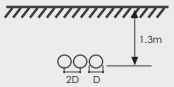
Product - Code	Condutor		Thickness of Conductor Screen	Thickness of Insulation	Thickness of Insulation Screen	No. of Wires x Wire Dia	Thickness of Outer Sheath	Approx. Outer Diameter of Cable	Approx. Weight of Cable	Max. DC Conductor Resistance at 20°C	Capacitance
	Cross-Sectional Area	Shape									
	mm^2		mm	mm	mm	mm	mm	mm	(kg/km)	(Ω/km)	(μf/km)
CX6-TX01-K18	150		1.0	10	1.0	50 x 1.43	3.5	50.8	3650	0.1240	0.173
CX6-TX01-K19	185		1.0	10	1.0	50 x 1.43	3.5	52.7	4075	0.0991	0.186
CX6-TX01-K20	240		1.0	10	1.0	50 x 1.43	3.5	55.1	4700	0.0754	0.203
CX6-TX01-K30	300	Compact	1.0	10	1.0	50 x 1.43	3.5	57.5	5400	0.0601	0.221
CX6-TX01-K40	400	Round (R)	1.0	10	1.0	50 x 1.43	3.5	60.1	6260	0.0470	0.239
CX6-TX01-K50	500	Stranded	1.0	10	1.0	50 x 1.43	4.0	64.5	7570	0.0366	0.263
CX6-TX01-K60	630		1.0	10	1.0	50 x 1.43	4.0	68.0	8910	0.0283	0.288
CX6-TX01-K70	800		1.0	10	1.0	50 x 1.43	4.0	72.3	10895	0.0221	0.319
CX6-TX01-K80	1000	Segmental	1.5	10	1.2	50 x 1.43	4.0	81.6	13280	0.0176	0.380
CX6-TX01-K81	1200	Stranded(S)	1.5	10	1.2	50 x 1.43	4.5	84.5	15300	0.0151	0.395
CX6-TX01-K83	1600	(Milliken)	1.5	10	1.2	50 x 1.43	4.5	92.9	19670	0.0113	0.453

Continous Current Ratings Load Factor = 100% for one circuit in operation (Amperes)

Laying conditions: trefoil formation

Type of Earthing Bonding System	Cross Sectional Area	Direct burial		In air (shaded)	
					
	mm^2	ρ_T=120 T = 25 °C	ρ_T=150 T = 35 °C	T = 30 °C	T = 40 °C
Bonded at both ends	150 R	357	300	485	438
	185 R	400	336	553	499
	240 R	459	385	648	584
	300 R	514	430	738	665
	400 R	577	482	845	761
	500 R	643	538	966	871
Cross or single point bonding	630 R	774	647	1168	1052
	800 R	863	720	1332	1199
	1000 S	1040	868	1658	1494
	1200 S	1119	933	1797	1618
	1600 S	1283	1068	2131	1919

Laying condition: flat formation

Type of Earthing Bonding System	Cross Sectional Area	Direct Burial		In air (shaded)	
					
	mm^2	ρ_T=120 T = 25 °C	ρ_T=150 T = 35 °C	T = 30 °C	T = 40 °C
Cross or single point bonding	150 R	378	318	557	504
	185 R	427	360	639	578
	240 R	496	417	756	684
	300 R	561	471	871	787
	400 R	639	536	1010	913
	500 R	729	611	1175	1061
	630 R	829	694	1363	1232
	800 R	935	782	1573	1421
	1000 S	1112	929	1926	1740
	1200 S	1200	1002	2095	1893
	1600 S	1394	1163	2517	2273

* R: Round Conductor
* S: Segmental Conductor

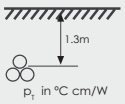
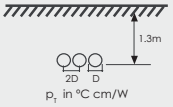
Single Core Copper Conductor, XLPE insulated, Lead Sheathed and HDPE Sheathed

Stranded circular or segmental compacted copper conductor, semi-conducting layer as conductor screen, XLPE insulated, semi-conducting layer as non metallic insulation screen,semi conductive water blocking tape to protect the screen area from longitudinal water penetration, lead sheathed with suitable thickness to withstand the required earth fault current and HDPE sheathed with graphite coating or extruded semi-conducting layer.
Cables are designed and tested to comply with IEC 60228, 60840 and 60811.

Constructional Data

Product - Code	Condutor		Thickness of Conductor Screen	Thickness of Insulation	Thickness of Insulation Screen	No. of Wires x Wire Dia	Thickness of Outer Sheath	Approx. Outer Diameter of Cable	Approx. Weight of Cable	Max. DC Conductor Resistance at 20°C	Capacitance
	Cross-Sectional Area	Shape									
	mm^2		mm	mm	mm	mm	mm	mm	(kg/km)	(Ω/km)	(μf/km)
CX6-TX01-N18	150	Compact Round (R) Stranded	1.0	10	1.0	2.0	3.5	50.3	5720	0.1240	0.173
CX6-TX01-N19	185		1.0	10	1.0	2.0	3.5	52.0	6260	0.0991	0.186
CX6-TX01-N20	240		1.0	10	1.0	2.1	3.5	54.6	7215	0.0754	0.203
CX6-TX01-N30	300		1.0	10	1.0	2.2	3.5	57.2	8265	0.0601	0.221
CX6-TX01-N40	400		1.0	10	1.0	2.3	3.5	60.0	9515	0.0470	0.239
CX6-TX01-N50	500		1.0	10	1.0	2.4	4.0	64.6	11295	0.0366	0.263
CX6-TX01-N60	630		1.0	10	1.0	2.4	4.0	68.1	13190	0.0283	0.288
CX6-TX01-N70	800		1.0	10	1.0	2.6	4.0	72.8	15725	0.0221	0.319
CX6-TX01-N80	1000	Segmental Stranded(S) (Milliken)	1.5	10	1.2	2.7	4.0	82.3	19220	0.0176	0.380
CX6-TX01-N81	1200		1.5	10	1.2	2.8	4.5	85.3	21690	0.0151	0.395
CX6-TX01-N83	1600		1.5	10	1.2	3.0	4.5	94.2	27485	0.0113	0.453

Continous Current Ratings Load Factor = 100% for one circuit in operation (Amperes)

Laying conditions: trefoil formation						Laying condition: flat formation					
Type of Earthing Bonding System	Cross Sectional Area	Direct burial 		In air (shaded)		Type of Earthing Bonding System	Cross Sectional Area	Direct Burial 		In air (shaded)	
	mm^2	p_1=120 T = 25 °C	p_1=150 T = 35 °C	T = 30 °C	T = 40 °C		mm^2	p_1=120 T = 25 °C	p_1=150 T = 35 °C	T = 30 °C	T = 40 °C
Bonded at both Ends	150 R	364	306	495	446	Cross or single point bonding	150 R	379	319	560	506
	185 R	410	344	565	510		185 R	428	360	642	581
	240 R	473	397	665	600		240 R	497	417	760	687
	300 R	532	445	761	686		300 R	562	472	875	791
	400 R	600	502	876	789		400 R	640	537	1016	918
	500 R	674	563	1007	908		500 R	730	611	1181	1067
Cross or single point bonding	630 R	770	644	1171	1055		630 R	829	694	1369	1237
	800 R	856	715	1334	1202		800 R	934	780	1580	1427
	1000 S	1022	852	1646	1483		1000 S	1105	923	1927	1741
	1200 S	1095	913	1778	1602		1200 S	1190	994	2088	1886
	1600 S	1239	1031	2087	1880		1600 S	1372	1144	2495	2254

* R: Round Conductor
* S: Segmental Conductor

Single Core Copper Conductor, XLPE insulated, Copper Wire Screen and HDPE Sheathed

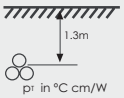
Stranded circular or segmantal compacted copper conductor, semi-conducting layer as conductor screen, XLPE insulated, semi-conducting layer as non metallic insulation screen, Semi-conductive water blocking tape, copper wire as metallic insulation screen to withstand the required earth fault current, non-conductive water blocking tape to protect the screen area from longitudinal water penetration, copolymer aluminum tape to protect the cable from radial water penetration and HDPE sheathed with graphite coating or extruded semi-conducting layer. Cables are designed and tested to comply with IEC 60228, 60840 and 60811.

Constructional Data

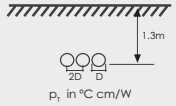
Product - Code	Condutor		Thickness of Conductor Screen	Thickness of Insulation	Thickness of Insulation Screen	No. of Wires x Wire Dia	Thickness of Outer Sheath	Approx. Outer Diameter of Cable	Approx. Weight of Cable	Max. DC Conductor Resistance at 20°C	Capacitance
	Cross-Sectional Area	Shape									
	mm²		mm	mm	mm	mm	mm	mm	(kg/km)	(Ω/km)	(µf/km)
CX7-TX01-K20	240	Compact Round (R) Stranded	1.2	16	1.0	75 x 1.75	4.5	70.1	6960	0.0754	0.149
CX7-TX01-K30	300		1.2	16	1.0	75 x 1.75	4.5	72.5	7700	0.0601	0.160
CX7-TX01-K40	400		1.2	16	1.0	75 x 1.75	4.5	75.1	8630	0.0470	0.172
CX7-TX01-K50	500		1.2	16	1.0	75 x 1.75	4.5	78.5	9915	0.0366	0.188
CX7-TX01-K60	630		1.2	16	1.0	75 x 1.75	4.5	82.0	11375	0.0283	0.204
CX7-TX01-K70	800		1.2	16	1.0	75 x 1.75	4.5	86.3	13395	0.0221	0.223
CX7-TX01-K80	1000	Segmental Stranded(S) (Milliken)	1.5	16	1.2	75 x 1.75	4.5	95.2	15920	0.0176	0.261
CX7-TX01-K81	1200		1.5	16	1.2	75 x 1.75	4.5	97.1	17840	0.0151	0.269
CX7-TX01-K83	1600		1.5	16	1.2	75 x 1.75	4.5	105.5	22370	0.0113	0.306
CX7-TX01-K84	2000		1.5	16	1.2	75 x 1.75	4.5	110.5	26440	0.0090	0.328
CX7-TX01-K85	2500		1.5	16	1.2	75 x 1.75	4.5	116.8	31365	0.0072	0.356

Continous Current Ratings Load Factor = 100% for one circuit in operation (Amperes)

Laying conditions: trefoil formation

Type of Earthing Bonding System	Cross Sectional Area	Direct burial		In air (shaded)	
					
	mm²	ρ_T=120 T = 25 °C	ρ_T=150 T = 35 °C	T = 30 °C	T = 40 °C
Bonded at both Ends	240 R	445	374	634	573
	300 R	494	415	719	649
	400 R	551	462	818	738
	500 R	632	511	930	839
Cross or single point bonding	630 R	780	608	1104	1996
	800 R	872	731	1329	1200
	1000 S	1045	875	1639	1479
	1200 S	1124	940	1777	1604
	1600 S	1294	1081	2107	1901
	2000 S	1424	1189	2359	2128
	2500 S	1565	1306	2645	2385

Laying condition: flat formation

Type of Earthing Bonding System	Cross Sectional Area	Direct Burial		In air (shaded)	
					
	mm²	ρ_T=120 T = 25 °C	ρ_T=150 T = 35 °C	T = 30 °C	T = 40 °C
Cross or single point bonding	240 R	497	420	735	666
	300 R	562	474	845	765
	400 R	640	540	979	886
	500 R	731	615	1139	1031
	630 R	832	699	1320	1195
	800 R	938	788	1521	1376
	1000 S	1115	935	1859	1682
	1200 S	1203	1009	2022	1829
	1600 S	1399	1171	2424	2192
	2000 S	1555	1301	2740	2479
	2500 S	1703	1423	3141	2751

* R: Round Conductor
* S: Segmental Conductor

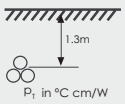
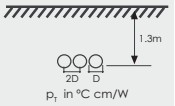
Single Core Copper Conductor, XLPE insulated, Lead Sheathed and HDPE Sheathed

Stranded circular or segmental compacted copper conductor, semi-conducting layer as conductor screen, XLPE insulated, semi-conducting layer as non metallic insulation screen,semi conductive water blocking tape to protect the screen area from longitudinal water penetration, lead sheathed with suitable thickness to withstand the required earth fault current and HDPE sheathed with graphite coating or extruded semi-conducting layer.
Cables are designed and tested to comply with IEC 60228, 60840 and 60811.

Constructional Data

Product - Code	Condutor		Thickness of Conductor Screen	Thickness of Insulation	Thickness of Insulation Screen	No. of Wires x Wire Dia	Thickness of Outer Sheath	Approx. Outer Diameter of Cable	Approx. Weight of Cable	Max. DC Conductor Resistance at 20°C	Capacitance
	Cross-Sectional Area	Shape									
	mm²		mm	mm	mm	mm	mm	mm	(kg/km)	(Ω/km)	(µf/km)
CX7-TX01-N20	240	Compact Round (R) Stranded	1.2	16	1.0	2.4	4.5	69.6	10040	0.0754	0.149
CX7-TX01-N30	300		1.2	16	1.0	2.5	4.5	72.2	11215	0.0601	0.160
CX7-TX01-N40	400		1.2	16	1.0	2.6	4.5	75.0	12600	0.0470	0.172
CX7-TX01-N50	500		1.2	16	1.0	2.7	4.5	78.6	14440	0.0366	0.188
CX7-TX01-N60	630		1.2	16	1.0	2.7	4.5	82.5	16485	0.0283	0.204
CX7-TX01-N70	800		1.2	16	1.0	2.9	4.5	86.6	19195	0.0221	0.223
CX7-TX01-N80	1000	Segmental Stranded(S) (Milliken)	1.5	16	1.2	3.0	4.5	98.1	24955	0.0176	0.261
CX7-TX01-N81	1200		1.5	16	1.2	3.1	4.5	100.5	25350	0.0151	0.269
CX7-TX01-N83	1600		1.5	16	1.2	3.3	4.5	106.8	31475	0.0113	0.306
CX7-TX01-N84	2000		1.5	16	1.2	3.5	4.5	112.2	36860	0.0090	0.328
CX7-TX01-N85	2500		1.5	16	1.2	3.7	4.5	119.9	43200	0.0072	0.356

Continous Current Ratings Load Factor = 100% for one circuit in operation (Amperes)

Laying conditions: trefoil formation						Laying condition: flat formation					
Type of Earthing Bonding System	Cross Sectional Area	Direct burial		In air (shaded)		Type of Earthing Bonding System	Cross Sectional Area	Direct Burial		In air (shaded)	
											
	mm²	ρ_T=120 T = 25 °C	ρ_T=150 T = 35 °C	T = 30 °C	T = 40 °C		mm²	ρ_T=120 T = 25 °C	ρ_T=150 T = 35 °C	T = 30 °C	T = 40 °C
Bonded at both Ends	240 R	471	397	660	597	Cross or single point bonding	240 R	497	420	737	668
	300 R	528	445	754	682		300 R	562	474	847	767
	400 R	596	501	866	782		400 R	640	540	981	889
	500 R	669	562	995	899		500 R	730	614	1141	1033
Cross or single point bonding	630 R	773	648	1162	1049		630 R	829	702	1322	1197
	800 R	861	721	1324	1195		800 R	934	784	1522	1377
	1000 S	1019	853	1618	1460		1000 S	1105	925	1852	1676
	1200 S	1091	912	1744	1574		1200 S	1187	995	2011	1820
	1600 S	1229	1026	2043	1843		1600 S	1368	1145	2398	2170
	2000 S	1331	1110	2262	2040		2000 S	1507	1260	2697	2440
	2500 S	1431	1192	2497	2252		2500 S	1661	1387	2995	2651

* R: Round Conductor
* S: Segmental Conductor

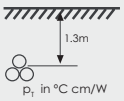
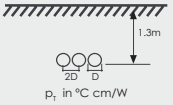
Single Core Copper Conductor, XLPE insulated, Copper Wire Screen and HDPE Sheathed

Stranded circular or segmantal compacted copper conductor, semi-conducting layer as conductor screen, XLPE insulated, semi-conducting layer as non metallic insulation screen, Semi-conductive water blocking tape, copper wire as metallic insulation screen to withstand the required earth fault current, non-conductive water blocking tape to protect the screen area from longitudinal water penetration, copolymer aluminum tape to protect the cable from radial water penetration and HDPE sheathed with graphite coating or extruded semi-conducting layer. Cables are designed and tested to comply with IEC 60228, 62067 and 60811.

Constructional Data

Product - Code	Condutor		Thickness of Conductor Screen	Thickness of Insulation	Thickness of Insulation Screen	No. of Wires x Wire Dia	Thickness of Outer Sheath	Approx. Outer Diameter of Cable	Approx. Weight of Cable	Max. DC Conductor Resistance at 20°C	Capacitance
	Cross-Sectional Area	Shape									
	mm^2		mm	mm	mm	mm	mm	mm	(kg/km)	(Ω/km)	(µf/km)
CX8-TX01-K40	400	Compact Round (R) Stranded	1.5	23	1.5	75 x 1.75	4.5	90.6	10515	0.0470	0.138
CX8-TX01-K50	500		1.5	23	1.5	75 x 1.75	4.5	94.1	11860	0.0366	0.149
CX8-TX01-K60	630		1.5	23	1.5	75 x 1.75	4.5	97.6	13405	0.0283	0.160
CX8-TX01-K70	800		1.5	23	1.5	75 x 1.75	4.5	101.9	15520	0.0221	0.174
CX8-TX01-K80	1000	Segmental Stranded(S) (Milliken)	1.5	23	1.5	75 x 1.75	5.0	110.8	18250	0.0176	0.199
CX8-TX01-K81	1200		1.5	23	1.5	75 x 1.75	5.0	112.7	20215	0..0151	0.205
CX8-TX01-K83	1600		1.5	23	1.5	75 x 1.75	5.0	121.1	24940	0.0113	0.231
CX8-TX01-K84	2000		1.5	23	1.5	75 x 1.75	5.0	126.1	28870	0.0090	0.247
CX8-TX01-K85	2500		1.5	23	1.5	75 x 1.75	5.0	132.4	34785	0.0072	0.266

Continous Current Ratings Load Factor = 100% for one circuit in operation (Amperes)

Laying conditions: trefoil formation						Laying condition: flat formation					
Type of Earthing Bonding System	Cross Sectional Area	Direct burial		In air (shaded)		Type of Earthing Bonding System	Cross Sectional Area	Direct Burial		In air (shaded)	
											
	mm^2	p_T=120 T = 25 °C	p_T=150 T = 35 °C	T = 30 °C	T = 40 °C		mm^2	p_T=120 T = 25 °C	p_T=150 T = 35 °C	T = 30 °C	T = 40 °C
Bonded at both ends	400 R	550	461	815	737	Cross or single point bonding	400 R	640	540	945	857
	500 R	653	573	929	839		500 R	728	613	1098	995
Cross or single point bonding	630 R	761	737	1146	1035		630 R	827	695	1272	1152
	800 R	847	707	1308	1182		800 R	929	779	1463	1325
	1000 S	995	829	1583	1446		1000 S	1101	922	1781	1612
	1200 S	1065	883	1712	1568		1200 S	1188	995	1935	1752
	1600 S	1191	989	2022	1857		1600 S	1356	1131	2315	2096
	2000 S	1290	1072	2232	2072		2000 S	1535	1281	2616	2367
	2500 S	1389	1150	2480	2236		2500 S	1654	1376	2876	2603

* R: Round Conductor
* S: Segmental Conductor

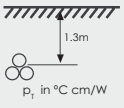
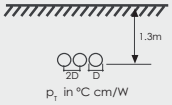
Single Core Copper Conductor, XLPE insulated, Lead Sheathed and HDPE Sheathed

Stranded circular or segmental compacted copper conductor, semi-conducting layer as conductor screen, XLPE insulated, semi-conducting layer as non metallic insulation screen,semi conductive water blocking tape to protect the screen area from longitudinal water penetration, lead sheathed with suitable thickness to withstand the required earth fault current and HDPE sheathed with graphite coating or extruded semi-conducting layer.
Cables are designed and tested to comply with IEC 60228, 62067 and 60811.

Constructional Data

Product - Code	Condutor		Thickness of Conductor Screen	Thickness of Insulation	Thickness of Insulation Screen	No. of Wires x Wire Dia	Thickness of Outer Sheath	Approx. Outer Diameter of Cable	Approx. Weight of Cable	Max. DC Conductor Resistance at 20°C	Capacitance
	Cross-Sectional Area	Shape									
	mm²		mm	mm	mm	mm	mm	mm	(kg/km)	(Ω/km)	(µf/km)
CX8-TX01-N40	400	Compact round (R) Stranded	1.5	23	1.5	3.2	4.5	91.8	17330	0.0470	0.138
CX8-TX01-N50	500		1.5	23	1.5	3.3	4.5	95.4	19365	0.0366	0.149
CX8-TX01-N60	630		1.5	23	1.5	3.4	4.5	99.1	21615	0.0283	0.160
CX8-TX01-N70	800		1.5	23	1.5	3.5	4.5	103.6	24565	0.0221	0.174
CX8-TX01-N80	1000	Segmental stranded (S) (Milliken)	1.5	23	1.5	3.6	5.0	112.9	29320	0.0176	0.199
CX8-TX01-N81	1200		1.5	23	1.5	3.9	5.0	115.2	32290	0.0151	0.205
CX8-TX01-N83	1600		1.5	23	1.5	4.1	5.0	123.8	38555	0.0113	0.231
CX8-TX01-N84	2000		1.5	23	1.5	4.2	5.0	129.4	43945	0.0090	0.247
CX8-TX01-N85	2500		1.5	23	1.5	4.4	5.0	136.9	49865	0.0072	0.266

Continous Current Ratings Load Factor = 100% for one circuit in operation (Amperes)

Laying conditions: trefoil formation						Laying condition: flat formation					
Type of Earthing Bonding System	Cross Sectional Area	Direct burial 		In air (shaded)		Type of Earthing Bonding System	Cross Sectional Area	Direct Burial 		In air (shaded)	
	mm²	ρ_T=120 T = 25 °C	ρ_T=150 T = 35 °C	T = 30 °C	T = 40 °C		mm²	ρ_T=120 T = 25 °C	ρ_T=150 T = 35 °C	T = 30 °C	T = 40 °C
Bonded at both ends	400 R	550	461	815	737		400 R	633	534	948	859
	500 R	653	574	929	829		500 R	721	607	1100	997
	630 R	761	737	1140	1030		630 R	819	688	1270	1153
	800 R	847	707	1297	1170		800 R	921	772	1462	1324
	1000 S	994	829	1573	1420	Cross or single point bonding	1000 S	1085	908	1773	1606
Cross or single point bonding	1200 S	1061	883	1696	1531		1200 S	1166	975	1924	1742
	1600 S	1191	989	1979	1786		1600 S	1283	1068	2287	2070
	2000 S	1290	1070	2191	1977		2000 S	1475	1227	1229	2326
	2500 S	1383	1145	2416	2180		2500 S	1613	1454	2822	2548

* R: Round Conductor
* S: Segmental Conductor

4 LOW SMOKE HALOGEN FREE

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Introduction to LSHF Cables

''In a fire accident some people die because of the Fire, other die because of the smoke.''

In theaters, hotels, hospitals and all closed public places we can not afford losing people by suffocation

Fire safety engineering in building design and execution plays a major role worldwide,
Alongside this process comes the requirements for electrical installations to provide greater fire protection for buildings and a safer environment for the people who use them.

Elsewedy Cables has made its contribution to safe people life by reducing the smoke rate in the fire accidents by presenting a LSHF range for power and wiring cables.

Why to use Doha Cables LSHF

1 - Doha Cables LSHF does not contain halogen:
Hydrochloric acid is not formed during the fire, so there is no hazard of suffocation by inhalation of this highly irritant chemical

2 - Doha Cables LSHF reduces smoke to the minimum:
Reducing the confusion, panic and suffocation ratio, which allow people to survive

3 - Doha Cables LSHF reduces fire propagation:
By being slow to burn, Extending the escape time and reducing the immediate hazard.

4 - Doha Cables LSHF resists ignition:
Extending the time before cables start to burn in a fire providing people light, visibility and time to escape

Doha Cables LSHF

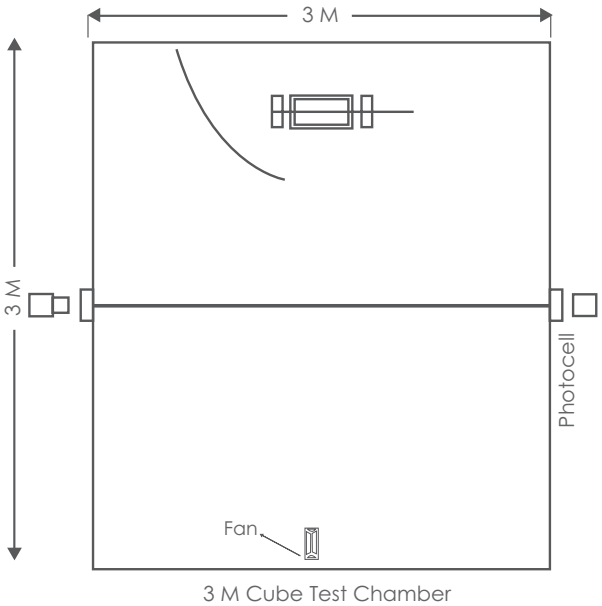
- Allows people to see and breath safely for longer time.
- Increases time for people to escape.
- Reduces damage of buildings and electronic equipment.
- Doha Cables LSHF improves safety and human survival in a fire.

LSHF Cables Tests

Traditional PVC sheathed cable on burning emits acidic gases which cause intensive irritation to the eyes and lungs and cause long term damage to electronic equipment such as computers.
Testing Halogen Free cables is conducted according to IEC 60754 and BS EN 50267 which specifies the weight of the cable material is decomposed and the evolved acidic gas is measured, it should be less Than 0.5%

Determination of the Amount of Halogen Acid Gas & Measurement of the Smoke Density of Cables:

It is a fact that most of the hazardous during fire cames from the black dense smoke emission which reduces the visibility to a point that people may not attempt to escape.
By the term low smoke we mean cables which on burning do not emit black dense smoke, so it makes the surroundings clearer and easier for people to escape during fire.
Testing of low smoke emission is conducted according to IEC 61034 & BS EN 61034 which specified as 3 M cube chamber as indicated in the figure where we start to burn a cable sample and measure the light transmission by means of photocell during the time of burning. The test is considered as ended when there is no decrease in light transmittance for 5 min. after the fire source has extinguished or when the test duration reaches 40 min.
The cable is considered as low smoke halogen free if the light transmission reduced to a certain value from the starting one at the end of the testing time.



3 M Cube Test Chamber

Plan of Low Smoke Halogen Free test chamber according to IEC 61034 & BS EN 61034

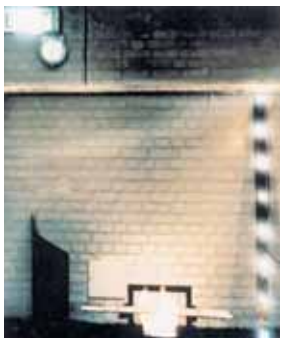
The 3 Meter Cube Smoke Test Chamber

Photos in the upper side for PVC sheathed cables and lower side shows the LSHF sheathed cables.

PVC Cables: 30 sec

PVC Cables: 3 mins

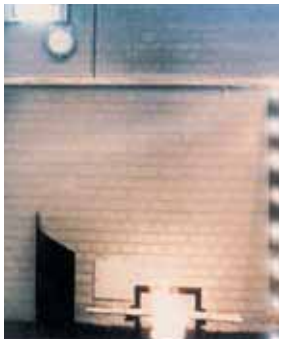
PVC Cables: 6 mins



LSHF: 30 sec

LSHF: 3 mins

LSHF: 6 mins



LSHF:12 mins

Comparison between traditional PVC & Low Smoke Halogen Free Cables when tested in accordance to IEC 61034

The comparative figure above shows the difference between the behaviour of traditional PVC and low smoke halogen free sheathed cables when tested for low smoke emission according to IEC 61034. This property helps making the public places like underground tunnels, hospitals, hotels, etc, more safer and easier for evacuation during the fire conditions.

Flame Retardant Cables Tests

In fire condition, cables are acting as a network to propagate the flame along their length such that the traditional cables and the flame to spread everywhere beside the flame location.
By the term flame retardant cables we mean using material in the cable manufacturing specially sheathing material to reduce the propagation of flame.

Testing flame retardant cables is done in accordance with IEC 60332 which specifies different parts for the test depending on the number of cables or wires, single or bunched. The figure shows the test chamber specified in IEC 60332 part 3 where a number of cable samples 3.5 meter length, determined by the total volume of non metallic material in the cable, are hanged and subjected to flame for 20 or 40 minutes and during the test time an air flow with specific rate is maintained by means of blower in the whole chamber.

The cable is considered as flame retardant if the flame did not propagate along the cable for more than 2.5 m after the flame is ceased.

Application

- Power stations.
- Petrochemical plants.
- Off shore oil platforms.
- Industrial areas.

Standard Specification

- IEC 60332
- BS EN 50266
- BS EN 60332

Fire Resistance Cables & Fire Alarm Cables

Fire Resistant Cables

The most important feature during fire condition is that the fire alarm circuit is working under the fire, in case the cables connecting the fire alarm circuits are burnt the whole alarm system is useless.

So there was a great need for a type of cables which operate under the fire conditions.Fire resistance cables provide a good system for emergency circuits where the integrity of the electric network is maintained during the fire conditions.

Testing of this property is conducted according to IEC 60331 which requires one meter of cable to be hanged and subjected to flame at 750 C for 90 min. and also according to BS 6387-which required one meter cable to be hanged and subjected to flame at 950± 40C for 180 min.

Fire Alarm Cables

Fire alarm cables are widely used in fire alarm systems, where the integrity of the circuit is required during the fire conditions for example:

- Hotels.
- Hospitals.
- Airport Terminals.
- Large public buildings.

Standard Specification

IEC 60331.

Metals Used for Cables

Table 1

Electrical properties

Metal	Relative conductivity Copper 100	Electrical resistivity at 20 °C ohm. m (10^{-8})	Temperature coefficient of resistance per °C
Copper (annealed)	100	1.7241	0.00393
Aluminium	61	2.8264	0.00403

Physical properties

Property	Unit	Copper	Aluminium
Density at 20 °C	kg / m^3	8890.0	2703.0
Coeff. thermal expansion	Per °C x 10^{-6}	17.0	23.0
Melting point	°C	1083.0	659.0
Thermal conductivity	W/cm °C	3.8	2.4
Ultimate tensile strength	Mn/m^2	225.0	70-90

Cable ampacity

Cable ampacity or current carrying capacity is defined as the continuous maximum current the cable can carry at its maximum operating temperature.
In the technical information tables the following installation conditions were assumed during the current calculation:

- Ambient air temperature = 40 °C
- Ground temperature = 35 °C
- Ground thermal resistivity = 120 °C. Cm/Watt
- Burial depth = 0.5 Mt.

- In case of different installation conditions from the stated, the derating factors tabulated in tables 2 to 9 must be used in calculating the new current carrying capacity.

Derating Factors

Table 2

Ground temperature derating factors

Ground temperature °C	15	20	25	30	35	40	45	50	55
XLPE cables rated 90 °C	1.16	1.13	1.09	1.04	1	0.95	0.9	0.85	0.8

Table 3

Air temperature derating factors

Air temperature °C	20	25	30	35	40	45	50	55
XLPE cables rated 90 °C	1.18	1.14	1.1	1.05	1	0.9	0.89	0.84

Table 4

Burial depth derating factors

Depth of laying mt.	Cables cross section		
	Up to 70 mm^2	95 up to 240 mm^2	300 mm^2 & above
0.50	1.00	1.00	1.00
0.60	0.99	0.98	0.97
0.80	0.97	0.96	0.94
1.00	0.95	0.93	0.92
1.25	0.94	0.92	0.89
1.50	0.93	0.90	0.87
1.75	0.92	0.89	0.86
2.00	0.91	0.88	0.85

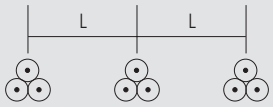
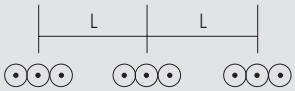
Table 5

Soil thermal resistivity derating factors

Soil thermal resistivity in °C. Cm/Watt	80	90	100	120	150	200	250	300
Rating factor	1.17	1.12	1.07	1.0	0.91	0.80	0.73	0.67

Table 6

Trefoil or flat formation derating factors for three single core cables laid direct in ground

Number of Circuits	 Trefoil formation			 Flat formation		
	Touching		Spacing = 0.15 M		Spacing = 0.30 M	
nr	Trefoil	Flat	Trefoil	Flat	Trefoil	Flat
2	0.77	0.80	0.82	0.85	0.88	0.91
3	0.66	0.69	0.73	0.76	0.80	0.83
4	0.60	0.63	0.68	0.71	0.74	0.77
5	0.56	0.59	0.64	0.67	0.72	0.75
6	0.53	0.57	0.61	0.64	0.70	0.73

** L = Spacing*

Table 7

Trefoil formation derating factors for multi-core core cables laid direct in ground

Number of Circuits	Trefoil formation				Flat formation	
	Touching		Spacing = 0.15 M		Spacing = 0.30 M	
nr	Trefoil	Flat	Trefoil	Flat	Trefoil	Flat
2	0.81	0.81	0.87	0.87	0.91	0.91
3	0.69	0.70	0.76	0.78	0.82	0.84
4	0.62	0.63	0.72	0.74	0.77	0.81
5	0.58	0.60	0.66	0.70	0.73	0.78
6	0.54	0.56	0.63	0.67	0.70	0.76

** L = Spacing*

Table 8

Reduction factors for groups of more than one multi-core cable in air
To be applied to the current-carrying capacity for one multi-core cable in free air

Number of Trays	Number of circuits						Laying form
	1	2	3	4	6	9	
1	1.00	0.88	0.82	0.79	0.76	0.73	Cables on perforated trays — Touching
2	1.00	0.87	0.80	0.77	0.73	0.68	
3	1.00	0.86	0.79	0.76	0.71	0.66	
1	1.00	1.00	0.98	0.95	0.91	-	Cables on perforated trays — Spaced
2	1.00	0.99	0.96	0.92	0.87	-	
3	1.00	0.98	0.95	0.91	0.85	-	
1	1.00	0.88	0.82	0.78	0.73	0.72	Cables on vertical perforated trays — Touching
2	1.00	0.88	0.81	0.76	0.71	0.70	
1	1.00	0.91	0.89	0.88	0.87	-	Cables on vertical perforated trays — Spaced
2	1.00	0.91	0.88	0.87	0.85	-	
1	1.00	0.87	0.82	0.80	0.79	0.78	Cables on ladder supports, cleats, etc. — Touching
2	1.00	0.86	0.80	0.78	0.76	0.73	
3	1.00	0.85	0.79	0.76	0.73	0.70	
1	1.00	1.00	1.00	1.00	1.00	-	Cables on ladder supports, cleats, etc. — Spaced
2	1.00	0.99	0.98	0.97	0.96	-	
3	1.00	0.98	0.97	0.96	0.93	-	

NOTE 1 Values given are averages for the cable types and range of conductor sizes considered. The spread of values is generally less than 5%.

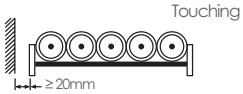
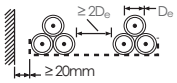
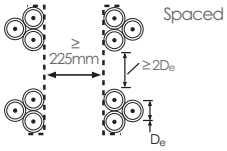
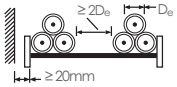
NOTE 2 Factors apply to single layer groups of cables as shown above and do not apply when cables are installed in more than one layer touching each other. Values for such installations may be significantly lower and must be determined by an appropriate method.

NOTE 3 Values are given for vertical spacing between trays of 300 mm and at least 20 mm between trays and wall. For closer spacing, the factors should be reduced.

NOTE 4 Values are given for horizontal spacing between trays of 225 mm with trays mounted back to back. For closer spacing the factors should be reduced.

Table 9

Reduction factors for groups of more than one circuit of single-core cables (Note 2)
To be applied to the current-carrying capacity for one circuit of single-core cables in free air

Number of Trays	Number of circuits 1	2	3	Use as a multiplier to rating for	Method of installation
1	0.98	0.91	0.87	Three cables in horizontal formation	Perforated trays (Note 3)
2	0.96	0.87	0.81		
3	0.95	0.85	0.78		
1	1.00	0.97	0.96	Three cables in horizontal formation	Ladder supports, cleats, etc. (Note 3) 
2	0.98	0.93	0.89		
3	0.97	0.90	0.86		
1	1.00	0.98	0.96	Three cables in trefoil formation	Perforated trays (Note 3) 
2	0.97	0.93	0.89		
3	0.96	0.92	0.86		
1	1.00	0.91	0.89		Vertical perforated trays (Note 4) 
2	1.00	0.90	0.86		
1	1.00	1.00	1.00		Ladder supports, cleats, etc. (Note 3) 
2	0.97	0.95	0.93		
3	0.96	0.94	0.90		

NOTE 1 Values given are averages for the cable types and range of conductor sizes considered. The spread of values is generally less than 5%.

NOTE 2 Factors are given for single layers of cables (or trefoil groups) as shown in the table and do not apply when cables are installed in more than one layer touching each other. Values for such installations may be significantly lower and should be determined by an appropriate method.

NOTE 3 Values are given for vertical spacings between trays of 300 mm. For closer spacing, the factors should be reduced.

NOTE 4 Values are given for horizontal spacing between trays of 225 mm with trays mounted back to back. For closer spacing, the factors should be reduced.

NOTE 5 For circuits having more than one cable in parallel per phase, each three phase set of conductors should be considered as a circuit for the purpose of this table.

Short Circuit Current

Table 10

kA short circuit current - Copper conductor - XLPE insulated or LSHF insulated

C.S.A. mm²	Duration sec.									
	0.1	0.2	0.3	0.4	0.5	1.0	2.0	3.0	4.0	5.0
16	7.2	5.1	4.2	3.6	3.2	2.3	1.6	1.3	1.1	1.02
25	11.3	8.0	6.5	5.7	5.1	3.6	2.5	2.1	1.8	1.60
35	15.8	11.2	9.1	7.9	7.1	5.0	3.5	2.9	2.5	2.24
50	22.6	16.0	13.1	11.3	10.1	7.2	5.1	4.1	3.6	3.20
70	31.7	22.4	18.3	15.8	14.2	10.0	7.1	5.8	5.0	4.5
95	43.0	30.4	24.8	21.5	19.2	13.6	9.6	7.8	6.8	6.1
120	54.3	38.4	31.3	27.1	24.3	17.2	12.1	9.9	8.6	7.7
150	67.8	48.0	39.2	33.9	30.3	21.5	15.2	12.4	10.7	9.6
185	83.7	59.2	48.3	41.8	37.4	26.5	18.7	15.3	13.2	11.8
240	108.5	76.7	62.7	54.3	48.5	34.3	24.3	19.8	17.2	15.3
300	135.7	95.9	78.3	67.8	60.7	42.9	30.3	24.8	21.5	19.2
400	180.9	127.9	104.4	90.4	80.9	57.2	40.4	33.0	28.6	25.6
500	226.1	159.9	130.5	113.1	101.1	71.5	50.6	41.3	35.8	32.0
630	284.9	201.4	164.5	142.4	127.4	90.1	63.7	52.0	45.0	40.3
800	361.8	255.8	208.9	180.9	161.8	114.4	80.9	66.0	57.2	51.2
1000	452.2	319.8	261.1	226.1	202.2	143.0	101.1	82.6	71.5	64.0
1200	542.6	383.7	313.3	271.3	242.7	171.6	121.3	99.1	85.8	76.7
1600	723.5	511.6	417.7	361.8	323.6	228.8	161.8	132.1	114.4	102.3
2000	904.4	639.5	522.2	452.2	404.5	286	202.2	165.1	143	127.9

Table 11

kA short circuit current - Aluminium conductor - XLPE insulated or LSHF insulated

C.S.A. mm²	Duration sec.									
	0.1	0.2	0.3	0.4	0.5	1.0	2.0	3.0	4.0	5.0
16	4.7	3.4	2.7	2.4	2.1	1.5	1.1	0.9	0.75	0.67
25	7.4	5.2	4.3	3.7	3.3	2.3	1.7	1.4	1.2	1.0
35	10.4	7.3	6.0	5.2	4.6	3.3	2.3	1.9	1.6	1.5
50	14.8	10.5	8.6	7.4	6.6	4.7	3.3	2.7	2.3	2.1
70	20.7	14.7	12.0	10.4	9.3	6.6	4.6	3.8	3.3	2.9
95	28.1	19.9	16.3	14.1	12.6	8.9	6.3	5.1	4.5	4.0
120	35.6	25.1	20.5	17.8	15.9	11.2	8.0	6.5	5.6	5.0
150	44.4	31.4	25.7	22.2	19.9	14.1	9.9	8.1	7.0	6.3
185	54.8	38.8	31.6	27.4	24.5	17.3	12.3	10.0	8.7	7.8
240	71.1	50.3	41.1	35.6	31.8	22.5	15.9	13.0	11.2	10.1
300	88.9	62.9	51.3	44.4	39.8	28.1	19.9	16.2	14.1	12.6
400	118.5	83.8	68.4	59.3	53.0	37.5	26.5	21.6	18.7	16.8
500	148.2	104.8	85.5	74.1	66.3	46.9	33.1	27.0	23.4	21.0
630	186.7	132.0	107.8	93.3	83.5	59.0	41.7	34.1	29.5	26.4
800	237.0	167.6	136.9	118.5	106.0	75.0	53.0	43.3	37.5	33.5
1000	296.3	209.5	171.1	148.2	132.5	93.7	66.3	54.1	46.9	41.9
1200	355.6	251.4	205.3	177.8	159.0	112.4	79.5	64.9	56.2	50.3
1600	474.1	335.2	273.7	237	212	149.9	106	86.6	75	67
2000	592.6	419	342.1	296.3	265	187.4	132.5	108.2	93.7	83.8

Conductor temperature before short Circuit = 90° C
Maximum conductor temperature during short Circuit = 250° C

Voltage Drop

Table 12

Voltage drop for single core L.V cables

C.S.A mm^2	Copper conductor	
	Voltage drop (mv / AMP / Meter)	
	XLPE or LSHF insulation & LSHF sheathed	
	Flat ○○○	Trefoil
4	8.337	8.277
6	5.628	5.568
10	3.401	3.341
16	2.203	2.142
25	1.440	1.380
35	1.085	1.024
50	0.836	0.776
70	0.624	0.564
95	0.490	0.430
120	0.417	0.357
150	0.366	0.305
185	0.322	0.262
240	0.278	0.218
300	0.253	0.192
400	0.220	0.159
500	0.211	0.150
630	0.191	0.131

C.S.A mm^2	Aluminium conductor	
	Voltage drop (mv / AMP / Meter)	
	XLPE or LSHF insulation & LSHF sheathed	
	Flat ○○○	Trefoil
16	3.561	3.500
25	2.296	2.235
35	1.700	1.640
50	1.291	1.230
70	0.937	0.877
95	0.719	0.655
120	0.594	0.534
150	0.511	0.451
185	0.437	0.377
240	0.367	0.307
300	0.322	0.262
400	0.278	0.218
500	0.260	0.199
630	0.223	0.163

The above data are based on:
Max. operating temp: 90 °C for XLPE
Power factor: 0.8 Rated frequency: 50 HZ
Cables are touched in flat formation

Table 13

Voltage drop for multi core L.V cables

C.S.A mm^2	Copper conductor Voltage drop (mv / AMP / Meter) XLPE insulation & LSHF sheathed
1.5	20.341
2.5	13.197
4	7.731
6	5.191
10	3.094
16	1.982
25	1.276
35	0.955
50	0.715
70	0.520
95	0.394
120	0.337
150	0.282
185	0.241
240	0.201
300	0.177
400	0.155

C.S.A mm^2	Aluminium conductor Voltage drop (mv / AMP / Meter) XLPE insulation & LSHF sheathed
16	3.479
25	2.218
35	1.624
50	1.217
70	0.865
95	0.645
120	0.524
150	0.442
185	0.369
240	0.299
300	0.255
400	0.211

The above data are based on:
Max. operating temp: 90 °C for XLPE
Power factor : 0.8 Rated frequency: 50 HZ
Cables are touched in flat formation

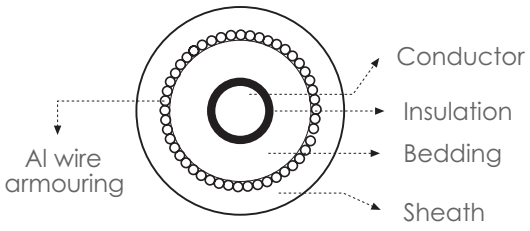
Low Voltage LSHF Cables

Operating Voltage (up to 0.6/1 kV)

Cable Construction

1. **Conductor:**
   Copper or Aluminium conductors, solid, flexible or stranded with round or sectoral shaped conductors.
2. **Insulation:**
   An extruded layer of XLPE is applied over the conductor. Insulated cables are suitable for maximum conductor operating temperature of 90 °C.
3. **Assembly:**
   In case of multicore cables cores are assembled together.
4. **Bedding:**
   In case of armoured cables an extruded layer of LSHF is applied as bedding.
5. **Armouring:**
   Steel Wire: Galvanized steel wires are applied helically.
6. **Sheath:**
   An extruded layer of LSHF is applied as an outer sheath.

Armouring of Single Core Cable



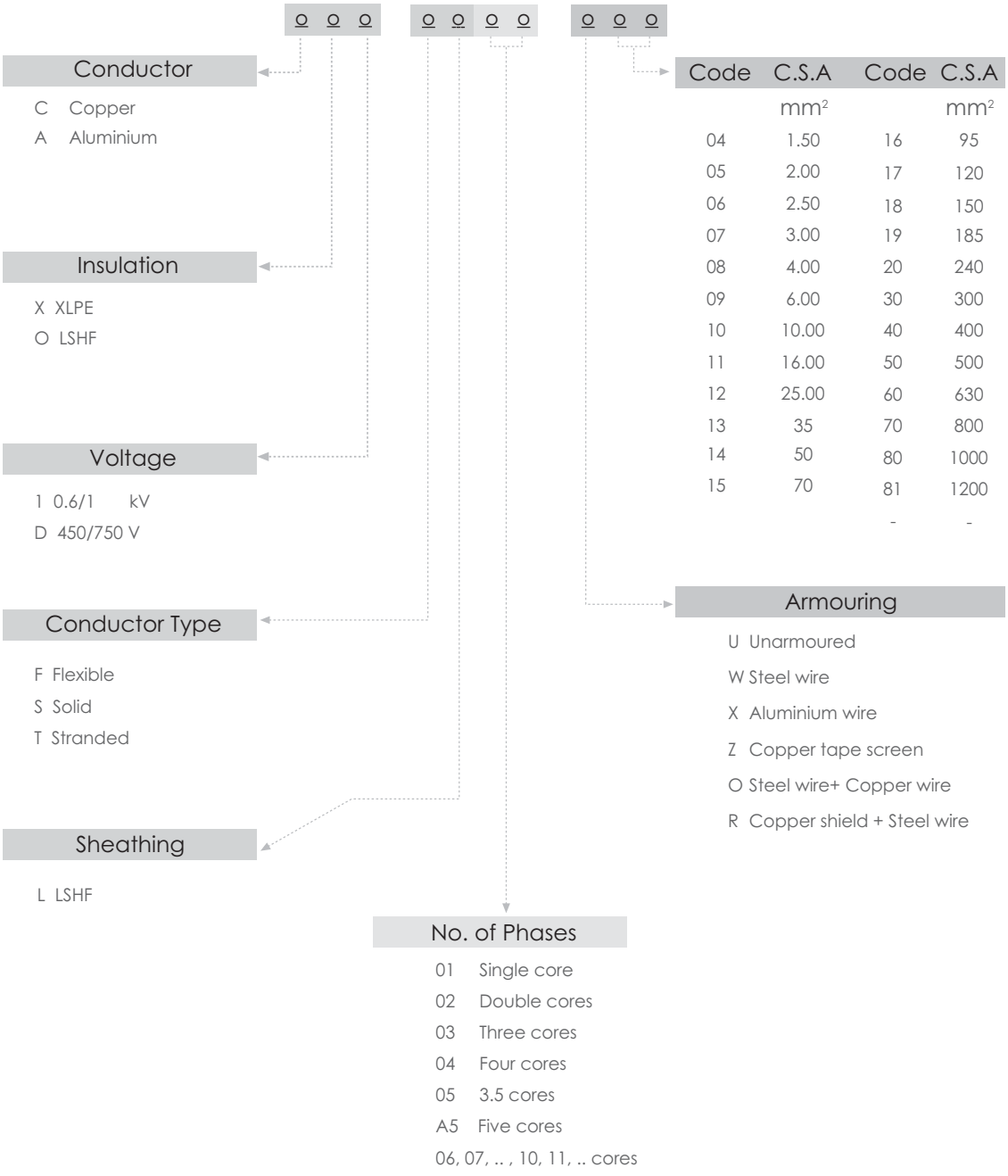
Armouring of Single Core Cable

Armouring by non- magnetic material such as Aluminium Wire armouring to reduce the magnetic losses.

System Designation for Low Voltage Cable

You can order our product by giving the following information:

1. Cable code as per the catalogue.
2. If your required cable is out of our catalogue range, you can use the following codes to determine your cable.



Code	C.S.A	Code	C.S.A
	mm²		mm²
04	1.50	16	95
05	2.00	17	120
06	2.50	18	150
07	3.00	19	185
08	4.00	20	240
09	6.00	30	300
10	10.00	40	400
11	16.00	50	500
12	25.00	60	630
13	35	70	800
14	50	80	1000
15	70	81	1200
		-	-

Single Core Cables, with Solid or Stranded Copper Conductors and LSHF Insulated (450/750 V)

Description

- Soft annealed solid or stranded Copper conductors insulated with LSHF compound rated 90 °c according to BS 7211and BS EN 60332-1.

Application

For indoor fixed installations in dry locations, laid in conduits, as well as in steel support brackets.

Product - code	Nominal cross sectional area		Max. Conductor resistance		Current rating in air				
					Free Air			Pipes	
					Horizontal flat spaced	Vertical flat spaced	Terfoil	Enclosed in conduit on a wall or in turnking etc.	
			DC at 20 °C	AC at 90 °C	2 cables, Single phase a.c. or d.c. or 3 cables three phases	2 cables, Single phase a.c. or d.c. or 3 cables three phases	3 cables, terfoil, three phases	2 cables, Single phase a.c. or d.c.	3 or 4 cables, three phase
	mm^2		Ω/km	Ω/km	A	A	A	A	A
COD-S001-U04	1.5	re	12.1000	15.4000	-	-	-	20	17
COD-T001-U04	1.5	rm	12.1000	15.4000	-	-	-	20	17
COD-S001-U06	2.5	re	7.4100	9.4500	-	-	-	27	23
COD-T001-U06	2.5	rm	7.4100	9.4500	-	-	-	27	23
COD-S001-U08	4	re	4.6100	5.8800	-	-	-	36	31
COD-T001-U08	4	rm	4.6100	5.8800	-	-	-	36	31
COD-S001-U09	6	re	3.0800	3.9300	-	-	-	46	40
COD-T001-U09	6	rm	3.0800	3.9300	-	-	-	46	40
COD-T001-U10	10	rm	1.8300	2.3300	-	-	-	64	57
COD-T001-U11	16	rm	1.1500	1.4700	-	-	-	86	77
COD-T001-U12	25	rm	0.7270	0.9270	166	148	125	114	101
COD-T001-U13	35	rm	0.5240	0.6690	205	184	155	141	125
COD-T001-U14	50	rm	0.3870	0.4940	249	223	190	171	152
COD-T001-U15	70	rm	0.2680	0.3430	319	289	245	218	194
COD-T001-U16	95	rm	0.1930	0.2480	387	353	300	263	235
COD-T001-U17	120	rm	0.1533	0.1970	450	412	350	305	272
COD-T001-U18	150	rm	0.1240	0.1600	518	476	404	341	298
COD-T001-U19	185	rm	0.0991	0.1290	592	546	465	387	336
COD-T001-U20	240	rm	0.0754	0.0990	699	647	551	455	394
COD-T001-U30	300	rm	0.0601	0.0810	805	749	637	520	448
COD-T001-U40	400	rm	0.0470	0.0638	968	903	745	620	530

The above data is approximate and subjected to manufacturing tolerance.

re : Round, Solid
rm : Round, Stranded

Single Core Cables, with Flexible Copper Conductors and LSHF Insulated (450/750 V)

Description

- Soft annealed Copper fine wires, bunched together in sub - units or stranded bunched groups into a main units, which forms the flexible conductor.Insulated with LHSF compund rated 90 °C.
- Cables are produced according to BS 7211 and BS EN 60332-1

Application

For indoor fixed installations in dry locations, where particular flexibility is required. For electrical panels connection or for electrical apparatus they can be laid in groups around steek sheets.

Product - code	Nominal cross sectional area	Max. Conductor resistance		Current rating in air				
				Free Air			Pipes	
				Horizontal flat spaced	Vertical flat spaced	Terfoil	Enclosed in conduit on a wall or in turnking etc.	
		DC at 20 °C	AC at 90 °C	2 cables, Single phase a.c. or d.c. or 3 cables three phases	2 cables, Single phase a.c. or d.c. or 3 cables three phases	3 cables, terfoil, three phases	2 cables, Single phase a.c. or d.c.	3 or 4 cables, three phases
	mm^2	Ω/km	Ω/km	A	A	A	A	A
COD-F001-U04	1.5	13.3000	16.9590	-	-	-	20	17
COD-F001-U06	2.5	7.9800	10.1750	-	-	-	27	23
COD-F001-U08	4	4.9500	6.3120	-	-	-	36	31
COD-F001-U09	6	3.3000	4.2080	-	-	-	46	40
COD-F001-U10	10	1.9100	2.4360	-	-	-	64	57
COD-F001-U11	16	1.2100	1.5430	-	-	-	86	77
COD-F001-U12	25	0.7800	0.9550	166	148	125	114	101
COD-F001-U13	35	0.5540	0.7070	205	184	155	141	125
COD-F001-U14	50	0.3860	0.4930	249	223	190	171	152
COD-F001-U15	70	0.2720	0.3480	319	289	245	218	194
COD-F001-U16	95	0.2060	0.2640	387	353	300	263	235
COD-F001-U17	120	0.1610	0.2070	450	412	350	305	272
COD-F001-U18	150	0.1290	0.1670	518	476	404	341	298
COD-F001-U19	185	0.1060	0.1380	592	546	465	387	336
COD-F001-U20	240	0.0801	0.1050	699	647	551	455	394

The above data is approximate and subjected to manufacturing tolerance.

Single Core Cables, with Stranded Circular Copper Conductors, XLPE Insulated and LSHF Sheathed

Description

- Soft annealed stranded Copper or Aluminium conductor. Insulated with XLPE compound rated 90 °C and sheathed with LSHF Compound layer.
- Cables are produced according to IEC 60502-1 and IEC 60332-1

Application

For outdoor and indoor installations in damp and wet locations. They are normally used for power distribution in urban networks, industrial plants, as well as in thermopower and hydropower stations.

Product - code	Nominal cross sectional area	Max. Conductor resistance		Current rating						Approx. overall diameter	Approx. weight
		DC at 20 °C	AC at 90 °C	Laid in ground			Laid in free air				
				⊙⊙⊙	⁂	⊚	⊙	⊙⊙⊙	⁂		
	mm^2	Ω/km	Ω/km	A	A	A	A	A	A	mm	kg/km
a - Copper conductors											
CX1-TL01-U08	4	4.6100	5.8800	55	51	40	53	47	40	6.8	80
CX1-TL01-U09	6	3.0800	3.9300	68	65	53	65	59	53	7.3	105
CX1-TL01-U10	10	1.8300	2.3300	98	86	68	84	79	68	8.3	150
CX1-TL01-U11	16	1.1500	1.4700	116	111	87	116	110	95	9.3	210
CX1-TL01-U12	25	0.7270	0.9270	150	142	110	143	137	121	11.0	315
CX1-TL01-U13	35	0.5240	0.6690	179	172	137	179	173	152	12.1	410
CX1-TL01-U14	50	0.3870	0.4940	210	200	163	221	210	184	13.8	555
CX1-TL01-U15	70	0.2680	0.3430	263	247	200	278	268	236	15.7	760
CX1-TL01-U16	95	0.1930	0.2480	310	294	242	347	336	289	17.7	1015
CX1-TL01-U17	120	0.1530	0.1970	357	336	273	404	394	341	19.6	1280
CX1-TL01-U18	150	0.1240	0.1600	394	373	310	457	446	389	21.8	1570
CX1-TL01-U19	185	0.0991	0.1290	452	425	352	530	520	441	23.9	1920
CX1-TL01-U20	240	0.0754	0.0990	520	488	404	651	641	536	27.1	2530
CX1-TL01-U30	300	0.0601	0.0810	588	546	457	824	756	620	29.7	3105
CX1-TL01-U40	400	0.0470	0.0638	672	620	515	893	872	714	33.9	4135
CX1-TL01-U50	500	0.0366	0.0517	761	693	572	1008	987	814	37.4	5110
CX1-TL01-U60	630	0.0283	0.0425	872	777	651	1155	1134	956	41.9	6455
CX1-TL01-U70	800	0.0221	0.0292	957	861	735	1313	1292	1092	46.8	8260
CX1-TL01-U80	1000	0.0176	0.0234	1082	935	798	1449	1428	1208	51.5	10075

The above data is approximate and subjected to manufacturing tolerance.

Product - code	Nominal cross sectional area	Max. Conductor resistance		Current rating						Approx. overall diameter	Approx. weight
		DC at 20 °C	AC at 90 °C	Laid in ground			Laid in free air				
	mm^2	Ω/km	Ω/km	A	A	A	A	A	A	mm	kg/km
b - Aluminium conductors											
AX1-TL01-U11	16	1.9100	2.4500	89	87	66	89	84	63	9.3	115
AX1-TL01-U12	25	1.2000	1.5400	113	110	84	116	110	95	11.0	165
AX1-TL01-U13	35	0.8680	1.1130	137	131	105	142	137	121	12.1	205
AX1-TL01-U14	50	0.6410	0.8220	163	155	121	173	168	147	13.8	260
AX1-TL01-U15	70	0.4430	0.5690	200	189	152	221	215	179	15.7	340
AX1-TL01-U16	95	0.3200	0.4110	236	226	179	284	273	215	17.7	450
AX1-TL01-U17	120	0.2530	0.3250	278	263	215	326	315	242	19.6	550
AX1-TL01-U18	150	0.2060	0.2650	310	294	236	373	362	299	21.8	670
AX1-TL01-U19	185	0.1640	0.2120	352	336	267	436	420	336	23.9	830
AX1-TL01-U20	240	0.1250	0.1630	410	389	315	515	499	399	27.1	1050
AX1-TL01-U30	300	0.1000	0.1310	467	436	357	578	567	462	29.7	1300
AX1-TL01-U40	400	0.0778	0.1000	541	504	410	693	677	541	33.9	1610
AX1-TL01-U50	500	0.0605	0.0870	609	567	467	809	788	630	37.4	2000
AX1-TL01-U60	630	0.0469	0.0620	698	646	536	945	924	746	41.9	2520
AX1-TL01-U70	800	0.0367	0.0560	788	704	599	1071	1050	851	46.8	3150
AX1-TL01-U80	1000	0.0291	0.0470	872	767	651	1176	1155	966	51.5	3870

The above data is approximate and subjected to manufacturing tolerance.

Multicore Cables, with Stranded, Copper Conductors, XLPE Insulated and LSHF Sheathed

Description

- Multicore cables of stranded Copper conductors are insulated with XLPE compound, assembled together and covered with an overall jacket of LSHF compound.
- Cables are produced according to IEC 60502-1.

Application

For outdoor and indoor installations in damp and wet locations. They are normally used for power distribution in urban networks, in industrial plants, as well as in Thermopower and Hydropower stations.

Product - code	Nominal cross sectional area	Max. conductor resistance		Current rating			Approx. overall diameter	Approx. weight
		DC at 20 °C	AC at 90 °C	Laid direct in ground	Laid in ducts	Laid in free air		
	mm^2	Ω/km	Ω/km	A	A	A	mm	kg/km
Two core cables								
CX1-TL02-U04	1.5 rm	12.1000	15.4000	30	25	25	9.6	105
CX1-TL02-U06	2.5 rm	7.4100	9.4500	37	32	34	10.5	135
CX1-TL02-U08	4 rm	4.6100	5.8800	50	40	46	11.7	175
CX1-TL02-U09	6 rm	3.0800	3.9300	63	52	60	12.7	225
CX1-TL02-U10	10 rm	1.8300	2.3300	82	69	79	14.7	340
CX1-TL02-U11	16 rm	1.1500	1.4700	106	83	105	16.7	470
CX1-TL02-U12	25 rm	0.7270	0.9270	139	107	139	20.1	695
CX1-TL02-U13	35 rm	0.5240	0.6690	166	134	166	22.3	875
Three core cables								
CX1-TL03-U04	1.5 rm	12.1000	15.4000	26	23	22	10.1	130
CX1-TL03-U06	2.5 rm	7.4100	9.4500	35	29	32	11.0	165
CX1-TL03-U08	4 rm	4.6100	5.8800	45	36	41	12.3	225
CX1-TL03-U09	6 rm	3.0800	3.9300	57	45	50	13.4	295
CX1-TL03-U10	10 rm	1.8300	2.3300	75	60	68	15.6	455
CX1-TL03-U11	16 rm	1.1500	1.4700	97	75	89	17.7	645
CX1-TL03-U12	25 rm	0.7270	0.9270	128	102	120	21.4	965
CX1-TL03-U13	35 rm	0.5240	0.6690	155	120	145	23.8	1260

The above data is approximate and subjected to manufacturing tolerance.

Product - code	Nominal cross sectional area		Max. conductor resistance		Current rating			Approx. overall diameter	Approx. weight
			DC at 20 °C	AC at 90 °C	Laid direct in ground	Laid in ducts	Laid in free air		
	mm^2		Ω/km	Ω/km	A	A	A	mm	kg/km
Four core cables									
CX1-TL04-U04	1.5	rm	12.1000	15.4000	26	23	22	10.6	150
CX1-TL04-U06	2.5	rm	7.4100	9.4500	35	29	32	11.9	205
CX1-TL04-U08	4	rm	4.6100	5.8800	45	36	41	13.4	280
CX1-TL04-U09	6	rm	3.0800	3.9300	57	45	50	14.6	365
CX1-TL04-U10	10	rm	1.8300	2.3300	75	60	68	17.0	575
CX1-TL04-U11	16	rm	1.1500	1.4700	97	75	89	19.4	825
CX1-TL04-U12	25	rm	0.7270	0.9270	128	102	120	23.5	1245
CX1-TL04-U13	35	rm	0.5240	0.6690	155	120	145	23.6	1530
CX1-TL04-U14	50	sm	0.3870	0.4940	185	145	179	27.1	2060
CX1-TL04-U15	70	sm	0.2680	0.3430	220	180	225	31.4	2905
CX1-TL04-U16	95	sm	0.1930	0.2480	265	210	268	35.1	3910
CX1-TL04-U17	120	sm	0.1530	0.1970	305	245	310	39.2	4915
CX1-TL04-U18	150	sm	0.1240	0.1600	335	275	352	43.7	6035
CX1-TL04-U19	185	sm	0.0991	0.1290	375	310	404	48.7	7540
CX1-TL04-U20	240	sm	0.0754	0.0990	435	365	483	54.5	9785
CX1-TL04-U30	300	sm	0.0601	0.0810	490	405	562	60.1	12190
CX1-TL04-U40	400	sm	0.0470	0.0642	579	476	660	66.9	15540
CX1-TL04-U50	500	sm	0.0366	0.0519	653	546	762	74.4	20075
Four core cables with reduced neutral									
CX1-TL05-U13	35 rm	16 rm	0.5240/1.1500	0.6690/1.4700	155	120	142	22.5	1360
CX1-TL05-U14	50 sm	25 rm	0.3870/0.7270	0.4940/0.9270	185	145	179	25.9	1835
CX1-TL05-U15	70 sm	35 rm	0.2680/0.5240	0.3430/0.6690	220	180	215	29.7	2540
CX1-TL05-U16	95 sm	50 sm	0.1930/0.3870	0.2480/0.4940	265	210	268	33.6	3435
CX1-TL05-U17	120 sm	70 sm	0.1530/0.2680	0.1970/0.3430	305	245	310	37.5	4400
CX1-TL05-U18	150 sm	70 sm	0.1240/0.2680	0.1600/0.3430	335	275	352	41.3	5255
CX1-TL05-U19	185 sm	95 sm	0.0991/0.1930	0.1290/0.2480	375	310	404	46.2	6640
CX1-TL05-U20	240 sm	120 sm	0.0754/0.1530	0.0990/0.1970	435	365	483	51.5	8555
CX1-TL05-U30	300 sm	150 sm	0.0601/0.1240	0.0810/0.1600	490	405	562	56.8	10640
CX1-TL05-U40	400 sm	185 sm	0.0470/0.0991	0.0642/0.1290	579	476	660	62.8	14440
CX1-TL05-U50	500 sm	240 sm	0.0366/0.0754	0.0519/0.0990	653	546	762	70.1	18295

The above data is approximate and subjected to manufacturing tolerance.

rm : Round, Stranded
sm : Sector, Stranded

Multicore Cables, with Stranded, Aluminum Conductors, XLPE Insulated and LSHF Sheathed

Description

- Multicore cables of stranded Aluminium conductors are insulated with XLPE compound, assembled together and covered with an overall jacket of LSHF compound.
- Cables are produced according to IEC 60502.

Application

For outdoor and indoor installations in damp and wet locations. They are normally used for power distribution in urban networks, in industrial plants, as well as in Thermopower and Hydropower stations.

Product - code	Nominal cross sectional area	Max. conductor resistance		Current rating			Approx. overall diameter	Approx. weight
		DC at 20 °C	AC at 90 °C	Laid direct in ground	Laid in ducts	Laid in free air		
	mm^2	Ω/km	Ω/km	A	A	A	mm	kg/km
Two core cables								
AX1-TL02-U10	10 rm	3.0800	3.9500	57	48	55	14.7	335
AX1-TL02-U11	16 rm	1.9100	2.4500	74	58	73	16.7	450
AX1-TL02-U12	25 rm	1.2000	1.5400	97	75	97	20.1	640
AX1-TL02-U13	35 rm	0.8680	1.1130	128	106	120	22.3	780
Three core cables								
AX1-TL03-U10	10 rm	3.0800	3.9500	52	42	48	15.6	375
AX1-TL03-U11	16 rm	1.9100	2.4500	68	52	62	17.7	605
AX1-TL03-U12	25 rm	1.2000	1.5400	90	71	84	21.4	835
AX1-TL03-U13	35 rm	0.8680	1.1130	120	95	105	23.8	1050
Four core cables								
AX1-TL04-U10	10 rm	3.0800	3.9500	52	42	48	17.0	450
AX1-TL04-U11	16 rm	1.9100	2.4500	68	52	62	19.4	700
AX1-TL04-U12	25 rm	1.2000	1.5400	90	71	84	23.5	925
AX1-TL04-U13	35 rm	0.8680	1.1130	120	95	110	23.6	800
AX1-TL04-U14	50 sm	0.6410	0.8220	145	110	136	27.1	950
AX1-TL04-U15	70 sm	0.4430	0.5690	175	140	168	31.4	1260
AX1-TL04-U16	95 sm	0.3200	0.4110	210	165	205	35.1	1650
AX1-TL04-U17	120 sm	0.2530	0.3250	235	190	236	39.2	2060
AX1-TL04-U18	150 sm	0.2060	0.2650	265	215	278	43.7	2520
AX1-TL04-U19	185 sm	0.1640	0.2120	290	240	315	48.7	3140
AX1-TL04-U20	240 sm	0.1250	0.1630	340	280	378	54.5	4020
AX1-TL04-U30	300 sm	0.1000	0.1310	390	315	446	60.1	4930
AX1-TL04-U40	400 sm	0.0778	0.1025	461	379	526	66.9	5975
AX1-TL04-U50	500 sm	0.0605	0.0810	527	441	615	74.4	7485

The above data is approximate and subjected to manufacturing tolerance.

Product - code	Nominal cross sectional area		Max. conductor resistance		Current rating			Approx. overall diameter	Approx. weight
			DC at 20 °C	AC at 90 °C	Laid direct in ground	Laid in ducts	Laid in free air		
	mm^2		Ω/km	Ω/km	A	A	A	mm	kg/km
Four core cables with reduced neutral									
AX1-TL05-U13	35 rm	16 rm	0.8680/1.9100	1.1130/2.4500	121	96	110	22.5	610
AX1-TL05-U14	50 sm	25 rm	0.6410/1.2000	0.8220/1.5400	145	116	136	25.9	925
AX1-TL05-U15	70 sm	35 rm	0.4430/0.8680	0.5690/1.1130	178	142	171	29.7	1255
AX1-TL05-U16	95 sm	50 sm	0.3200/0.6410	0.4110/0.8220	214	171	211	33.6	1630
AX1-TL05-U17	120 sm	70 sm	0.2530/0.4430	0.3250/0.5690	243	195	246	37.5	2030
AX1-TL05-U18	150 sm	70 sm	0.2060/0.4430	0.2650/0.5690	272	220	282	41.3	2515
AX1-TL05-U19	185 sm	95 sm	0.1640/0.3200	0.2120/0.4110	309	250	326	46.2	3095
AX1-TL05-U20	240 sm	120 sm	0.1250/0.2530	0.1630/0.3250	359	292	388	51.5	3900
AX1-TL05-U30	300 sm	150 sm	0.1000/0.2060	0.1310/0.2650	406	331	449	56.8	4795
AX1-TL05-U40	400 sm	185 sm	0.0778/0.1640	0.1025/0.2120	461	379	526	62.8	6100
AX1-TL05-U50	500 sm	240 sm	0.0605/0.1250	0.0810/0.1630	527	441	615	70.1	6545

The above data is approximate and subjected to manufacturing tolerance.

Multicore Cables, with Stranded Copper Conductors, XLPE Insulated, Steel Wire Armoured and LSHF Sheathed

Description

- Multicore cables of stranded Copper conductors are insulated with XLPE compound,cores are assembled together, extruded LSHF bedding armoured with steel wires and covered with an overall jacket of LSHF compound.
- Cables are produced according to IEC 60502-1 or BS 6724

Application

For outdoor installations in damp wet locations where mechanical damages are expected to occur.

Product - code	Nominal cross sectional area	Max. conductor resistance		Current rating			Approx. overall diameter	Approx. weight
		DC at 20 °C	AC at 90 °C	Laid direct in ground	Laid in ducts	Laid in free air		
	mm^2	Ω/km	Ω/km	A	A	A	mm	kg/km
Two core cables								
CX1-TL02-W08	4 rm	4.6100	5.8800	51	41	47	16.6	580
CX1-TL02-W09	6 rm	3.0800	3.9300	64	53	61	17.6	660
CX1-TL02-W10	10 rm	1.8300	2.3300	83	70	80	19.6	835
CX1-TL02-W11	16 rm	1.1500	1.4700	107	84	106	21.6	1020
CX1-TL02-W12	25 rm	0.7270	0.9270	140	108	140	24.2	1335
CX1-TL02-W13	35 rm	0.5240	0.6690	168	135	168	27.5	1755
Three core cables								
CX1-TL03-W08	4 rm	4.6100	5.8800	46	37	42	17.2	650
CX1-TL03-W09	6 rm	3.0800	3.9300	58	46	51	18.3	755
CX1-TL03-W10	10 rm	1.8300	2.3300	76	61	69	20.5	965
CX1-TL03-W11	16 rm	1.1500	1.4700	98	76	90	22.6	1240
CX1-TL03-W12	25 rm	0.7270	0.9270	130	103	120	27.0	1850
CX1-TL03-W13	35 rm	0.5240	0.6690	158	122	147	29.4	2220
Four core cables								
CX1-TL04-W08	4 rm	4.6100	5.8800	46	37	42	18.3	740
CX1-TL04-W09	6 rm	3.0800	3.9300	58	46	51	19.5	860
CX1-TL04-W10	10 rm	1.8300	2.3300	76	61	69	21.9	1155
CX1-TL04-W11	16 rm	1.1500	1.4700	98	76	90	25.0	1630
CX1-TL04-W12	25 rm	0.7270	0.9270	130	103	122	29.1	2220
CX1-TL04-W13	35 rm	0.5240	0.6690	158	122	147	29.4	2520
CX1-TL04-W14	50 sm	0.3870	0.4940	185	145	184	33.1	3200
CX1-TL04-W15	70 sm	0.2680	0.3430	220	180	220	39.2	4645
CX1-TL04-W16	95 sm	0.1930	0.2480	265	210	273	42.9	5870
CX1-TL04-W17	120 sm	0.1530	0.1970	305	245	315	48.4	7555
CX1-TL04-W18	150 sm	0.1240	0.1600	335	275	375	53.1	8985
CX1-TL04-W19	185 sm	0.0991	0.1290	375	310	410	57.9	10760
CX1-TL04-W20	240 sm	0.0754	0.0990	435	365	488	64.1	13480
CX1-TL04-W30	300 sm	0.0601	0.0810	490	405	562	69.7	16215
CX1-TL04-W40	400 sm	0.0470	0.0642	547	459	634	76.8	20190
CX1-TL04-W50	500 sm	0.0366	0.0519	605	514	716	84.5	25375

The above data is approximate and subjected to manufacturing tolerance.

Product - code	Nominal cross sectional area		Max. conductor resistance		Current rating			Approx. overall diameter	Approx. weight
			DC at 20 °C	AC at 90 °C	Laid direct in ground	Laid in ducts	Laid in free air		
	mm^2		Ω/km	Ω/km	A	A	A	mm	kg/km
Four core cables with reduced neutral									
CX1-TL05-W13	35 rm	16 rm	0.5240/1.1500	0.6690/1.4700	158	122	147	27.7	2250
CX1-TL05-W14	50 sm	25 rm	0.3870/0.7270	0.4940/0.9270	185	145	184	31.3	2860
CX1-TL05-W15	70 sm	35 rm	0.2680/0.5240	0.3430/0.6690	220	180	220	37.5	4240
CX1-TL05-W16	95 sm	50 sm	0.1930/0.3870	0.2480/0.4940	265	210	273	41.2	5290
CX1-TL05-W17	120 sm	70 sm	0.1530/0.2680	0.1970/0.3430	305	245	315	45.3	6475
CX1-TL05-W18	150 sm	70 sm	0.1240/0.2680	0.1600/0.3430	335	275	375	50.5	8055
CX1-TL05-W19	185 sm	95 sm	0.0991/0.1930	0.1290/0.2480	375	310	410	55.4	9735
CX1-TL05-W20	240 sm	120 sm	0.0754/0.1530	0.0990/0.1970	435	365	488	60.3	11780
CX1-TL05-W30	300 sm	150 sm	0.0601/0.1240	0.0810/0.1600	490	405	562	66.4	14435
CX1-TL05-W40	400 sm	185 sm	0.0470/0.0991	0.0642/0.1290	547	459	634	72.7	18500
CX1-TL05-W50	500 sm	240 sm	0.0366/0.0754	0.0519/0.0990	605	514	716	80.2	27080

The above data is approximate and subjected to manufacturing tolerance.

rm : Round, Stranded
sm : Sector, Stranded

Multicore Cables, with Stranded, Aluminium Conductors, XLPE Insulated, Steel Wire Armoured and LSHF Sheathed

Description

- Multicore cables of stranded Aluminium conductors are insulated with XLPE compound, cores are assembled together extruded LSHF Bedding, armoured with steel wire and covered with an overall jacket of LSHF compound.
- Cables are produced according to IEC 60502-1 or BS 6724

Application

For outdoor installations in damp wet locations where mechanical damages are expected to occur.

Product - code	Nominal cross sectional area	Max. conductor resistance		Current rating			Approx. overall diameter	Approx. weight
		DC at 20 °C	AC at 90 °C	Laid direct in ground	Laid in ducts	Laid in free air		
	mm^2	Ω/km	Ω/km	A	A	A	mm	kg/km
Two core cables								
AX1-TL02-W10	10 rm	3.0800	3.9500	56	47	60	19.6	635
AX1-TL02-W11	16 rm	1.9100	2.4500	73	57	79	21.6	770
AX1-TL02-W12	25 rm	1.2000	1.5400	96	74	101	24.2	1370
AX1-TL02-W13	35 rm	0.8680	1.1130	129	105	131	27.5	1560
Three core cables								
AX1-TL03-W10	10 rm	3.0800	3.9500	52	41	52	20.5	715
AX1-TL03-W11	16 rm	1.9100	2.4500	67	52	67	22.6	870
AX1-TL03-W12	25 rm	1.2000	1.5400	89	70	89	27.0	1515
AX1-TL03-W13	35 rm	0.8680	1.1130	120	95	115	29.4	1770
Four core cables								
AX1-TL04-W10	10 rm	3.0800	3.9500	52	41	52	21.9	785
AX1-TL04-W11	16 rm	1.9100	2.4500	67	52	67	25.0	1335
AX1-TL04-W12	25 rm	1.2000	1.5400	89	70	89	29.1	1630
AX1-TL04-W13	35 rm	0.8680	1.1130	120	95	115	29.4	1700
AX1-TL04-W14	50 sm	0.6410	0.8220	145	110	141	33.1	2330
AX1-TL04-W15	70 sm	0.4430	0.5690	175	140	173	39.2	2760
AX1-TL04-W16	95 sm	0.3200	0.4110	210	165	210	42.9	3340
AX1-TL04-W17	120 sm	0.2520	0.3250	235	190	241	48.4	4320
AX1-TL04-W18	150 sm	0.2060	0.2650	265	215	283	53.1	5080
AX1-TL04-W19	185 sm	0.1640	0.2120	290	240	320	57.9	5990
AX1-TL04-W20	240 sm	0.1250	0.1630	340	280	383	64.1	7220
AX1-TL04-W30	300 sm	0.1000	0.1310	390	315	451	69.7	8440
AX1-TL04-W40	400 sm	0.0778	0.1025	444	373	513	76.8	10630
AX1-TL04-W50	500 sm	0.0605	0.0810	500	426	591	84.5	12785

The above data is approximate and subjected to manufacturing tolerance.

Product - code	Nominal cross sectional area		Max. conductor resistance		Current rating			Approx. overall diameter	Approx. weight
			DC at 20 °C	AC at 90 °C	Laid direct in ground	Laid in ducts	Laid in free air		
	mm^2		Ω/km	Ω/km	A	A	A	mm	kg/km
Four core cables with reduced neutral									
AX1-TL05-W13	35 rm	16 rm	0.8680/1.9100	1.1130/2.4500	120	95	115	27.7	1500
AX1-TL05-W14	50 sm	25 rm	0.6410/1.2000	0.8220/1.5400	145	110	141	31.3	1870
AX1-TL05-W15	70 sm	35 rm	0.4430/0.8680	0.5690/1.1130	175	140	173	37.5	2600
AX1-TL05-W16	95 sm	50 sm	0.3200/0.6410	0.4110/0.8220	210	165	210	41.2	3090
AX1-TL05-W17	120 sm	70 sm	0.2530/0.4430	0.3250/0.5690	235	190	241	45.3	3690
AX1-TL05-W18	150 sm	70 sm	0.2060/0.4430	0.2650/0.5690	265	215	283	50.5	4700
AX1-TL05-W19	185 sm	95 sm	0.1640/0.3200	0.2120/0.4110	290	240	320	55.4	5550
AX1-TL05-W20	240 sm	120 sm	0.1250/0.2530	0.1630/0.3250	340	280	383	60.3	6560
AX1-TL05-W30	300 sm	150 sm	0.1000/0.2060	0.1310/0.2650	390	315	451	66.4	7820
AX1-TL05-W40	400 sm	185 sm	0.0778/0.1640	0.1025/0.2120	444	373	513	72.7	9845
AX1-TL05-W50	500 sm	240 sm	0.0605/0.1250	0.0809/0.1630	500	426	591	80.2	11620

The above data is approximate and subjected to manufacturing tolerance.

rm : Round, Stranded
sm : Sector, Stranded

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TELECOM CABLES

www.dohacables.com

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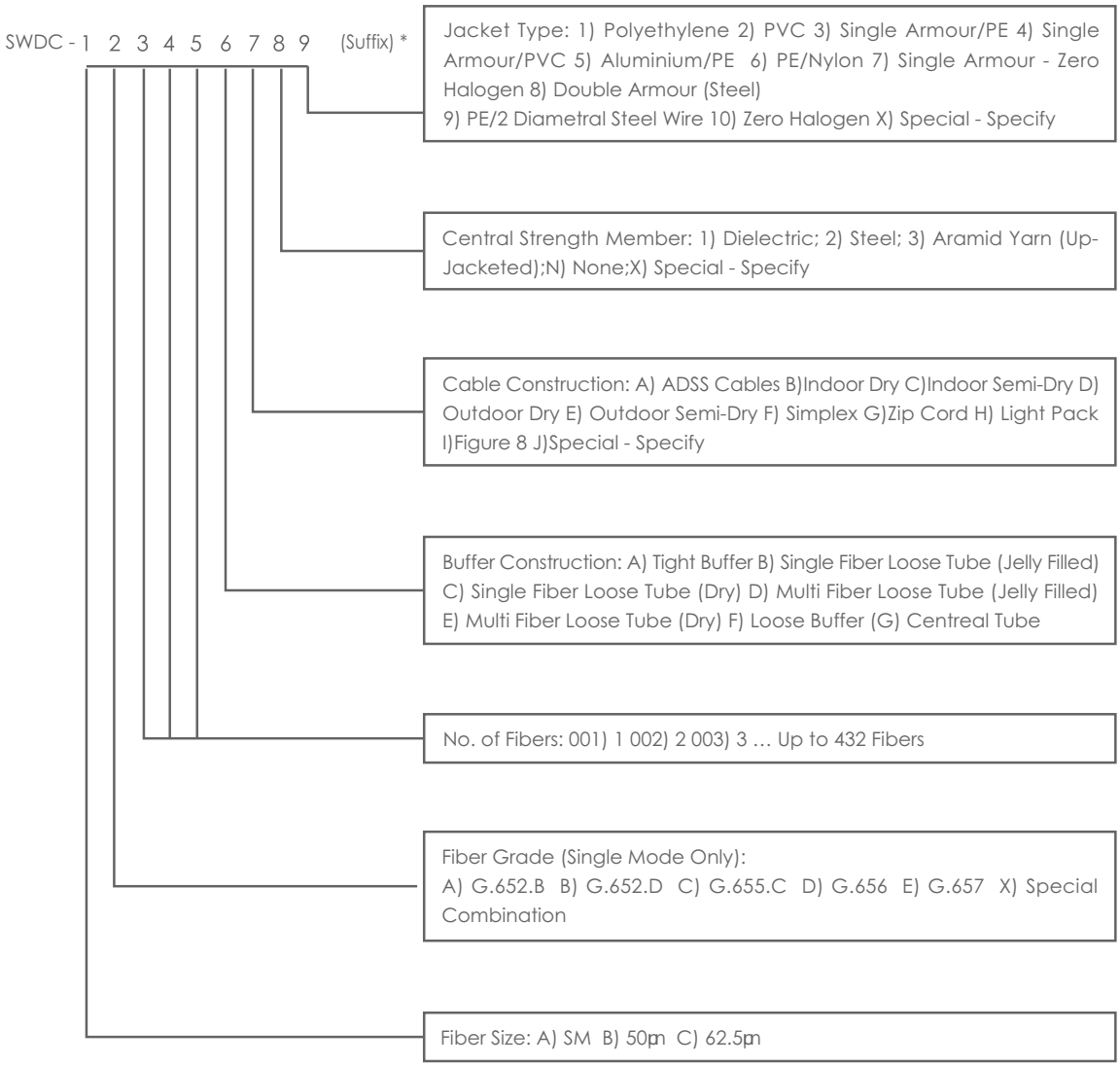
Fiber Optic Cables Ordering System

We strive to meet the technical requirements needed by our customers and this coding system is made to give us the chance to satisfy our customers optimally. The network/system engineers identify the needed fiber for their networks, no. of fibers, cable construction, and any other special specifications that will be specially customized for their needs. We find that we should provide our customers with a specifications selection guide based on a professional coding system with a simple flexible composition that assures an easy interpretation and cable selection. You can use this coding system to build your own cable with special specifications, otherwise;you can choose one of the cables presented in this catalogue with its ready made code

Fiber Optic Cables Coding System

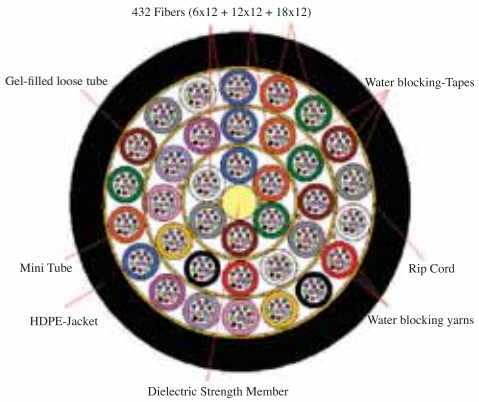


* Suffix: BK - Black Jacket, DWB - Dry Water Block Cable Core, DJ - Double Jacket
SWDC: Elsewedy Cables Group - Doha Cables Product
* You can add one of the above suffixes to add your special feature.

Duct Cable Semi Dry Core, Stranded Loose Tubes, All Dielectric

Features

- Duct Cable
- Pulled into duct systems
- Single-layer stranded construction (up to 432 fibers)
- Non-metallic construction.
- Particularly light, thin and robust cable
- PE- Sheath
- Lay in concrete channels



Product-Code	Number of fibers	Fibers per loose tube	Number of loose buffer tube	Number of stranding elements	Outer Diameter (mm)	Net Weight (kg/km)	Max Tensile Load During installation (N) short time
SWDC - AA012DC11	12	12	1	6	11.2	91	2700
SWDC - AA024DC11	24	12	2	6	11.2	91	2700
SWDC - AA036DC11	36	12	3	6	11.2	91	2700
SWDC - AA048DC11	48	12	4	6	11.2	91	2700
SWDC - AA060DC11	60	12	5	6	11.2	91	2700
SWDC - AA072DC11	72	12	6	6	11.2	91	2700
SWDC - AA096DC11	96	12	8	8	12.7	125	2700
SWDC - AA120DC11	120	12	10	10	14.3	155	2700
SWDC - AA144DC11	144	12	12	12	16.0	190	2700
SWDC - AA288DC11	288	12	24	24	19.5	250	2700
SWDC - AA432DC11	432	12	36	36	23.0	310	2700

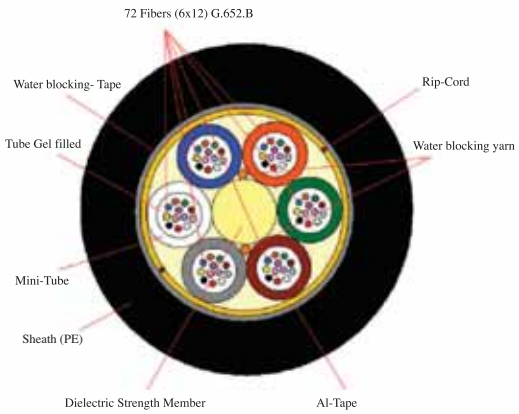
Specifications

Fibers Relevant Standards	ITU-T G. 652, G.655, G.656 or combination.
Cable Relevant Standards	IEC 60793 and IEC 60794.
Tube	Loose tube, filled.
Fibers and tube identifications	Containing enhanced single mode fibers in full compliance with ITU-T G.652 and/ or non-zero dispersion shifted single mode fibers in full compliance with ITU-T G.655 and ITU-T G.656.
Core	Stranded loose tube, SZ technique.
Wrapping	One, two or three layers of water blocking tape.
Tensile strength Elements	Dielectric central strength member or PE-coated dielectric central strength member.
Minimum Bending radius	20 x cable outer diameter (during laying and installation). 15 x cable outer diameter (installed)
Temperature Range	- 5 … +50 C (during laying and installation). - 40 … +70 C (during operation).
Delivery Length	As customer required.
Packing conditions	On non-returnable wooden drums.

Duct Cable Semi Dry Core, Stranded Losse Tubes, Moisture Barrier.

Features

- Duct Cable.
- Pulled into duct systems.
- Single-layer stranded construction (up to 432 fibers)
- Laminated AL-Tape
- Light, thin and robust cable.
- PE-Sheath.
- Lay in concrete channels.



Product-Code	Number of fibers	Fibers per loose tube	Number of loose buffer tube	Number of stranding elements	Outer Diameter (mm)	Net Weight (kg/km)	Max Tensile Load During installation (N) short time
SWDC - AA012DC15	12	12	1	6	12.2	115	2700
SWDC - AA024DC15	24	12	2	6	12.2	115	2700
SWDC - AA036DC15	36	12	3	6	12.2	115	2700
SWDC - AA048DC15	48	12	4	6	12.2	115	2700
SWDC - AA060DC15	60	12	5	6	12.2	115	2700
SWDC - AA072DC15	72	12	6	6	12.2	115	2700
SWDC - AA096DC15	96	12	8	8	13.7	150	2700
SWDC - AA120DC15	120	12	10	10	15.3	180	2700
SWDC - AA144DC15	144	12	12	12	17.0	220	2700
SWDC - AA288DC15	288	12	24	24	20.5	250	2700
SWDC - AA432DC15	432	12	36	36	24.0	350	2700

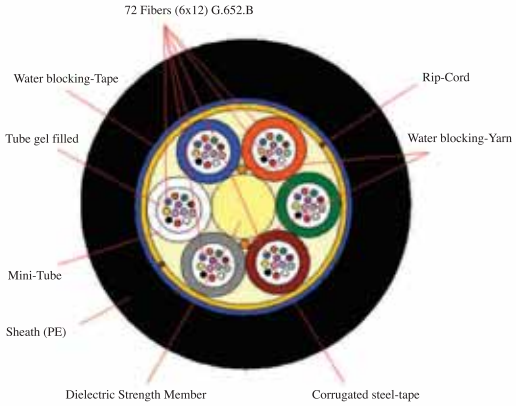
Specifications

Fibers Relevant Standards	ITU-T G.652, G.655, G.656 or combination.
Cable Relevant Standards	IEC 60793 and IEC 60794.
Tube	Loose tube, filled.
Fibers and tube identifications	Containing enhanced single mode fibers in full compliance with ITU-T G652 and /or non-zero dispersion shitted single mode fibers in full compliance with ITU-T G.655 and ITU-T G656.
Core	Stranded loose tube, SZ technique.
Wrapping	One, two or three layers of water blocking tape.
Moisture barrier	One layer of laminated aluminum tape.
Tensile strength Elements	Dielectric central strength member.
Minimum Bending radius	15 x cable outer diameter (during laying and installation). 12.5 x cable outer diameter (installed)
Temperature Range	- 5 … +50 C (during laying and installation). - 30 … + 70 C (during operation). - 40 … + 70 C (during transportation and storage).
Delivery Length	As customer required.
Packing conditions	On non-returnable wooden drums.

Direct Buried Stranded Loose Tube, Corrugated Steel Tape Armouring.

Features

- Direct buried.
- Used in application with high mechanical loads.
- Single-layer stranded construction (up to 432 fibers).
- Corrugated steel tape as protection against rodents and mechanical damage.
- Thin and robust cable.
- Dry core construction.
- PE-Sheath



Product-Code	Number of fibers	Fibers per loose tube	Number of loose buffer tube	Number of stranding elements	Outer Diameter (mm)	Net Weight (kg/km)	Max Tensile Load During installation (N) short time
SWDC – AA012DD13	12	12	1	6	12.3	145	2700
SWDC – AA024DD13	24	12	2	6	12.3	145	2700
SWDC – AA036DD13	36	12	3	6	12.3	145	2700
SWDC – AA048DD13	48	12	4	6	12.3	145	2700
SWDC – AA060DD13	60	12	5	6	12.3	145	2700
SWDC – AA072DD13	72	12	6	6	12.3	145	2700
SWDC – AA096DD13	96	12	8	8	13.8	180	2700
SWDC – AA120DD13	120	12	10	10	15.4	220	2700
SWDC – AA144DD13	144	12	12	12	17.1	260	2700
SWDC – AA288DD13	288	12	24	24	21.5	340	2700
SWDC – AA432DD13	432	12	36	36	26.0	400	2700

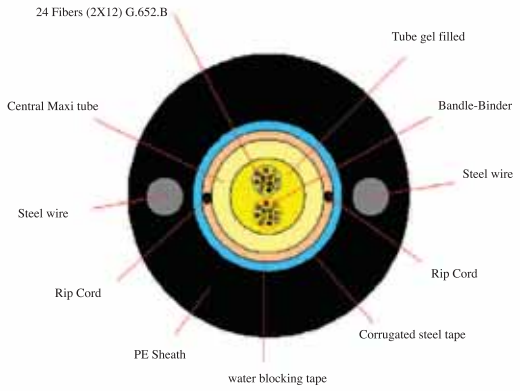
Specifications

Fibers Relevant Standards	ITU-T G. 652, G.655, G.656 or combination.
Cable Relevant Standards	IEC 60793 and IEC 60794.
Tube	Loose tube, filled.
Fibers and tube identifications	Containing enhanced single mode fibers in full compliance with ITU-T G652 and /or non-zero dispersion shitted single mode fibers in full compliance with ITU-T G.655 and ITU-T G656.
Core	Stranded loose tube, SZ technique.
Wrapping	One, two or three layers of water blocking tape.
Armouring	One layer of corrugated steel tape.
Outer Jacketing	Extruded PE, Black.
Minimum Bending Radius	20 x cable outer diameter (during laying and installation). 17.5 x cable outer diameter (installed)
Temperature Range	- 5 … +50 C (during laying and installation). -30 … +70 C (during operation). -40 … +70 C (during transportation and storage).
Delivery Length	As customer required.
Packing conditions	On non-returnable wooden drums.

Direct Buried Central Loose Tube, Corrugated Steel Tape Armouring, 2 Steel Wire Members

Features

- Direct buried.
- Used in application with high mechanical loads.
- Central tube construction (up to 48 fibers).
- Corrugated steel tape as protection agains rodents and mechanical damage.
- Thin and robust cable.
- PE-Sheath.



Product-Code	Number of fibers	Fibers per loose tube	Number of loose buffer tube	Number of stranding elements	Outer Diameter (mm)	Net Weight (kg/km)	Max Tensile Load During installation (N) short time
SWDC – AB004GHN9	04	04	1	4.2	12.1	156	2700
SWDC – AB008GHN9	08	08	1	4.2	12.1	156	2700
SWDC – AB012GHN9	12	12	1	4.2	12.1	156	2700
SWDC – AB016GHN9	16	08	2	4.2	12.1	156	2700
SWDC – AB020GHN9	20	10	2	4.2	12.1	156	2700
SWDC – AB024GHN9	24	12	2	4.2	12.1	156	2700
SWDC – AB036GHN9	36	12	3	6.0	13.9	198	2700
SWDC – AB048GHN9	48	12	4	6.0	13.9	198	2700

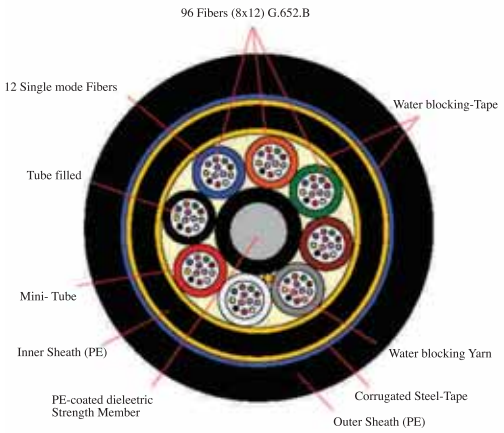
Specifications

Fibers Relevant Standards	ITU-T G.652, G.655, G.656 or combination.
Cable Relevant Standards	IEC 60793 and IEC 60794.
Tube	Loose tube, filled.
Fibers and tube identifications	Containing enhanced single mode fibers in full compliance with ITU-T G.652 and /or non-zero dispersion shitted single mode fibers in full compliance with
Core	ITU-T G.655 and ITU-T G656.
Wrapping	Central tube, filled.
Armouring	One layer of water blocking tape.
Outer Jacketing	One layer of corrugated steel tape.
Tensile strength Elements	Extruded PE, Black.
Minimum Bending radius	Two steel wires (1.5mm) integrated in PE jacket. 20 x cable outer diameter (during laying and installation).
Temperature Range	17.5 x cable outer diameter (installed) - 5 … +50 C (during laying and installation). -30 … +70 C (during operation). -40 … +70 C (during transportation and storage).
Delivery Length	As customer required.
Packing conditions	On non-returnable wooden drums.

Direct Buried Central Loose Tube, Corrugated Steel Tape Armouring, Double Jacket.

Features

- Direct buried.
- In application with particularly high mechanical loads.
- Single-layer stranded construction (up to 144 fibers).
- Corrugated steel tape as protection against rodents and mechanical damage.
- Particularly robust cable.
- PE-Sheath



Product-Code	Number of fibers	Fibers per loose tube	Number of loose buffer tube	Number of stranding elements	Outer Diameter (mm)	Net Weight (kg/km)	Max Tensile Load During installation (N) short time
SWDC - AC012DE1X	12	12	1	6	14.7	195	2700
SWDC - AC024DE1X	24	12	2	6	14.7	195	2700
SWDC - AC036DE1X	36	12	3	6	14.7	195	2700
SWDC - AC048DE1X	48	12	4	6	14.7	195	2700
SWDC - AC060DE1X	60	12	5	6	14.7	195	2700
SWDC - AC072DE1X	72	12	6	6	14.7	195	2700
SWDC - AC096DE1X	96	12	8	8	16.2	235	2700
SWDC - AC120DE1X	120	12	10	10	17.8	280	2700
SWDC - AC144DE1X	144	12	12	12	19.5	325	2700

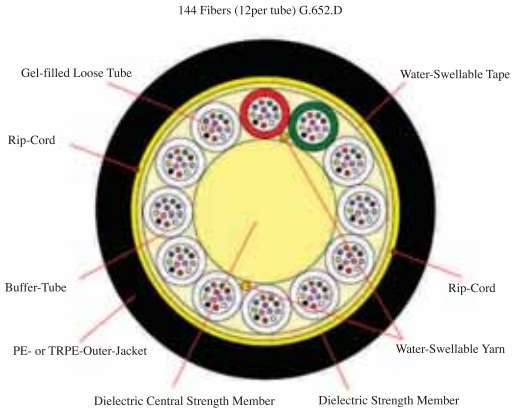
Specifications

Fibers Relevant Standards	ITU-T G.652, G.655, G.656 or combination.
Cable Relevant Standards	IEC 60793 and IEC 60794.
Tube	Loose tube, filled.
Fibers and tube identifications	Containing enhanced single mode fibers in full compliance with ITU-T G.652 and /or non-zero dispersion shitted single mode fibers in full compliance with ITU-T G.655 and ITU-T G656.
Core	Stranded loose tube, SZ technique.
Wrapping	Two layers of water blocking tape.
Armoring	One layer of corrugated steel tape.
Inner jacketing	Extruded PE, Black.
Outer Jacketing	Extruded PE, Black.
Tensile strength Elements	Dielectric central strength member.
Minimum Bending radius	20 x cable outer diameter (during laying and installation). 17.5 x cable outer diameter (installed)
Temperature Range	- 5 … +50 C (during laying and installation). -30 … +70 C (during operation). -40 … +70 C (during transportation and storage).
Delivery Length	As customer required.
Packing conditions	On non-returnable wooden drums.

All Dielectric Self Supporting (ADSS) Cables

Features

- Outdoor All Dielectric Self Supporting Cable up to 144 Fibers.
- Suitable for railway or telecommunication lines.
- Installation along wooden or concrete poles or lattice lowers.
- Resistant to severe environmental conditions.
- Minimized loads due to small diameter and low weight.
- All dielectric construction.
- PE-Sheath, also as TRPE-Sheath



Product-Code	Number of fibers	Fibers per loose tube	Number of loose buffer tube	Number of stranding elements	Outer Diameter (mm)	Net Weight (kg/km)	Max Tensile Load During installation (N) short time
SWDC – AA144DA11	144	12	12	12	18	270	8000

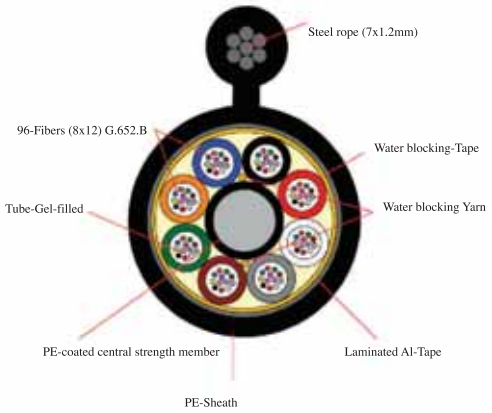
Specifications

Fibers Relevant Standards	ITU-T G.652, G.655, G.656 or combination.
Cable Relevant Standards	IEC 60793, ANSI/ICEA-S-87-640
Tube	Loose tube, filled.
Fibers and tube identifications	Containing enhanced single mode fibers in full compliance with ITU-T G.652 and /or non-zero dispersion shitted single mode fibers in full compliance with ITU-T G.655 and ITU-T G656.
Core	SZ-Stranded
Outer Jacketing	PE-Sheath, also as TRPE-Sheath
Tensile strength Elements	Dielectric central strength member (armed yarns)
Minimum Bending radius	20 x cable outer diameter (during laying and installation).
Temperature Range	- 5 … +50 C (during laying and installation).
	-30 … +70 C (during operation).
	-40 … +70 C (during transportation and storage).
Delivery Length	As customer required.
Packing conditions	On non-returnable wooden drums.

Figuer 8 Aerial Cable

Features

- Aerial installation along wooden or concrete poles or lattice lowers.
- Compatible with a wide range of lettings and hardware.
- Suitable for railway or telecommunication lines.
- Stranded loose tube dry core design.
- Proven design, restistant to severe environmental conditions.
- Not useable on high voltage power lines.
- PE-Sheath.



Product-Code	Number of fibers	Fibers per loose tube	Number of loose buffer tube	Number of stranding elements	Outer Diameter (mm)	Net Weight (kg/km)	Max Tensile Load During installation (N) short time
SWDC – AA012DI15	12	12	1	6	11.2 x 20.2	162	2000
SWDC – AA024DI15	24	12	2	6	11.2 x 20.2	162	2000
SWDC – AA036DI15	36	12	3	6	11.2 x 20.2	162	2000
SWDC – AA048DI15	48	12	4	6	11.2 x 20.2	162	2000
SWDC – AA060DI15	60	12	5	6	11.2 x 20.2	162	2000
SWDC – AA072DI15	72	12	6	6	11.2 x 20.2	162	2000
SWDC – AA096DI15	96	12	8	8	12.7 x 21.7	192	2000
SWDC – AA120DI15	120	12	10	10	14.3 x 23.3	225	2000
SWDC – AA144DI15	144	12	12	12	16.0 x 25.0	260	2000

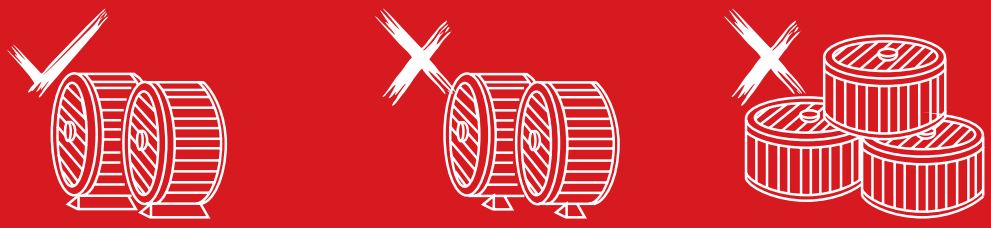
Specifications

Fibers Relevant Standards	ITU-T G.652, G.655, G.656 or combination.
Cable Relevant Standards	IEC 60793 and IEC 60794.
Tube	Loose tube, filled.
Fibers and tube identifications	Containing enhanced single mode fibers in full compliance with ITU-T G652.D and/ or non-zero dispersion shitted single mode fibers in full compliance with ITU-T G.655 and ITU-T G656.
Core	Stranded loose tube, SZ technique.
Outer Jacketing	Extruded PE, Black.
Tensile strength Elements	Dielectric central strength member and 7 x 1.2 mm stranded steel messenger wire.
Minimum Bending radius	30 x Cable outer diameter and 20 x Mandrel diameter during laying.
Temperature Range	- 5 … +50 C (during laying and installation). -30 … +70 C (during operation). -40 … +70 C (during transportation and storage).
Delivery Length	As customer required.
Packing conditions	On non-returnable wooden drums.

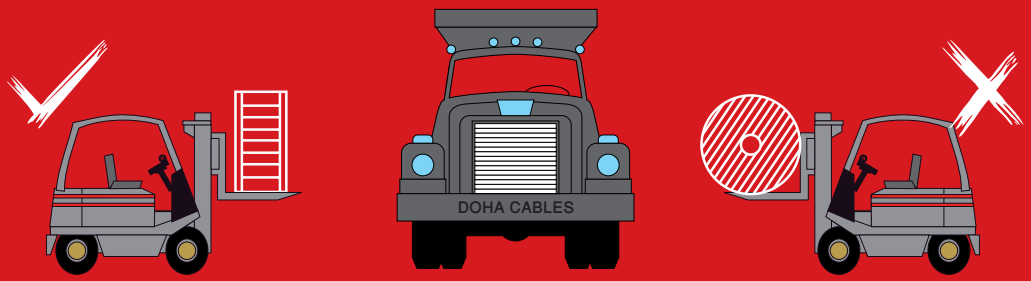
Handling Instructions

Cables should be installed and stored according to International regulation by trained persons with good engineering practice. Cable are supplied on heavy wooden/steel drum and handling these drums can constitute real hazardous. Indicated some of the common mistakes can be committed during the handling, care should be taken during loading and unloading.

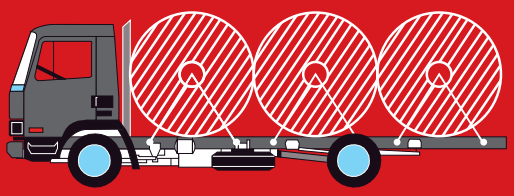
Lifting Cable Drums



Don't lay drums flat on their sides, use proper stops to prevent drums rolling



Lift Drums on Fork Trucks



Secure drums adequately before moving

Roll in the direction shown by the arrow

Laying of Power Cables

Applied Laying Depth

Type of Cable	Used Depth Cm
L.V	50 - 80
M.V	80 - 100
H.V	100 - 120
E.H.V	120 - 140

- Cable laying is a major factor affecting the cable life.
- Our Catalogue based on 50 cm for L.V & M.V and 130 cm for H.V & E.H.V

Laying Methods

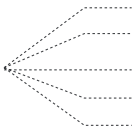
1- Paying out from a trailer

This method may apply only if there are no obstacles in the trench.

Care has to be taken that the cable drum is rotated by hand and braked if necessary, to prevent excessive tensile strength or kinking of the cable.

2- Laying by Hand

(Equipment needed)



(a) Cable Rollers [placed at distances 3 meters]
(b) Corner Rollers [placed at bends]
(c) Rollers for drawing cables in pipes
(d) Cable stocking (Grip)
(e) Brakes at the drum

The cable shall be pulled by men standing 4 to 6 m apart along the route.

The cable shall be supported on rollers during pulling. If kinking happens to the cable, the cable drum should be braked.

3- Laying by motor-driven Rollers

The cable is pulled off the jacked-up drum by motor driven rollers set up the trench 20 to 30m apart.

Normal rollers are distributed 3m apart between motor-driven rollers at sharp bends, it may be necessary to set up one motor driven rollers before and one after the bend.

All rollers are connected to the main switch box and switched on & off jointly.

With motor driven rollers the pull is evenly distributed over the whole length of the cable.

4- Pulling by Winch

The cable shall be equipped with a pulling eye or cable stocking the winch shall be equipped with.

(a) Dynamometer for continuous check of pulling force.
(b) Rupture device to interrupt the pulling if the maximum permissible pulling force is exceeded.
(c) Swivel at the pulling wire end to prevent twisting of cable during pulling.

5- Laying part of cables in a figure of eight (8) temporarily

The coils of figure eight shape must never be smaller than the minimum bending radius.

This radius should be noticed with much care during uncoiling the figure of eight.

Maximum Tensile Forces During Laying

- Maximum tensile force when pulling by cable stocking

$F = A \times 10$ ---------15 N

(cables with aluminium conductor)

$F = A \times 10$ --------- 20 N

(cables with copper conductor)

But the maximum value should be revised with us before laying of cables.

- Maximum tensile force when pulling by eye attached to the conductors

$F = A \times 30$ N

(cables with aluminium conductor)

$F = A \times 50$ N

(cables with copper conductor)

But the maximum value should be revised with us before laying of cables.

Where

A is Cable Cross Section mm^2

Earthing of Single Core H.V. and E.H.V. Cables

Distribution voltage cables are normally installed with solidly bonded sheaths and, in order to minimize the sheath circulating currents on single-core cables produced by the magnetic flux linking the conductors and sheaths, they are nearly always laid in close touching trefoil formation. However, trefoil formation is poor for heat dissipation, as the three cables have a considerable heating effect upon one another. This is generally not a limitation for cable system at 33 kV but with larger conductor sizes and higher voltages alternative "specially bonded" systems are more economic.

Special bonding involves earthing the single-core cable sheaths at one point only and insulating all other points of the sheath from earth, so that the circulating sheath losses are eliminated and the phase cables can design be spaced apart to reduce their mutual heating effect without increasing sheath losses.
If one termination only is grounded, the sheaths are subjected to a standing voltage of zero at the ground connection and maximum at the point furthest from this connection. This voltage is proportional to the conductor current and cable spacing. To protect the sheath insulation against transient voltages arising from lightning or switching transients it is therefore necessary to fit sheath voltage limiters (SVLs) at all joint and sealing end positions where the sheath is insulated from earth.

Three basic variations of specially bonded systems are commonly used: single end bonding, mid-point bonding and cross-bonding.

Specially Bonded Cable Systems

Single End Bonding System

In this system the sheaths at one termination are earthed and at the other termination are insulated from ground and fitted with SVLs. It is necessary to provide a separate earth continuity conductor for fault currents which would normally return via the cable sheaths. The standing voltage is proportional to the cable length and therefore the voltage limitation imposes a limitation on the length of the cable that may be bonded in this manner.

Mid-point Bonding System

Bonding of the mid-point is used where the route length is too long to employ a single end bonding system. In this system the cable is earthed at the mid-point (at joint) of the route and is insulated from ground and provided with SVLs at each termination or vice versa. It can be seen that this doubles the possible route length as the maximum allowable standing voltage can be tolerated at each sealing end or joint.

Cross-bonding System

In long routes, the route is split up into "major" sections, each comprised of three lengths and special joints are fitted. At each third joint position the sheaths are connected together and at all other positions they are connected so that all sheaths occupying the same position in the cable trench are connected in series .The sheaths at the intermediate positions are also connected to SVLs. The three sheaths connected in series are associated with conductors of different phases and when the cables are installed in trefoil formation their currents, and hence the sheath voltages, have equal magnitude but phase displacements of 120˚. The overall effect if that the resultant voltage and current in the three sheaths are zero. When cables are laid in flat formation the voltages induced in the sheaths of the outer cable are greater than induced on the sheath of the middle cable and the phasor sum is not zero. The cables are therefore transposed at every joint position and the cross-connections are made with a phase rotation opposite to that of transposition so that the sheaths are effectively straight connected.

Type Test Certificates

Management System & Product Approval Certificates Awarded to ELSEWEDY CABLES

System Certificate

SR	System	Certificate	Certification Body	Date of Award	Front PageTest Certificate
1	Quality Management System	ISO 9001-2000	BASEC	23/42007	ISO 9001-2000 Certificate
2	Environmental Management System	ISO 14001-2004	SGS	8/3/2006	ISO 14001-2004 Certificate
3	National Award for Excellence in Export		Industrial Modernization	2005	National Export Award 2005

Product Approval

	Product Description				Certification Body / Independent Lab	Date of Award	Standard / Specification	Front PageTest Certificate
	Type	Size mm^2	Volt	Construction				
1	Extra High Voltage	1x1000	230Kv	CU/XLPE/Lead Sheath/HDPE	KEMA - Netherland	7/3/2001	IEC 62067	Certificate
2		1x800	220/130kv	CU/XLPE/Lead/HDPE	Egyptian Electrical Authorty High Voltage Research Center	20/12/2003	IEC 62067	Certificate
3		1x2000	76/132 kV	CU/XLPE/CW/Lead/HDPE	KEMA - Netherland	14/12/2009	IEC 60840	Certificate
1	High Voltage Cables	1x1600	38/66kv	CU-XLPE-Copper Wire-Copper Tape-HDPE	Egyptian Electrical Authorty High Voltage Research Center	5/21/2005	IEC 60840	Certificate
2		1x500	132kv	CU/XLPE/Lead Sheath/HDPE	KEMA - Netherland	8/5/1999	IEC 60840	Certificate
3		1x400	38/66kv	CU/XLPE/Copper Sheath/HDPE	Egyptian Electrical Authorty High Voltage Research Center	19/10/1998	IEC 60840	Certificate
4		1x400	38/66kv	CU/XLPE/Lead Sheath/HDPE	Egyptian Electrical Authorty High Voltage Research Center	12/5/1998	IEC 60840	Certificate
5		1x400	38/66kv	CU-XLPE-Copper Wire-Copper Tape-HDPE	Egyptian Electrical Authorty High Voltage Research Center	1/10/2005	IEC 60840	Certificate
6		1x1200	130/230kv	CU/XLPE/Lead/HDPE	Egyptian Electrical Authorty High Voltage Research Center	4/29/2007	IEC 62067	Certificate
7		1X1200	130/230kv	CU/XLPE/LEAD/HDPE	Egyptian Electrical Authorty High Voltage Research Center	11/8/2007	IEC 62067	Certificate
1	Medium Voltage Cables	1x800	6,35/11	CU/XLPE/CW/LEAD/LS0H	Egyptian Electrical Authorty High Voltage Research Center	5/28/2006	IEC 60502-2	Certificate
2		1x400	18/30kv	AL/XLPE/PVC	Egyptian Electrical Authorty High Voltage Research Center	12/31/1997	IEC 60502 & 60230	Certificate
3		1x400	12/20kv	AL/XLPE/PVC	Egyptian Electrical Authorty High Voltage Research Center	3/23/1998	IEC 60502 & 60230	Certificate
4		1x300	19/33kv	AL/XLPE	KEMA - Netherland	7/7/2005	IEC 60502-2	Certificate
5		1X240	8.7/15kv	AL/XLPE	KEMA-Netherlands	2/13/2006	IEC 60502-2	Certificate
6		1x240	18/30kv	AL-XLPE-Copper Wire Screen PVC	Egyptian Electrical Authorty High Voltage Research Center	6/25/2005	IEC 60502-2	Certificate
7		1x185	8.7/15kv	CU/XLPE/Lead Sheath/PVC	Egyptian Electrical Authorty High Voltage Research Center	4/24/2001	IEC 60502-2	Certificate
8		1x185	6/10kv	AL/XLPE/Copper Sheath/PVC English	Egyptian Electrical Authorty High Voltage Research Center	9/28/2003	IEC 60502-2	Certificate
9		1x185	6/10kv	AL/XLPE/Copper Sheath/PVC French	Egyptian Electrical Authorty High Voltage Research Center	9/28/2003	IEC 60502-2	Certificate
10		1x120	18/30kv	AL/XLPE/Copper Sheath/PVC English	Egyptian Electrical Authorty High Voltage Research Center	8/31/2003	IEC 60502-2	Certificate
11		1x120	18/30kv	AL/XLPE/Copper Sheath/PVC French	Egyptian Electrical Authorty High Voltage Research Center	8/31/2003	IEC 60502-2	Certificate
12		1x120	18/30kv	AL/XLPE/Copper Sheath/PVC English	Egyptian Electrical Authorty High Voltage Research Center	9/1/2003	IEC 60502-2	Certificate
13		1x120	18/30kv	AL/XLPE/Copper Sheath/PVC French	Egyptian Electrical Authorty High Voltage Research Center	9/1/2003	IEC 60502-2	Certificate
14		3x240	19/33kv	CU/XLPE/SWA/PVC	KEMA - Netherland	1/27/2005	IEC 60502-2	Certificate
15		3x240	18/30kv	AL/XLPE/STA/PVC	Egyptian Electrical Authorty High Voltage Research Center	12/9/1997	IEC 60502-2	Certificate
16		3x240	12/20kv	AL/XLPE/STA/PVC	Egyptian Electrical Authorty High Voltage Research Center	12/9/1997	IEC 60502-2	Certificate
17		3x240	6.35/11kv	CU/XLPE/STA/PVC Flame Retardant	KEMA - Netherland	8/8/2003	IEC 60332-3-24	Certificate
18		3x150	18/30kv	AL/XLPE/STA/PVC	Egyptian Electrical Authorty High Voltage Research Center	12/31/1997	IEC 60502 & 60230	Certificate
19		3x150	6.35/11kv	CU/XLPE/SWA/PVC	Egyptian Electrical Authorty High Voltage Research Center	6/29/2004	BS-EN 50265 BS-EN 60811-3-1	Certificate
20		3x150	6.35/11kv	CU/XLPE/SWA/PVC	Egyptian Electrical Authorty High Voltage Research Center	6/8/2004	BS 6622	Certificate
21		3x300	8.7/15kv	AL/XLPE/STA/PVC	KEMA - Netherland	1/11/2007	IEC 60502-2	Certificate
22		1x500	18/30kv	CU/XLPE/PVC	KEMA - Netherland	3/12/2007	IEC60502	Certificate
23		1x500	18/30kv	CU/XLPE/PVC	KEMA - Netherland	4/13/2007	AEIC CS8(2006)	Certificate
24		1x500	19/33kv	AL/XLPE/HDPE	KEMA - Netherland	6/21/2007	IEC 60502-2	Certificate
25		3x240	18/30kv	CU/XLPE/STA/PVC	KEMA-Netherlands	7/23/2007	IEC60502-2	Certificate
26		3x240	18/30kv	CU/XLPE/STA/PVC	KEMA-Netherlands	7/26/2007	AEIC CS8(2006)	Certificate
27		1x400	19/33kv	CU/XLPE/AWA/PVC	KEMA-Netherlands	9/13/2007	IEC60502-2	Certificate
28		1X500	19/33kv	AL/XLPE/HDPE	KEMA-Netherlands	3/27/2008	IEC60502-2	Certificate
29		3x240	6.35/11kv	CU/XLPE/STA/PVC	KEMA-Netherlands	20/5/2003	IEC60502-2	Certificate
30		1X300	8.7/15KV	CU/XLPE/PVC	KEMA-Netherlands	13/5/2008	IEC60502-2	Certificate
31		1X500	19/33KV	CU/XLPE/MDPE	KEMA-Netherlands	13/5/2008	BS7870-4.10	Certificate
32		3X185	8.7/15KV	CU/XLPE/PVC	KEMA-Netherlands	13/5/2008	IEC60502-2	Certificate
33		3X150	3.6/6KV	CU/XLPE/PVC	KEMA-Netherlands	13/5/2008	IEC60502-2	Certificate
34		1X300	8.7/15KV	CU/XLPE/PVC	KEMA-Netherlands	13/5/2008	AEIC CS8-06(2006)	Certificate
35		3X185	8.7/15KV	CU/XLPE/PVC	KEMA-Netherlands	13/5/2008	AEIC CS8-06(2006)	Certificate
36		3X150	3.6/6KV	CU/XLPE/PVC	KEMA-Netherlands	13/5/2008	AEIC CS8-06 (2006)	Certificate

DOHA CABLES

Management System & Product Approval Certificates Awarded to ELSEWEDY CABLES

Product Approval

	Product Description				Certification Body/Indpendent Lab	Date of Award	Standard / Specification	Front PageTest Certificate
	Type	Size mm ^{2}	Volt	Construction				
1	Low Voltage Cables	1x630	0.6/1kv	AL/PVC/PVC	Egyptian Electrical Authority High Voltage Research Center	1/26/2005	IEC 60502-1	Certificate
2		1x70	0.6/1kv	AL/PVC	Egyptian Electrical Authority High Voltage Research Center	11/8/1997	IEC 60502 & 60228	Certificate
3		1x70	0.6/1kv	AL/XLPE +2.5% Carbon Black	Egyptian Electrical Authority High Voltage Research Center	8/13/2003	IEC 60502 & 60228	Certificate
4		1x16	0.6/1kv	AL/PVC	Egyptian Electrical Authority High Voltage Research Center	6/23/1998	IEC 60502 & 60228	Certificate
5		1x3 1x6 1x10 1x16	0.6/1kv 0.6/1kv 0.6/1kv 0.6/1kv	CU/PVC	Cairo University, Faculty of Engineering Energy Research Center	3/4/1998	IEC 60227	Certificate
6		3X240+120	0.6/1kv	CU/PVC/DSTA/PVC English	Egyptian Electrical Authority High Voltage Research Center	17/12/1997	IEC 60502 & 60228	Certificate
7		3X240+120	0.6/1kv	CU/PVC/DSTA/PVC Arabic	Egyptian Electrical Authority High Voltage Research Center	17/12/1997	IEC 60502 & 60228	Certificate
8		3X240+120	0.6/1kv	AL/PVC/STA/PVC English	Egyptian Electrical Authority High Voltage Research Center	15/11/1997	IEC 60502 & 60228	Certificate
9		3X240+120	0.6/1kv	AL/PVC/STA/PVC Arabic	Egyptian Electrical Authority High Voltage Research Center	15/11/1997	IEC 60502 & 60228	Certificate
10		3x185+95	0.6/1kv	AL/PVC/DSTA/PVC English	Egyptian Electrical Authority High Voltage Research Center	17/12/1997	IEC 60502 & 60228	Certificate
11		3x185+95	0.6/1kv	AL/PVC/DSTA/PVC Arabic	Egyptian Electrical Authority High Voltage Research Center	17/12/1997	IEC 60502 & 60228	Certificate
12		3X120+70	0.6/1kv	CU/PVC/DSTA/PVC	Egyptian Electrical Authority High Voltage Research Center	17/12/1997	IEC 60502 & 60228	Certificate
13		3X70+35	0.6/1kv	CU/XLPE/SWA/LSOH	Warington Fire Research Consultancy - Testing London	4/3/1997	IEC 60332	Certificate
14		3X70+35	0.6/1kv	AL/PVC/DSTA/PVC English	Egyptian Electrical Authority High Voltage Research Center	17/12/1997	IEC 60502 & 60228	Certificate
15		3X70+35	0.6/1kv	AL/PVC/DSTA/PVC Arabic	Egyptian Electrical Authority High Voltage Research Center	17/12/1997	IEC 60502 & 60228	Certificate
16		3X35	0.6/1kv	CU/XLPE/SWA/LSHF	KEMA-Netherlands	9/13/2006	BS EN50267-2-1&BS EN 50267-2-2&BS EN 61034-1&BS61034-2&BS EN 50266-2-4	Certificate
17		4X240	0.6/1kv	CU/XLPE/SWA/PVC Flame Retardant	KEMA-Netherlands	8/8/2003	IEC 60332-3-24	Certificate
18		4X240	0.6/1kv	CU/XLPE/SWA/PVC	KEMA-Netherlands	20/5/2003	IEC 60502-1	Certificate
19		4x16 4x25 4x95 4x150	0.6/1kv 0.6/1kv 0.6/1kv 0.6/1kv	CU/XLPE/SWA/PVC Flame&Heat Test	Egyptian Electrical Authority High Voltage Research Center	29/6/2004	BS-EN 50265 BS-EN 60811-3-1	Certificate
20		4x16 4x25 4x95 4x150	0.6/1kv 0.6/1kv 0.6/1kv 0.6/1kv	CU/XLPE/SWA/PVC	Egyptian Electrical Authority High Voltage Research Center	8/6/2004	BS 5467	Certificate
21		1x35 1x150	450/750V 450/750V	CU/PVC Flame&Heat Test	Egyptian Electrical Authority High Voltage Research Center	29/6/2004	BS-EN 50265 BS-EN 60811-3-1	Certificate
22		1x35 1x150	450/750V 450/750V	CU/PVC	Egyptian Electrical Authority High Voltage Research Center	6/8/2004	IEC 60227-2 & 60227-3	Certificate
23		1X1.5	450/750V	CU/PVC	Self Declaration	4/1/2006	HD 21.3 S3	Certificate
24		1X2.5	450/750V	CU/PVC	Self Declaration	4/1/2006	HD 21.3 S3	Certificate
25		1X6	450/750V	CU/PVC	Self Declaration	4/1/2006	HD 21.3 S3	Certificate
26		4X2.5	0.6/1kv	CU/XLPE/SWA/PVC	Self Declaration	4/1/2006	IEC 60502-1 IEC 60332-3 Cat.	Certificate
27		1X1	300/500V	CU/PVC	Self Declaration	30/4/2006	HD 21.3 S3	Certificate
28		1X25	450/750V	CU/PVC	Self Declaration	30/4/2006	HD 21.3 S3	Certificate
29		1X50	450/750V	CU/PVC	Self Declaration	30/4/2006	HD 21.3 S3	Certificate
30		1X95	450/750V	CU/PVC	Self Declaration	30/4/2006	HD 21.3 S3	Certificate
31		1X185	450/750V	CU/PVC	Self Declaration	30/4/2006	HD 21.3 S3	Certificate
32		1X300	450/750V	CU/PVC	Self Declaration	30/4/2006	HD 21.3 S3	Certificate
33		4x300	0.6/1kv	AL/XLPE/PVC	KEMA - Netherland	1/11/2007	IEC 60502-1	Certificate
34		1x630	0.6/1kv	CU/XLPE/PVC	KEMA - Netherland	1/10/2007	IEC 60502-1	Certificate
35		4x300	0.6/1kv	CU/XLPE/SWA/LSHF	KEMA - Netherland	1/18/2007	BS 6724	Certificate
36		25sqmm to 400sqmm	0.6/1kv	CU/XLPE/SWA/PVC	BASEC	3/12/2008	BS 5467	Certificate
37		25sqmm to 400sqmm	0.6/1kv	CU/XLPE/SWA/LSOH	BASEC	3/17/2008	BS 6724	Certificate
38		1X50	450/750V	CU/PVC G/Y	VDE	3/7/2008	HD 21.3 S3	Certificate
39		1x10	450/750V	CU/PVC	Self Declaration	8/30/2006	BS 6004	Certificate
40		1x10	450/750V	CU/PVC (Gray)	Self Declaration	8/30/2006	BS 6004	Certificate
41		1x10	450/750V	CU/PVC (Blue)	Self Declaration	8/30/2006	BS 6004	Certificate
42		1x10	450/750V	CU/PVC (Brown)	Self Declaration	8/30/2006	BS 6004	Certificate
43		1x10	450/750V	CU/PVC (Black)	Self Declaration	8/30/2006	BS 6004	Certificate
44		1x16	450/750V	CU/PVC (G/Y)	Self Declaration	8/30/2006	BS 6004	Certificate

Type Test Certificates

Management System & Product Approval Certificates Awarded to ELSEWEDY CABLES

		Product Description				Certification Body/Indpendent Lab	Date of Award	Standard / Specification	Front PageTest Certificate
		Type	Size mm^2	Volt	Construction				
Product Approval	45	Low Voltage Cables	1x16	450/750V	CU/PVC (Gray)	Self Declaration	8/30/2006	BS 6004	Certificate
	46		1x16	450/750V	CU/PVC (Blue)	Self Declaration	8/30/2006	BS 6004	Certificate
	47		1x16	450/750V	CU/PVC (Brown)	Self Declaration	8/30/2006	BS 6004	Certificate
	48		1x16	450/750V	CU/PVC (Black)	Self Declaration	8/30/2006	BS 6004	Certificate
	49		4x35	0.6/1kv	CU/XLPE/SWA/PVC	Self Declaration	8/17/2006	BS 5467	Certificate
	50		4x150	0.6/1kv	CU/XLPE/SWA/PVC	Self Declaration	9/3/2006	BS 5467	Certificate
	51		2x16	0.6/1kv	CU/XLPE/SWA/PVC	Self Declaration	12/19/2006	BS 5467	Certificate
	52		3x16	0.6/1kv	CU/XLPE/SWA/PVC	Self Declaration	12/19/2006	BS 5467	Certificate
	53		4x240	0.6/1kv	CU/XLPE/SWA/PVC	Self Declaration	1/14/2007	BS 5467	Certificate
	54		1x1	450/750V	CU/PVC Brown	Egyptian Electrical Authority High Voltage Research Center	2/25/2007	BS 6004-2000 BS EN 50396-2005	Certificate
			1X1	450/750	CU/PVC Yellow		2/25/2007		
			1x2	450/750	CU/PVC Blue		2/25/2007		
			1x16	450/750	CU/PVC Black		2/25/2007		
			1x25	450/750V	CU/PVC Yellow/Red		2/25/2007		
			1x50	450/750V	CU/PVC Red		2/25/2007		
			1x95	450/750V	CU/PVC Red		2/25/2007		
			1x185	450/750V	CU/PVC Red		2/25/2007		
			1x300	450/750V	CU/PVC Yellow		2/25/2007		
	55		1x630	450/750v	CU/LSOH	BASEC	8/29/2007	BS7211	Certificate
	56		4x400	0.6/1kv	CU/XLPE/SWA/PVC	BASEC	8/29/2007	BS5467	Certificate
	57		25sqmm to 630sqmm	450/750v	CU/PVC	BASEC	8/29/2007	BS6004	Certificate
	58		2x4	0.6/1kv	CU/XLPE/SWA/PVC	Self Declaration	8/5/2007	BS5467	Certificate
	59		2x6	0.6/1kv	CU/XLPE/SWA/PVC	Self Declaration	8/5/2007	BS5467	Certificate
	60		2X25	0.6/1kv	CU/XLPE/SWA/PVC	Self Declaration	4/20/2008	BS5467	Certificate
	61		NYY	0.6/1kv	CU/PVC/PVC	VDE	9/27/2007	HD603 S1:1994/A2:2003	Certificate
	1	Over Head Transmission Line	1x400		AAAC	Egyptian Electrical Authority High Voltage Research Center	27/10/1997	IEC 60208	Certificate
			380-50		ACSR			IEC 60209	
	2		1x70		AAAC	Egyptian Electrical Authority High Voltage Research Center	2/11/1999	IEC 60208	Certificate
			1x150						
	3		4X35	600V	AL/XLPE+2.5%C.B	Alex. University, Faculty of Engineering Electrical Engineering Dept.	30/11/1998	IEC 60502 & 60540 & 60228	Certificate
	4		1x54.6+ 3x70+2x16	0.6/1kv	Aerial Bundle Cables	Egyptian Electrical Authority High Voltage Research Center	25/10/2004	NFC 33-209 IEC 60811	Certificate
	5		1X35	0.6/1kv	AL/PVC+2.5%CB	Egyptian Electrical Authority High Voltage Research Center	23/3/1998	IEC 60502 & 60228	Certificate
SASO Product Approval	1	OPGW Cable	79/33	||.	OPGW 79/33 14KA/1sec 48 fibers	KINECTRICS INERNATIONAL	3/21/2006	IEEE1138	Certificate
SASO	1	High Voltage Cables Medium Voltage Cables Low Voltage Cables				Intertek ETL SEMKO	7/11/2006	IEC 60228 & 60889 & 60104 & 61232 & 61089 & 60227-1 & 60227-3 & 60227-2 & 60227- 6 & 60227-5 & 60227-7 & 60227-4 & 60502-2 & 60502-1	Certificate
	2	H.V	1X1000	110KV	CU/XLPE/CUW/LAT/HDPE	Intertek ETL SEMKO	21/5/2008	IEC 60840	Certificate
			1X1200		CU/XLPE/CUW/LAT/HDPE				
EOS Product Approval	1	1- EOS Certificate (A) EOS Certificate (E) 2- Contract between EOS & EGYTECH Cables 3- Test Report for: 1mm2 25mm2 50mm2 95mm2 185mm2 300mm2				Ministry of Trade & Industry EOS	1/7/2007	ES 182/2005 IEC 60227 BS 6004 HD 21.3	Certificate Ar. Certificate En.
PAI Approval Product Approval	1	CU/XLPE/SWA/PVC L.V				Intertek International Limited	16/12/2007	BS5467-97-IEC60502-1	Certificate
		CU/XLPE/STA/PVC L.V					16/12/2007	IEC60502-1	
		CU/XLPE/PVC L.V					16/12/2007	IEC60502-1	
		CU/PVC Wires					16/12/2007	BS6004-IEC60227-3	
		CU/PVC/PVC					16/12/2007	IEC 60007-3	
BASEC Product Approval	1	Indoors Wires,Control and Low Voltage Cables Up to 1 Kv Medium Voltage cables Up to 36 Kv High Voltage Cable Up to 150 Kv Extra High Voltage Cables Up to 220 Kv Overhead Transimission Lines Up to 500 Kv Execution of Turn Key Projects for 220 Kv Cables Optical Ground Wires Including Installation				BASEC	5/9/2007	BA 2250:1996	BASEC SCHEME
PVC Samples Product Approval	1	PVC Sheath Sample				KEMA	16/5/2008	IEC 60502-2 (2005)	Certificate

* CD available containing all certificates

DOHA CABLES

Cables Clarification Sheet

Rated Voltage

☐ 450/750 V ☐ 0.6/1 kV ☐ 1.8/3 kV (1.9/3.3 kV) ☐ 3.6/6 kV (3.8/6.6kV)

☐ 6/10 kV (6.35/11 kV) ☐ 8.7/15 kV ☐ 12/20 kV (12.7/22kV) ☐ 18/30 kV (19/33 kV)

☐ 38/66 kV ☐ 76/132 kV ☐ 127/220 kV

Conductor
C.S.A = mm²

☐ Copper ☐ Solid ☐ Stranded ☐ Flexible ☐ Milliken

☐ Aluminium ☐ Solid ☐ Stranded

Insulation

☐ PVC ☐ PVC - F.R ☐ XLPE

Copper Screen
Short Circuit Current = kA

☐ Copper Wire ☐ Copper Tape ☐ Copper (Tape + Wire)

Metallic Sheath

☐ Lead ☐ Lead Alloy ☐ Aluminum

Armour

☐ Steel ☐ Tape ☐ Galvanized Tape ☐ Galvanized Wire

☐ Aluminum ☐ Tape ☐ Wire

Sheathing (Overall Jacket)

☐ PVC ☐ PVC - F.R ☐ HDPE ☐ LSHF

☐ LLDPE ☐ MDPE ☐ Other ....

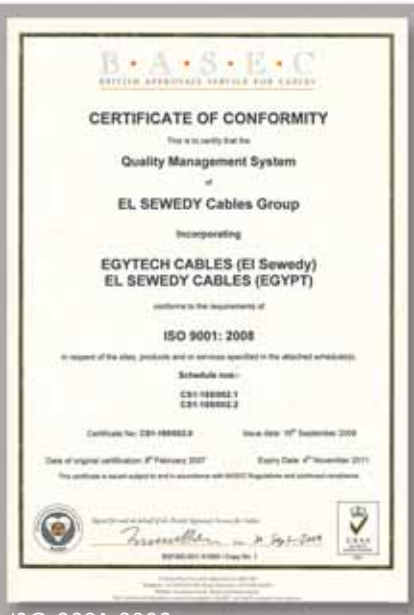
System's Certificates

National Export Award

ISO 14001:2004

BS OHSAS 18001:2007

ISO 9001:2008



ISO 9001:2008

Products' Certificates

NF Approval (H07V-K)

VDE Certificate for NYY Type

BASEC Certificate

BASEC Certificate

BASEC Certificate

Products' Certificates

KEMA Certificate for 1 x 1000 - 230 kV

KEMA Certificate for 1 x 2000 - 132 kV

KEMA Certificate for 1 x 500 - 33 kV

KEMA Certificate for 4 x 300 - 1 kV

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A subsidiary of **ELSEWEDY CABLES - AAMAL** joint venture