DEMİRER KABLO

High and Extra High Voltage Cable System

66 - 500 kV XLPE Cable

KAYO

Company Profile

Demirer Kablo is among the world's leading manufacturers in the the high and extra high voltage energy cables industry. Manufacturing telecommunication cables, signalling cables and cable accessories besides energy cables up to 500 kV and providing laying, jointing, terminating, testing, supervision and commissioning services, Demirer Kablo is a global turnkey project contractor.

Satisfying the growing demand of energy, in today's world, is one of the main prerequisities for industrial growth and thus rise in living standards. Demirer Kablo, with the cable systems it manufactured, creates value in the energy transmission area and contributes to satisfaction of this demand.

Demirer Kablo is committed to being the pioneering company of the world in its sector. Continuing its operations in this direction, Demirer Kablo puts human and environment to the first place along with customer satisfaction and carries out its research and development activities in order to manufacture energy cables providing more efficient, more reliable and more clean energy transmission. In every region we operate in the world, we take pride in contributing to local societies. Being aware of our responsibility towards human and environment, we always give priority to occupational health and safety and environmental consciousness, we preserve our high ethical values, we abide by applicable laws, rules and regulations and we respect local and national culltures.

We are aware that our success depends on the confidence of our customers in us and our ability to continously satisfy their changing and challenging needs. Alongside the products and services we provide with the highest quality and most competitive prices; always listening to them and providing them fast, creative and innovative solutions whenever they are in need, we are committed to satisfying our customers, exceeding their expectations.

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Demirer Kablo, working with most competent professionals, considers its highly skilled workforce as one of its most important values, and with continous training, ensures their adaptation to improving technology and changing conditions. Our diversity, responsibility, open communication, trust and kindness oriented culture guides all of our 277 employees and hundreds of business partners who are all experts in their field.

State of the art manufacturing facility of Demirer Kablo, having an outdoor area of 200.000 m2 and closed area of 40.000 m2, is founded in 1982. It consists of a cable factory and an accessories factory, manufacturing cables and accessories up to 500 kV. Three high technology CDCC lines and a test laboratory are in operation in the cable factory.

Demirer Kablo's annual production capacity can reach 40.000 tonnes of cables depending on the type of product. As of 01.01.2013, Demirer Kablo manufactured and delivered more than 7.400 kilometres of HV/EHV cables. Cable systems of Demirer Kablo are certified through type and prequalification Tests by KEMA, CESI, Georgia Power and similar international institutions.

In addition to the 400kV cable systems supplied for the local market, Demirer Kablo has completed High Voltage and Extra High Voltage projects in over 60 countries, from India to United States and from Saudi Arabia to Iceland with complete customer satisfaction.

Relying on our flexibility in the face of change, our farseeing strategy and the excellence of our products and services, we look to the future in complete confidence. We believe that our inspiration and excitement on creating value and ambition to serve our customers better at every occasion, will ensure our sustainable development.

Brief History

1982	Foundation of Demirer Kablo in Bozuyuk
1983	Start of production with 35kV medium voltage cable
1985	Acquisition of Demirer Kablo's majority shares by Saudi Cable Company (SCC)
1987	Acquisition of Kavel Kablo by SCC
1990	First high voltage cable production (69 kV)
1990	Start of fiberoptic cables production by Kavel Kablo
1993	Start of 154 kV high voltage cables production
1994	Raise of SCC share in Demirer Kablo to 100%
1994	Installation of 2nd CDCC line
1995	Start of 220 kV extra high voltage cables production
1996	Acquisition of ISO 9001 certificate
1997	Relocation of Kavel Kablo factory near to Demirer Kablo factory in Bozuyuk
2002	Reach of total produced HV cable length to 3000 km
2003	Start of 380 kV high voltage cables development
2003	Acquisition of ISO 14001 Environmental Management System Certificate
2005	Merger of Demirer Kablo and Kavel Kablo under Demirer Kablo (Kavel remains as the brand name for telecommunication cables)
2006	Acquisition of OHSAS 18001 Certificate
2007	First 380 kV turnkey project award by TEİAŞ in Turkey
2008	Installation of 3rd CDCC line
2009	Completion and energization of first 380 kV project
2009	Completion of 380 kV long term prequalification test with success
2009	Reach of total produced HV/EHV cable length to 7000 km
2011	Finalization of sixth 380 kV turnkey project

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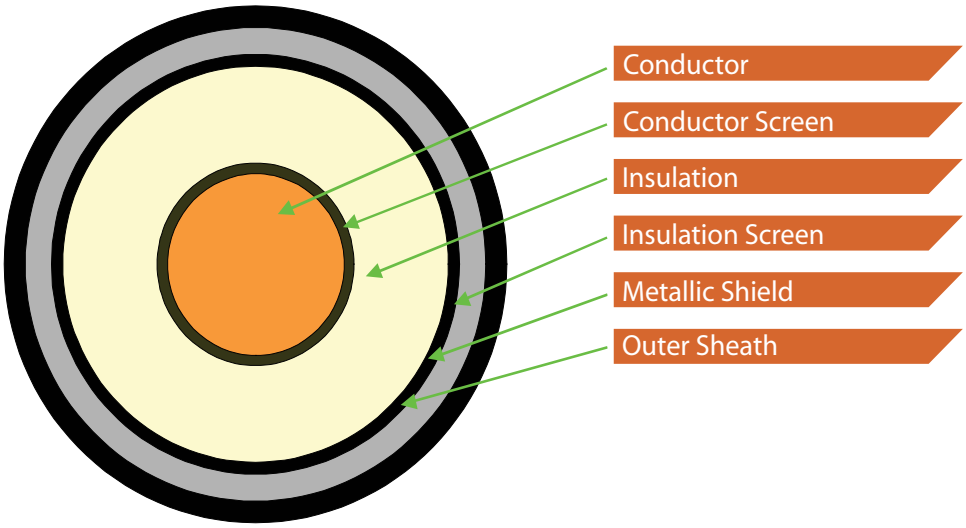
1.00 Design & Construction of XLPE Cable



Components	Classification	
Conductor	Material	Copper Aluminium
	Shape	Compacted Circular Milliken
Insulation	XLPE	
Metallic Shield	Copper wire screen incorporated with copolymer coated Al or Cu tapes Lead alloy sheath supported with copper wire screen Lead alloy sheath	
Outer Sheath	PVC PE Halogen free, fire retardant	

Rated Voltage	Conductor size
60 - 550 (kV)	185 - 3,000 mm^2

Typical conductor constructions:

Circular stranded compacted conductors up to 1,600 mm^2
Milliken conductors up to 3,000 mm^2 with 5 or 6 segments
Round solid aluminium conductors and Milliken copper conductors with enameled wires are available.

Conductor:

The cable consists of stranded compacted copper or aluminum conductor. Milliken conductors are used above 1,000 mm^2 to reduce skin effect. The individual segments are insulated from each other. Semi conductive tape may be applied over conductor. Longitudinal watertight design is provided depending on environmental conditions.

Conductor screen, Insulation, Insulation screen*:

All three layers are simultaneously applied by a triple extrusion process, using supersmooth, super clean HV/EHV grade raw materials with immediate curing on the CDCC (Completely Dry Curing and Cooling) line. High quality handling system is used.

** Average insulation thicknesses are defined in the tables; lower thicknesses for insulation may be offered.*

Metallic shields:

Copper wire screen incorporated with copolymer coated Al or Cu tapes:

Copolymer coated metallic tapes are applied over the copper wire screen to provide radial watertightness. Metallic tape is bonded to the polyethylene outer sheath to provide excellent mechanical properties. Screen area is made longitudinally watertight by means of water swellable tapes. Geometrical cross section area of copper screen is choosen to suit the short circuit requirements in each individual application. Subject types have low weight design.

Lead alloy sheath supported with copper wire screen:

Radial watertightness is provided by extruded lead sheath.
The copper wire screen is placed under lead sheath. Screen area is in longitudinally watertight design by water swellable tapes. Short circuit current is shared proportionally by the copper wire screen and lead sheath. Lead sheath provides excellent corrosion resistance.

Lead alloy sheath:

Radial watertightness is provided by extruded lead sheath. Longitudinal watertightness is achieved by using water swellable tapes applied under lead sheath. Lead sheath carries the short circuit current. Lead sheath provides excellent corrosion resistance.

All above types of metallic sheaths can be designed to carry extra high short circuit currents.

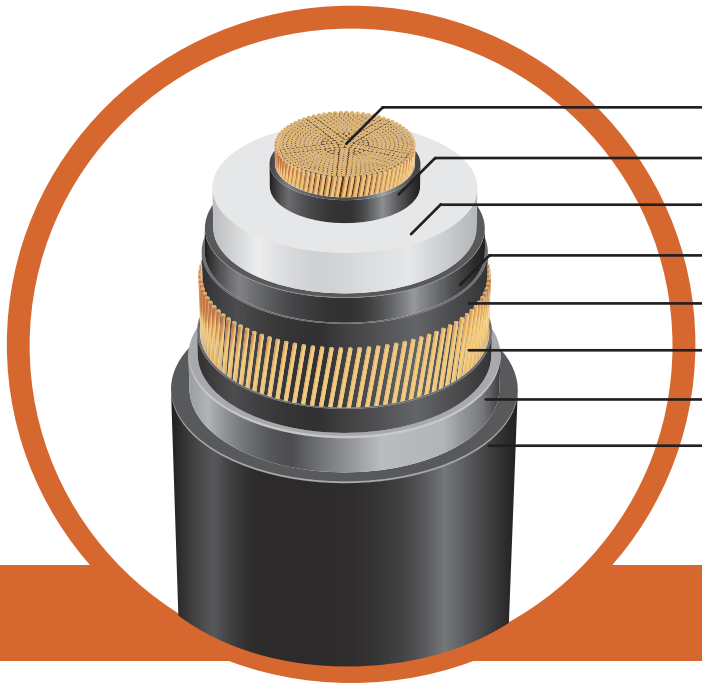
Optical fibre:

Above metallic shields can be optionally equipped with optical fibers in tubes for temperature monitoring.

Outer sheath:

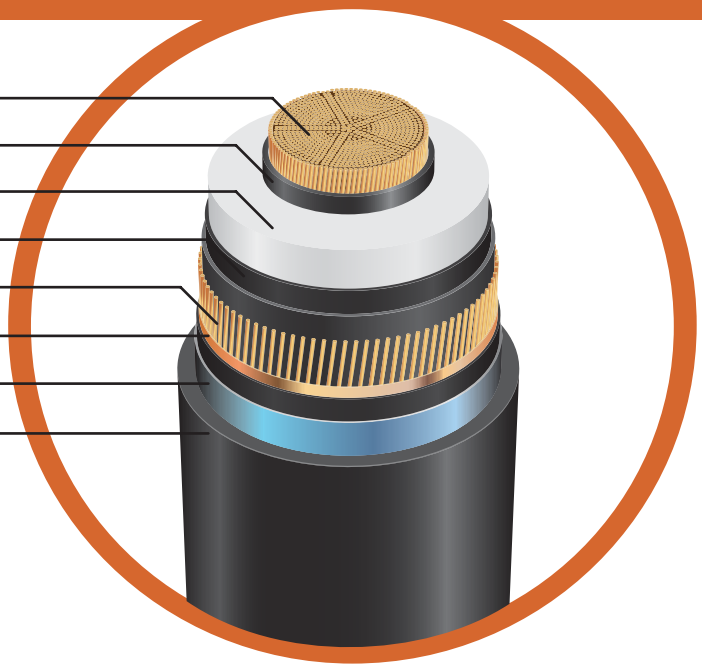
HDPE sheath is used in most cases which guarantees excellent mechanical and electrical strength. PE sheaths are halogen free. Flame retardant paint can be applied on site to limit the fire spread in building and tunnel applications. PVC sheaths are used with different formulas optimized for the purposes. PVC sheaths are also used when higher fire performance is required. Halogen free and fire retardant sheaths are used when higher fire performance is required in building and tunnel applications. In order to facilitate the testing of the outer sheath, a conductive layer is applied over it.

XLPE Insulated with Cu Wire + Lead Sheath



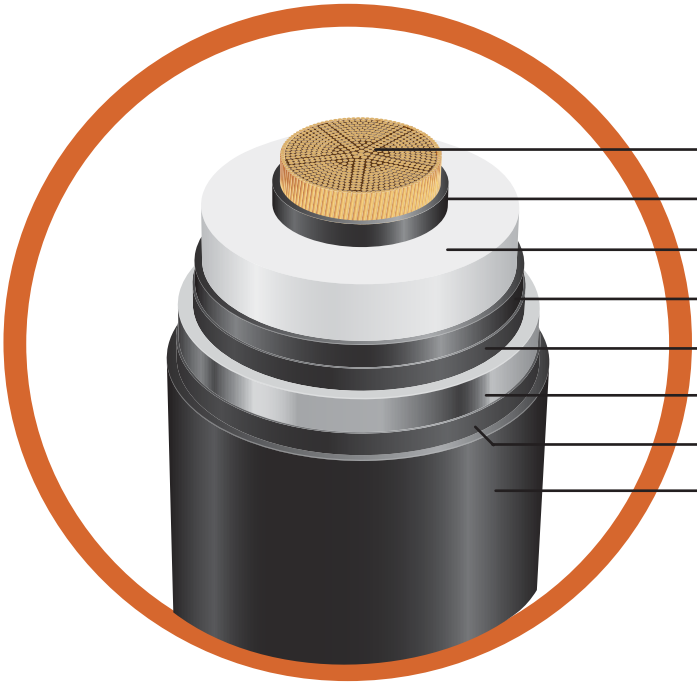
- Conductor
- Conductor Screen
- XLPE Insulation
- Insulation Screen
- Semiconducting Tape
- Copper Wire Screen
- Lead Sheath
- PE or PVC Outer Sheath

XLPE Insulated with Cu Wire + Al Tape



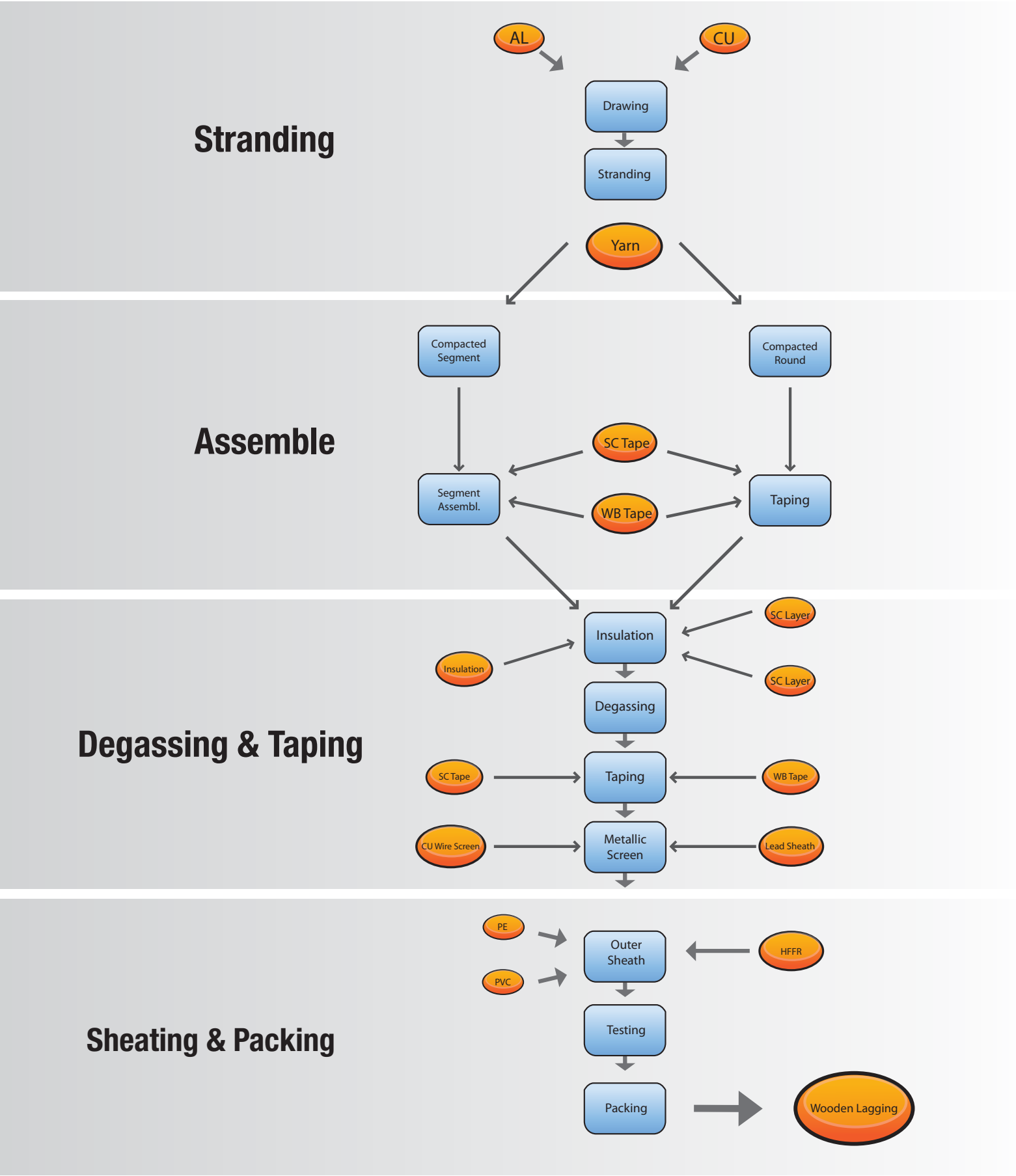
- Conductor
- Conductor Screen
- XLPE Insulation
- Semi Conducting Tape
- Copper Wire Screen
- Copper Tape
- Aluminum Laminated Tape
- PE or PVC Outer Sheath

XLPE Insulated with Lead Sheath



- Conductor
- Conductor Screen
- XLPE Insulation
- Insulation Screen
- Semi Conducting Tape
- Lead Sheath
- Tape
- PE or PVC Outer Sheath

1.10 Manufacturing Process

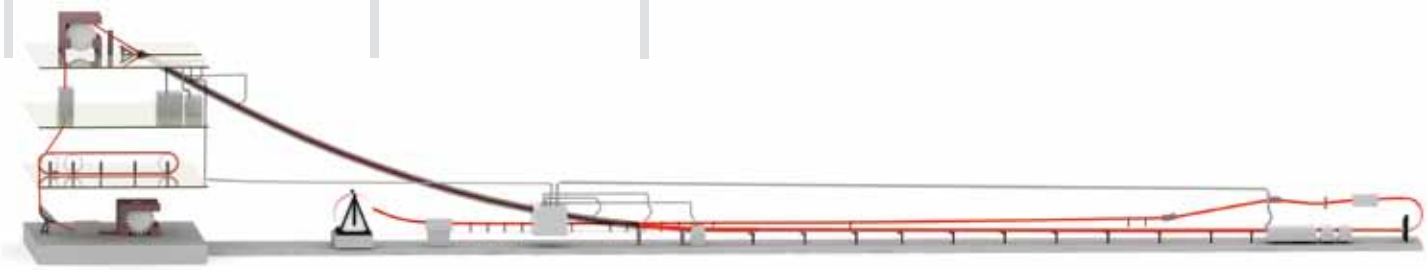


CCV Production Line

Extrusion
Compounds coming from clean room are extruded by triple extrusion

Curing Zone
Compounds are cured by heating under pressurized Nitrogen gas.

Cooling Zone
Cured core is cooled down by circulating Nitrogen gas.



1.30 Cable Construction & Continuous Current Ratings

Laying Conditions

Current carrying capacities are based on following conditions:

a In air: 30 °C ambient temperature, load factor: 1.0
(Cables are assumed to be protected from direct solar radiation)

b In soil: 25 °C ambient temperature,
thermal resistivity of the soil: 1 K.m/W, load factor: 1.0
Depth of laying: 1500 mm.

c Arrangement of single core cables:

- Trefoil formation: 3 cables laid in touching triangular bundles
- Flat formation: 3 cables laid side by side,

"axial distance;" in soil: 3D , in air: 4D

D = Outer diameter of the cable

d Earthing of metal sheaths or screens; cross bonding or single point bonding

Correction Factors For Various Laying Conditions

Correction Factors For Various Ambient Air Temperature

Air Temperatures (°C)	20°C	25°C	30°C	35°C	40°C	45°C	50°C
Rating Factor	1,09	1,05	1	0,95	0,9	0,85	0,8

Correction Factors For Various Ground Temperature

Ground Temperatures (°C)	15°C	20°C	25°C	30°C	35°C	40°C	45°C
Rating Factor	1,08	1,04	1	0,96	0,92	0,87	0,82

Correction Factors For Various Soil Thermal Resistivities

Soil Thermal Resistivity (km/W)	0,7	1	1,2	1,5	2	2,5	3
Rating Factor	1,13	1	0,93	0,85	0,74	0,67	0,62

Correction Factors For Various Depths of Laying

Depth of Laying (mm)	750	1000	1250	1500	1750	2000	2500
Rating Factor	1,1	1,06	1,03	1	0,98	0,96	0,93

Technical Data

a) I_{thN}, Max. short-circuit current on the conductor during 1 s, kA

Initial Temperature: 90°C , Final Temperature: 250°C		
Cross Section (mm²)	Aluminium Conductor	Copper Conductor
240	22,6	34,3
300	28,2	42,9
400	37,6	57,2
500	47,0	71,5
630	59,2	90,1
800	75,2	114,4
1000	94,0	143,0
1200	112,8	171,6
1400	131,6	200,2
1600	150,4	228,8
2000	188,0	286,0
2500	235,0	357,5
3000	282,0	429,0
per mm²	0,094	0,143

* Short circuit current for various tripping times (T_k -sec), I_{th}

$$I_{th} = \frac{I_{thN}}{\sqrt{T_k}}$$

where,

I_{thN} = short-circuit current for 1 second (as per above table)

1.40 XLPE CABLE AND CABLE SYSTEM STANDARDS

DK's XLPE cable systems are designed to meet requirements of international and / or national standards. Commonly used standards for HV/EHV cables are as follows:

IEC
(International Electrotechnical Commission)

IEC 60228
Conductors of insulated cables

IEC 60287
Electric cables – Calculation of the current rating

IEC 60332
Tests on electric cables under fire conditions

IEC 60502
Power cables with extruded insulation and their accessories

IEC 60840
Power cables with extruded insulation and their accessories for rated voltage above 30 kV (Um=36 kV) up to 150 kV (Um=170 kV). Test methods and requirements

IEC 60853
Calculation of the cyclic and emergency current rating of cables

IEC 61443
Short – circuit temperature limits of electric cables with rated Voltages above 30 kV (Um = 36 kV)

IEC 60949
Calculation of thermally permissible short-circuit currents, taking into account non-adiabatic heating effects

IEC 62067
Power cables with extruded insulation and their accessories for rated voltage above 150 kV (Um=170 kV) up to 500 kV (Um=550 kV)
Test methods and requirements

CENELEC
(European Commitee for Electrotechnical Standardization)

HD 632
Power cables with extruded insulation and their accessories for rated voltage above 36 kV (Um=42 kV) up to 150 kV (Um=170 kV)

ICEA
(Insulated Cable Engineers Association,Inc.)

S-108-720
Standard for extruded insulated power cables rated above 46 kV through 345 kV

AEIC
(Association of Edison Illuminating Companies)

CS 9
Specification for extruded insulation power cables and their accessories rated above 46 kV through 345 kV AC

ISO
(International Organization for Standardization)

Our systems comply with the requirements of **ISO 9001** and **ISO 14001**

OHSAS
(Occupation Health and Safety Assessments Series)

Our systems comply with the requirements of **OHSAS 18001**

1.50 Formulas

Load Current (I)

For single phase ac systems

$$I = \frac{P}{U.\cos}\ (A)$$

For three-phase systems

$$I = \frac{P}{\sqrt{3}U.\cos}\ (A)$$

P = load to be transmitted in kW

U = operating voltage (phase to phase voltage) in kV

Cos = power factor of load

DC resistance at operating temperature, θoC (R)

$$R = R_{20}\ (1 + \alpha_{20}.\Delta\theta)\ \Omega / km$$

where,

R_{20} = dc resistance of conductor at 20°C Ω/km

α_{20} = temperature coefficient of the resistance at 20°C, 1/deg C

for copper : α_{20} = 0.00393 1/deg C

for aluminium : α_{20} = 0.00403 1/deg C

Δθ = temperature difference (θ-20)

Operating capacitance

$$C = \frac{5.56\ r}{\ln \frac{D}{d}} \times 10^{-2}\ \mu F / km$$

where,

εr = dielectric constant of insulation

D = diameter over insulation, mm

d = diameter of conductor including semiconductive layer, if any, mm

Capacitive reactance, X_c

$$X_c = \frac{10^6}{C}\ \Omega / km$$

Capacitance current

$$I_c = U_o.\omega.C.10^{-3}\ A / km$$

where,

ω = angular frequency, 1/s

Uo = voltage between conductor and earth, kV

C = operating capacitance, μF/km

Formulas

Earth leakage current

$$I_e = 3U_o.\omega.C.10^{-3} \quad A / km$$

Inductance per conductor

in trefoil formation,

$$L = 0.2\left(\frac{1}{4} + \ln\frac{a}{r}\right) mH / km$$

in flat formation,
mean inductance:

$$L_m = 0.2\left(\frac{1}{4} + \ln\frac{\sqrt[3]{2}\,a}{r}\right) mH / km$$

where,
a = axial spacing of conductors, mm
r = raidus of conductor, mm

Inductive reactance, X_L

$$X_L = \omega L.10^{-3} \quad \Omega / km$$

(L in mH / km)

Three-phase active power, P

$$P = \sqrt{3}.U.I.Cos \qquad kW$$

Three-phase apparent power, S

$$S = \sqrt{3}.U.I \qquad kVA$$

Formulas

Voltage drop

Three-phase current

$$\Delta U = \sqrt{3} . I . L . (R_W . \cos \quad + X_L . \sin \quad) . 10^{-3} \quad V$$

Percentage voltage drop:

$$\Delta u = \frac{\Delta U}{U} x 100 \quad \%$$

where,
U = operating voltage, kV
I = load current, A
Rw = effective resistance, Ω/km
X_L = inductive reactance, Ω/km
L = length of cable, m
φ = phase angle of load

Loses due to current (I^2 R Losses), V

Under uniform load:

$V=3.I^2.Rw.10^{-3}$ kW / km

where,
I = load current, A
Rw = effective resistance, Ω/km

Dielectric losses, V_d

$$V_d = 3 U_o^2 . \omega . C . \tan \delta . 10^{-3} \quad kW / km$$

where,
Uo = voltage between conductor and earth, kV
ω = angular frequency, 1/s (2πf)
C = operating capacitance, μF/km
tanδ = loss factor

Electric-field stress, E

Electric-field stress at radius x(mm), E_X

$$E_x = \frac{U_o}{x \ln \frac{R}{r}} \quad kV / mm$$

Maximum electric-field stress

$$E_{max} = \frac{U_o}{r \ln \frac{R}{r}} \quad kV / mm$$

where,
Uo = voltage between conductor and screen or metallic sheath, kV
R = radius over insulation, mm
r = radius of conductor including semi-conductive layers, if any, mm

Dynamic force between two conductors;

$$F_s = \frac{2 . 10^{-7} . I_s^2}{a} \quad kN / m$$

where,
a = Phase axis distance (mm)
I_S = $K . \sqrt{2} . I_{th}$

where in,
I_S = Impulse short-circuit current [kA]
K = surge factor (usually defined as 1.8)
I_{th} = Short-circuit current [kA]

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1.60 High and Extra High Voltage Cables

Voltage Level	Cable Type
38/66 (72,5) kV	XLPE INSULATED WITH Cu WIRE + Al TAPE
38/66 (72,5) kV	XLPE INSULATED WITH Cu WIRE + LEAD SHEATH
38/66 (72,5) kV	XLPE INSULATED WITH LEAD SHEATH
64/110 (123) kV	XLPE INSULATED WITH Cu WIRE + Al TAPE
64/110 (123) kV	XLPE INSULATED WITH Cu WIRE + LEAD SHEATH
64/110 (123) kV	XLPE INSULATED WITH LEAD SHEATH
76/132 (145) kV	XLPE INSULATED WITH Cu WIRE + Al TAPE
76/132 (145) kV	XLPE INSULATED WITH Cu WIRE + LEAD SHEATH
76/132 (145) kV	XLPE INSULATED WITH LEAD SHEATH
87/150 (170) kV	XLPE INSULATED WITH Cu WIRE + Al TAPE
87/150 (170) kV	XLPE INSULATED WITH Cu WIRE + LEAD SHEATH
87/150 (170) kV	XLPE INSULATED WITH LEAD SHEATH
127/220 (245) kV	XLPE INSULATED WITH Cu WIRE + Al TAPE
127/220 (245) kV	XLPE INSULATED WITH Cu WIRE + LEAD SHEATH
127/220 (245) kV	XLPE INSULATED WITH LEAD SHEATH
190/330 (362) kV	XLPE INSULATED WITH Cu WIRE + Al TAPE
190/330 (362) kV	XLPE INSULATED WITH Cu WIRE + LEAD SHEATH
190/330 (362) kV	XLPE INSULATED WITH LEAD SHEATH
220/380 (420) kV	XLPE INSULATED WITH Cu WIRE + Al TAPE
220/380 (420) kV	XLPE INSULATED WITH Cu WIRE + LEAD SHEATH
220/380 (420) kV	XLPE INSULATED WITH LEAD SHEATH
290/500 (550) kV	XLPE INSULATED WITH Cu WIRE + Al TAPE
290/500 (550) kV	XLPE INSULATED WITH Cu WIRE + LEAD SHEATH
290/500 (550) kV	XLPE INSULATED WITH LEAD SHEATH

38/66 (72,5) kV

XLPE Insulated with Cu Wire + Al Tape

Continuous Current Rating for Single Circuit (A)

COPPER CONDUCTOR

Cross-Sectional Area (mm^2)		240	300	400	500	630	800	1000	1200	1600	2000	2500
Direct-buried		545	617	706	805	920	1039	1157	1333	1488	1642	1799
Pipe		522	591	678	776	890	1009	1129	1304	1463	1622	1787
In Air	Trefoil	576	658	762	877	1012	1049	1292	1542	1741	1942	2149
	Flat (S=3D)	715	820	955	1108	1292	1483	1688	1974	2251	2536	2836

HDPE pipe diameter = 2D

ALUMINIUM CONDUCTOR

Cross-Sectional Area (mm^2)		240	300	400	500	630	800	1000	1200	1600	2000	2500
Direct-buried		424	481	554	635	728	830	937	1054	1210	1352	1494
Pipe		406	462	532	612	704	806	913	1031	1189	1335	1482
In Air	Trefoil	449	515	601	697	807	931	1060	1226	1432	1619	1815
	Flat (S=3D)	557	642	752	878	1023	1189	1364	1558	1834	2085	2353

HDPE pipe diameter = 2D

CONDUCTOR (Cu)	Cross-Sectional Area (mm²)	240	300	400	500	630	800	1000	1200	1600	2000	2500
	Shape	Circular	Circular	Circular	Circular	Circular	Circular	Circular	Milliken	Milliken	Milliken	Milliken
	Diameter (mm)	18	20,4	23,45	26,4	30,25	34	39	43,5	49,5	56	63,5
Thickness of Conductor Screen (mm)		1	1	1	1	1	1	1,4	1,4	1,5	1,6	1,6
Thickness of Insulation (mm)		11	11	11	10	10	10	10	10	10	10	10
Thickness of Insulation Screen (mm)		1	1	1	1	1	1	1	1	1	1	1
Cu-Screen Cross-Sectional Area (mm²)		35	50	50	50	50	50	50	70	70	70	95
Thickness of Outer Sheath (mm)		2,6	2,6	2,7	2,8	2,9	3	3,1	3,3	3,5	3,9	4,1
Outer Diameter of Cable (mm)		57	59	62	63	67	71	77	83	90	97	106
Weight of Cable (kg/m)		4,3	5,1	6	7	8,5	10,3	12,6	14,7	18,5	22,7	28,6
Max. DC Cu Conductor Resistance at 20°C (ohm/km)		0,0754	0,0601	0,047	0,0366	0,0283	0,0221	0,0176	0,0151	0,0113	0,009	0,0072
Capacitance (µF/km)		0,174	0,189	0,207	0,242	0,267	0,291	0,329	0,363	0,403	0,447	0,497
Inductance (mH/km)		0,414	0,397	0,381	0,360	0,446	0,334	0,323	0,315	0,305	0,297	0,290

CONDUCTOR (Al)	Cross-Sectional Area (mm²)	240	300	400	500	630	800	1000	1200	1600	2000	2500
	Shape	Circular	Circular	Circular	Circular	Circular	Circular	Circular	Milliken	Milliken	Milliken	Milliken
	Diameter (mm)	18,5	21,1	24,25	27,4	30,6	34,8	39	43,5	50,2	56,5	63,5
Max. DC Al Conductor Resistance at 20°C (ohm/km)		0,125	0,1	0,0778	0,0605	0,0469	0,0367	0,0291	0,0247	0,0186	0,0149	0,0127
Weight of Cable (kg/m)		2,9	3,3	3,8	4,1	4,6	5,4	6,3	7,4	9	10,6	12,9

38/66 (72,5) kV

XLPE Insulated with Cu Wire + Lead Sheath

Continuous Current Rating for Single Circuit (A)

COPPER CONDUCTOR

Cross-Sectional Area (mm^2)		240	300	400	500	630	800	1000	1200	1600	2000	2500
Direct-buried		551	624	714	814	932	1050	1170	1349	1504	1663	1820
Pipe		523	595	683	781	898	1016	1138	1316	1474	1640	1807
In Air	Trefoil	576	661	766	882	1020	1158	1305	1561	1765	1976	2185
	Flat (S=3D)	730	841	981	1138	1332	1530	1744	2039	2329	2639	2941

HDPE pipe diameter = 2D

ALUMINIUM CONDUCTOR

Cross-Sectional Area (mm^2)		240	300	400	500	630	800	1000	1200	1600	2000	2500
Direct-buried		428	487	560	643	737	840	947	1066	1225	1370	1513
Pipe		407	464	536	617	709	812	920	1040	1201	1349	1499
In Air	Trefoil	449	518	604	702	815	940	1072	1242	1454	1650	1848
	Flat (S=3D)	569	659	773	902	1055	1227	1409	1610	1896	2169	2440

HDPE pipe diameter = 2D

CONDUCTOR (Cu)	Cross-Sectional Area (mm^2)	240	300	400	500	630	800	1000	1200	1600	2000	2500
	Shape	Circular	Circular	Circular	Circular	Circular	Circular	Circular	Milliken	Milliken	Milliken	Milliken
	Diameter (mm)	18	20,4	23,45	26,4	30,25	34	39	43,5	49,5	56	63,5
Thickness of Conductor Screen (mm)		1	1	1	1	1	1	1,4	1,4	1,5	1,6	1,6
Thickness of Insulation (mm)		11	11	11	10	10	10	10	10	10	10	10
Thickness of Insulation Screen (mm)		1	1	1	1	1	1	1	1	1	1	1
Cu-Screen Cross-Sectional Area (mm^2)		35	50	50	50	50	50	50	70	70	70	95
Thickness of Lead Sheath (mm)		1,7	2	2	2	2	2,2	2,2	2,4	2,4	2,6	2,7
Thickness of Outer Sheath (mm)		2,7	2,8	2,9	2,9	3	3,1	3,3	3,4	3,6	4	4,3
Outer Diameter of Cable (mm)		60	63	66	67	71	76	82	88	94	102	111
Weight of Cable (kg/m)		7,6	9,2	10,3	11,3	13,1	15,7	18,4	21,5	25,9	31,4	38,4
Max. DC Cu Conductor Resistance at 20°C (ohm/km)		0,0754	0,0601	0,047	0,0366	0,0283	0,0221	0,0176	0,0151	0,0113	0,009	0,0072
Capacitance (µF/km)		0,174	0,189	0,207	0,242	0,267	0,291	0,329	0,363	0,403	0,447	0,497
Inductance (mH/km)		0,423	0,409	0,392	0,371	0,356	0,344	0,333	0,325	0,314	0,306	0,299

CONDUCTOR (Al)	Cross-Sectional Area (mm^2)	240	300	400	500	630	800	1000	1200	1600	2000	2500
	Shape	Circular	Circular	Circular	Circular	Circular	Circular	Circular	Milliken	Milliken	Milliken	Milliken
	Diameter (mm)	18,5	21,1	24,25	27,4	30,6	34,8	39	43,5	50,2	56,5	63,5
Max. DC Al Conductor Resistance at 20°C (ohm/km)		0,125	0,1	0,0778	0,0605	0,0469	0,0367	0,0291	0,0247	0,0186	0,0149	0,0127
Weight of Cable (kg/m)		6,2	7,4	8,1	8,5	9,2	10,8	12,1	14,3	16,8	19,2	22,7

38/66 (72,5) kV

XLPE Insulated with Lead Sheath

Continuous Current Rating for Single Circuit (A)

COPPER CONDUCTOR

Cross-Sectional Area (mm^2)		240	300	400	500	630	800	1000	1200	1600	2000	2500
Direct-buried		549	620	710	810	925	1044	1164	1347	1502	1660	1819
Pipe		519	588	675	774	888	1006	1129	1310	1433	1634	1803
In Air	Trefoil	568	648	752	867	1002	1139	1282	1550	1754	1963	2178
	Flat (S=3D)	725	830	969	1126	1316	1515	1727	2043	2335	2641	2973

HDPE pipe diameter = 2D

ALUMINIUM CONDUCTOR

Cross-Sectional Area (mm^2)		240	300	400	500	630	800	1000	1200	1600	2000	2500
Direct-buried		427	482	556	639	733	835	942	1065	1225	1367	1508
Pipe		403	459	530	611	702	805	913	1035	1199	1344	1492
In Air	Trefoil	442	508	594	691	801	926	1055	1235	1450	1641	1834
	Flat (S=3D)	563	650	763	893	1042	1215	1396	1614	1907	2171	2431

HDPE pipe diameter = 2D

CONDUCTOR (Cu)	Cross-Sectional Area (mm^2)	240	300	400	500	630	800	1000	1200	1600	2000	2500
	Shape	Circular	Circular	Circular	Circular	Circular	Circular	Circular	Milliken	Milliken	Milliken	Milliken
	Diameter (mm)	18	20,4	23,45	26,4	30,25	34	39	43,5	49,5	56	63,5
Thickness of Conductor Screen (mm)		1	1	1	1	1	1	1,4	1,4	1,5	1,6	1,6
Thickness of Insulation (mm)		11	11	11	10	10	10	10	10	10	10	10
Thickness of Insulation Screen (mm)		1	1	1	1	1	1	1	1	1	1	1
Thickness of Lead Sheath (mm)		2,1	2,1	2,2	2,2	2,3	2,4	2,6	2,7	2,8	3,2	3,4
Thickness of Outer Sheath (mm)		2,6	2,7	2,8	2,8	3	3,1	3,2	3,4	3,6	4	4,2
Outer Diameter of Cable (mm)		56	59	62	63	68	72	78	84	91	100	108
Weight of Cable (kg/m)		7,6	8,5	9,8	10,9	12,9	15,3	18,5	21,3	26,1	32,2	39,4
Max. DC Cu Conductor Resistance at 20°C (ohm/km)		0,0754	0,0601	0,047	0,0366	0,0283	0,0221	0,0176	0,0151	0,0113	0,009	0,0072
Capacitance (µF/km)		0,174	0,189	0,207	0,242	0,267	0,291	0,329	0,363	0,403	0,447	0,497
Inductance (mH/km)		0,416	0,396	0,38	0,359	0,346	0,335	0,325	0,317	0,307	0,301	0,294

CONDUCTOR (Al)	Cross-Sectional Area (mm^2)	240	300	400	500	630	800	1000	1200	1600	2000	2500
	Shape	Circular	Circular	Circular	Circular	Circular	Circular	Circular	Milliken	Milliken	Milliken	Milliken
	Diameter (mm)	18,5	21,1	24,25	27,4	30,6	34,8	39	43,5	50,2	56,5	63,5
Max. DC Al Conductor Resistance at 20°C (ohm/km)		0,125	0,1	0,0778	0,0605	0,0469	0,0367	0,0291	0,0247	0,0186	0,0149	0,0127
Weight of Cable (kg/m)		6,2	6,7	7,6	8	9,3	10,4	12,2	14	16,5	20	23,7

64/110 (123) kV

XLPE Insulated with Cu Wire + Al Tape

Continuous Current Rating for Single Circuit (A)

COPPER CONDUCTOR

Cross-Sectional Area (mm^2)		240	300	400	500	630	800	1000	1200	1600	2000	2500
Direct-buried		545	617	706	805	920	1039	1157	1333	1488	1642	1799
Pipe		522	591	678	776	890	1009	1129	1304	1463	1622	1787
In Air	Trefoil	576	658	762	877	1012	1149	1292	1542	1741	1942	2149
	Flat (S=3D)	715	820	955	1108	1292	1483	1688	1974	2251	2536	2836

HDPE pipe diameter = 2D

ALUMINIUM CONDUCTOR

Cross-Sectional Area (mm^2)		240	300	400	500	630	800	1000	1200	1600	2000	2500
Direct-buried		424	481	554	635	728	830	937	1054	1210	1352	1494
Pipe		406	462	532	612	704	806	913	1031	1189	1335	1482
In Air	Trefoil	449	515	601	697	807	931	1060	1226	1432	1619	1815
	Flat (S=3D)	557	642	752	878	1023	1189	1364	1558	1834	2085	2353

HDPE pipe diameter = 2D

CONDUCTOR (Cu)	Cross-Sectional Area (mm^2)	240	300	400	500	630	800	1000	1200	1600	2000	2500
	Shape	Circular	Circular	Circular	Circular	Circular	Circular	Circular	Milliken	Milliken	Milliken	Milliken
	Diameter (mm)	18	20,4	23,45	26,4	30,25	34	39	43,5	49,5	56	63,5
Thickness of Conductor Screen (mm)		1	1	1	1	1	1	1,4	1,4	1,5	1,6	1,6
Thickness of Insulation (mm)		15	15	15	14	14	14	14	14	14	14	14
Thickness of Insulation Screen (mm)		1	1	1	1	1	1	1	1	1	1	1
Cross-Sectional Area (mm^2)		95	95	95	95	95	95	95	95	95	95	95
Thickness of Outer Sheath (mm)		2,8	2,9	3	3,1	3,2	3,4	3,5	3,6	3,8	4,2	4,5
Outer Diameter of Cable (mm)		65	67	71	72	76	80	86	92	98	106	114
Weight of Cable (kg/m)		5,6	6,3	7,2	8,2	9,7	11,6	14	16	19,9	24,2	30
Max. DC Cu Conductor Resistance at 20°C (ohm/km)		0,0754	0,0601	0,047	0,0366	0,0283	0,0221	0,0176	0,0151	0,0113	0,009	0,0072
Capacitance (µF/km)		0,141	0,152	0,165	0,188	0,206	0,224	0,251	0,275	0,304	0,336	0,372
Inductance (mH/km)		0,442	0,424	0,407	0,392	0,376	0,363	0,349	0,34	0,328	0,318	0,309

CONDUCTOR (Al)	Cross-Sectional Area (mm^2)	240	300	400	500	630	800	1000	1200	1600	2000	2500
	Shape	Circular	Circular	Circular	Circular	Circular	Circular	Circular	Milliken	Milliken	Milliken	Milliken
	Diameter (mm)	18,5	21,1	24,25	27,4	30,6	34,8	39	43,5	50,2	56,5	63,5
Max. DC Al Conductor Resistance at 20°C (ohm/km)		0,125	0,1	0,0778	0,0605	0,0469	0,0367	0,0291	0,0247	0,0186	0,0149	0,0127
Weight of Cable (kg/m)		4,1	4,5	5	5,3	5,9	6,7	7,4	8,7	10,4	12	14,3

64/110 (123) kV

XLPE Insulated with Cu Wire + Lead Sheath

Continuous Current Rating for Single Circuit (A)

COPPER CONDUCTOR

Cross-Sectional Area (mm^2)		240	300	400	500	630	800	1000	1200	1600	2000	2500
Direct-buried		547	620	710	810	925	1046	1164	1342	1497	1653	1812
Pipe		525	596	685	783	898	1018	1139	1317	1495	1638	1806
In Air	Trefoil	584	668	774	891	1028	1170	1315	1566	1767	1976	2186
	Flat (S=3D)	721	829	966	1120	1305	1499	1706	1994	2274	2563	2865

HDPE pipe diameter = 2D

ALUMINIUM CONDUCTOR

Cross-Sectional Area (mm^2)		240	300	400	500	630	800	1000	1200	1600	2000	2500
Direct-buried		427	484	557	639	732	836	942	1061	1218	1361	1505
Pipe		410	466	538	618	711	815	921	1041	1200	1347	1498
In Air	Trefoil	456	523	610	708	820	947	1077	1244	1454	1645	1843
	Flat (S=3D)	563	649	761	888	1033	1203	1378	1574	1851	2106	2376

HDPE pipe diameter = 2D

CONDUCTOR (Cu)	Cross-Sectional Area (mm^2)	240	300	400	500	630	800	1000	1200	1600	2000	2500
	Shape	Circular	Circular	Circular	Circular	Circular	Circular	Circular	Milliken	Milliken	Milliken	Milliken
	Diameter (mm)	18	20,4	23,45	26,4	30,25	34	39	43,5	49,5	56	63,5
Thickness of Conductor Screen (mm)		1	1	1	1	1	1	1,4	1,4	1,5	1,6	1,6
Thickness of Insulation (mm)		15	15	15	14	14	14	14	14	14	14	14
Thickness of Insulation Screen (mm)		1	1	1	1	1	1	1	1	1	1	1
Cu-Screen Cross-Sectional Area (mm^2)		95	95	95	95	95	95	95	95	95	95	95
Thickness of Lead Sheath (mm)		2	2	2,2	2,2	2,2	2,4	2,4	2,5	2,6	2,8	2,9
Thickness of Outer Sheath (mm)		3	3	3,2	3,2	3,3	3,5	3,6	3,7	3,9	4,3	4,6
Outer Diameter of Cable (mm)		69	71	75	76	80	85	91	96	103	111	120
Weight of Cable (kg/m)		10,1	10,9	12,5	13,6	15,5	18,2	21,1	23,8	28,7	34	41,3
Max. DC Cu Conductor Resistance at 20°C (ohm/km)		0,0754	0,0601	0,047	0,0366	0,0283	0,0221	0,0176	0,0151	0,0113	0,009	0,0072
Capacitance (µF/km)		0,141	0,152	0,165	0,188	0,206	0,224	0,251	0,275	0,304	0,336	0,372
Inductance (mH/km)		0,457	0,435	0,418	0,397	0,38	0,368	0,354	0,345	0,333	0,323	0,313

CONDUCTOR (Al)	Cross-Sectional Area (mm^2)	240	300	400	500	630	800	1000	1200	1600	2000	2500
	Shape	Circular	Circular	Circular	Circular	Circular	Circular	Circular	Milliken	Milliken	Milliken	Milliken
	Diameter (mm)	18,5	21,1	24,25	27,4	30,6	34,8	39	43,5	50,2	56	63,5
Max. DC Al Conductor Resistance at 20°C (ohm/km)		0,125	0,1	0,0778	0,0605	0,0469	0,0367	0,0291	0,0247	0,0186	0,0149	0,0127
Weight of Cable (kg/m)		8,6	9,2	10,4	10,8	11,6	13,4	14,7	16,6	19,2	21,8	25,6

64/110 (123) kV

XLPE Insulated with Lead Sheath

Continuous Current Rating for Single Circuit (A)

COPPER CONDUCTOR

Cross-Sectional Area (mm^2)		240	300	400	500	630	800	1000	1200	1600	2000	2500
Direct-buried		545	617	707	806	921	1041	1159	1342	1495	1654	1815
Pipe		522	592	680	778	892	1011	1133	1314	1471	1367	1807
In Air	Trefoil	576	659	764	880	1015	1155	1300	1560	1761	1971	2189
	Flat (S=3D)	715	822	958	1111	1295	1490	1695	2001	2282	2579	2903

HDPE pipe diameter = 2D

ALUMINIUM CONDUCTOR

Cross-Sectional Area (mm^2)		240	300	400	500	630	800	1000	1200	1600	2000	2500
Direct-buried		424	481	554	636	729	832	938	1060	1219	1362	1501
Pipe		406	462	533	614	705	808	916	1038	1200	1347	1491
In Air	Trefoil	450	516	602	700	810	936	1066	1240	1452	1643	1833
	Flat (S=3D)	558	643	754	881	1026	1194	1370	1580	1863	2120	2372

HDPE pipe diameter = 2D

CONDUCTOR (Cu)	Cross-Sectional Area (mm^2)	240	300	400	500	630	800	1000	1200	1600	2000	2500
	Shape	Circular	Circular	Circular	Circular	Circular	Circular	Circular	Milliken	Milliken	Milliken	Milliken
	Diameter (mm)	18	20,4	23,45	26,4	30,25	34	39	43,5	49,5	56	63,5
Thickness of Conductor Screen (mm)		1	1	1	1	1	1	1,4	1,4	1,5	1,6	1,6
Thickness of Insulation (mm)		15	15	15	14	14	14	14	14	14	14	14
Thickness of Insulation Screen (mm)		1	1	1	1	1	1	1	1	1	1	1
Thickness of Lead Sheath (mm)		2,3	2,4	2,5	2,5	2,6	2,7	2,8	2,9	3,1	3,4	3,5
Thickness of Outer Sheath (mm)		2,9	3	3,1	3,1	3,3	3,4	3,5	3,7	3,9	4,3	4,5
Outer Diameter of Cable (mm)		65	68	72	73	77	82	87	93	100	109	117
Weight of Cable (kg/m)		9,4	10,5	12	13	15,1	17,7	20,8	23,7	28,9	35	42,5
Max. DC Cu Conductor Resistance at 20°C (ohm/km)		0,0754	0,0601	0,047	0,0366	0,0283	0,0221	0,0176	0,0151	0,0113	0,009	0,0072
Capacitance (µF/km)		0,141	0,152	0,165	0,188	0,206	0,224	0,251	0,275	0,304	0,336	0,372
Inductance (mH/km)		0,446	0,426	0,408	0,387	0,372	0,361	0,347	0,338	0,327	0,318	0,31

CONDUCTOR (Al)	Cross-Sectional Area (mm^2)	240	300	400	500	630	800	1000	1200	1600	2000	2500
	Shape	Circular	Circular	Circular	Circular	Circular	Circular	Circular	Milliken	Milliken	Milliken	Milliken
	Diameter (mm)	18,5	21,1	24,25	27,4	30,6	34,8	39	43,5	50,2	56,5	63,5
Max. DC Al Conductor Resistance at 20°C (ohm/km)		0,125	0,1	0,0778	0,0605	0,0469	0,0367	0,0291	0,0247	0,0186	0,0149	0,0127
Weight of Cable (kg/m)		8	8,8	9,8	10,2	11,3	12,8	14,5	16,4	19,5	22,9	26,8

76/132 (145) kV

XLPE Insulated with Cu Wire + Al Tape

Continuous Current Rating for Single Circuit (A)

COPPER CONDUCTOR

Cross-Sectional Area (mm^2)		240	300	400	500	630	800	1000	1200	1600	2000	2500
Direct-buried		543	615	704	803	917	1035	1154	1331	1483	1639	1795
Pipe		522	592	679	776	890	1007	1128	1304	1460	1621	1785
In Air	Trefoil	578	662	763	879	1014	1152	1294	1542	1741	1942	2148
	Flat (S=3D)	708	814	951	1102	1284	1474	1677	1961	2236	2518	2815

HDPE pipe diameter = 2D

ALUMINIUM CONDUCTOR

Cross-Sectional Area (mm^2)		240	300	400	500	630	800	1000	1200	1600	2000	2500
Direct-buried		423	479	552	633	726	828	934	1052	1207	1349	1491
Pipe		407	462	532	612	704	806	912	1030	1188	1333	1481
In Air	Trefoil	452	518	602	699	809	933	1061	1225	1431	1618	1813
	Flat (S=3D)	553	637	748	873	1016	1182	1355	1548	1820	2070	2335

HDPE pipe diameter = 2D

CONDUCTOR (Cu)	Cross-Sectional Area (mm^2)	240	300	400	500	630	800	1000	1200	1600	2000	2500
	Shape	Circular	Circular	Circular	Circular	Circular	Circular	Circular	Milliken	Milliken	Milliken	Milliken
	Diameter (mm)	18	20,4	23,45	26,4	30,25	34	39	43,5	49,5	56	63,5
Thickness of Conductor Screen (mm)		1,2	1,2	1,2	1,2	1,2	1,2	1,4	1,4	1,5	1,6	1,6
Thickness of Insulation (mm)		17	17	16	16	16	16	16	16	16	16	16
Thickness of Insulation Screen (mm)		1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2
Cu-Screen Cross-Sectional Area (mm^2)		95	95	95	95	95	95	95	95	95	95	95
Thickness of Outer Sheath (mm)		3	3,1	3,1	3,2	3,3	3,4	3,6	3,7	3,9	1,3	4,6
Outer Diameter of Cable (mm)		70	73	74	77	81	85	91	96	103	111	120
Weight of Cable (kg/m)		6,1	6,8	7,6	8,8	10,3	12,2	14,6	16,8	20,5	24,9	30,8
Max. DC Cu Conductor Resistance at 20°C (ohm/km)		0,0754	0,0601	0,047	0,0366	0,0283	0,0221	0,0176	0,0151	0,0113	0,009	0,0072
Capacitance (µF/km)		0,132	0,141	0,16	0,172	0,188	0,204	0,226	0,248	0,273	0,301	0,334
Inductance (mH/km)		0,458	0,44	0,415	0,4	0,383	0,369	0,355	0,345	0,333	0,323	0,313

CONDUCTOR (Al)	Cross-Sectional Area (mm^2)	240	300	400	500	630	800	1000	1200	1600	2000	2500
	Shape	Circular	Circular	Circular	Circular	Circular	Circular	Circular	Milliken	Milliken	Milliken	Milliken
	Diameter (mm)	18,5	21,1	24,25	27,4	30,6	34,8	39	43,5	50,2	56,5	63,5
Max. DC Al Conductor Resistance at 20°C (ohm/km)		0,125	0,1	0,0778	0,0605	0,0469	0,0367	0,0291	0,0247	0,0186	0,0149	0,0127
Weight of Cable (kg/m)		4,7	5	5,3	5,9	6,4	7,3	8	9,3	11	12,7	15,1

76/132 (145) kV

XLPE Insulated with Cu Wire + Lead Sheath

Continuous Current Rating for Single Circuit (A)

COPPER CONDUCTOR

Cross-Sectional Area (mm^2)		240	300	400	500	630	800	1000	1200	1600	2000	2500
Direct-buried		545	618	708	808	924	1043	1163	1339	1494	1650	1807
Pipe		526	598	685	783	899	1018	1140	1315	1475	1636	1802
In Air	Trefoil	587	671	775	892	1031	1171	1317	1566	1769	1974	2185
	Flat (S=3D)	816	825	961	1113	1298	1490	1696	1981	2258	2543	2843

HDPE pipe diameter = 2D

ALUMINIUM CONDUCTOR

Cross-Sectional Area (mm^2)		240	300	400	500	630	800	1000	1200	1600	2000	2500
Direct-buried		425	482	556	637	731	834	941	1058	1215	1358	1501
Pipe		411	467	538	618	711	814	922	1039	1200	1346	1495
In Air	Trefoil	459	526	611	709	822	947	1078	1244	1453	1642	1841
	Flat (S=3D)	559	644	756	882	1027	1194	1370	1564	1838	2090	2358

HDPE pipe diameter = 2D

CONDUCTOR (Cu)	Cross-Sectional Area (mm^2)	240	300	400	500	630	800	1000	1200	1600	2000	2500
	Shape	Circular	Circular	Circular	Circular	Circular	Circular	Circular	Milliken	Milliken	Milliken	Milliken
	Diameter (mm)	18	20,4	23,45	26,4	30,25	34	39	43,5	49,5	56	63,5
Thickness of Conductor Screen (mm)		1,2	1,2	1,2	1,2	1,2	1,2	1,4	1,4	1,5	1,6	1,6
Thickness of Insulation (mm)		17	17	16	16	16	16	16	16	16	16	16
Thickness of Insulation Screen (mm)		1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2
Cu-Screen Cross-Sectional Area (mm^2)		95	95	95	95	95	95	95	95	95	95	95
Thickness of Lead Sheath (mm)		2,2	2,2	2,2	2,2	2,4	2,4	2,5	2,6	2,7	2,8	3
Thickness of Outer Sheath (mm)		3,1	3,2	3,2	3,3	3,5	3,6	3,7	3,9	4,1	4,5	4,8
Outer Diameter of Cable (mm)		74	77	78	81	86	90	96	101	108	116	125
Weight of Cable (kg/m)		11,3	12,3	13,1	14,5	17	19,2	22,3	25,4	30,1	35,6	43,1
Max. DC Cu Conductor Resistance at 20°C (ohm/km)		0,0754	0,0601	0,047	0,0366	0,0283	0,0221	0,0176	0,0151	0,0113	0,009	0,0072
Capacitance (µF/km)		0,132	0,141	0,16	0,172	0,188	0,204	0,226	0,248	0,273	0,301	0,334
Inductance (mH/km)		0,468	0,45	0,425	0,41	0,394	0,38	0,365	0,355	0,342	0,332	0,322

CONDUCTOR (Al)	Cross-Sectional Area (mm^2)	240	300	400	500	630	800	1000	1200	1600	2000	2500
	Shape	Circular	Circular	Circular	Circular	Circular	Circular	Circular	Milliken	Milliken	Milliken	Milliken
	Diameter (mm)	18,5	21,1	24,25	27,4	30,6	34,8	39	43,5	50,2	56,5	63,5
Max. DC Al Conductor Resistance at 20°C (ohm/km)		0,125	0,1	0,0778	0,0605	0,0469	0,0367	0,0291	0,0247	0,0186	0,0149	0,0127
Weight of Cable (kg/m)		10	10,6	10,9	11,7	13,1	14,4	15,8	17,9	20,7	23,3	27,4

76/132 (145) kV

XLPE Insulated with Lead Sheath

Continuous Current Rating for Single Circuit (A)

COPPER CONDUCTOR

Cross-Sectional Area (mm^2)		240	300	400	500	630	800	1000	1200	1600	2000	2500
Direct-buried		543	616	705	804	919	1037	1156	1338	1493	1650	1812
Pipe		523	594	680	778	892	1010	1131	1312	1471	1634	1805
In Air	Trefoil	580	663	765	882	1018	1158	1302	1559	1762	1970	2189
	Flat (S=3D)	711	816	953	1105	1288	1480	1685	1988	2268	2560	2881

HDPE pipe diameter = 2D

ALUMINIUM CONDUCTOR

Cross-Sectional Area (mm^2)		240	300	400	500	630	800	1000	1200	1600	2000	2500
Direct-buried		423	480	552	634	728	830	936	1057	1216	1358	1498
Pipe		407	463	533	614	706	808	914	1037	1199	1345	1490
In Air	Trefoil	452	519	603	701	812	937	1067	1240	1452	1641	1831
	Flat (S=3D)	554	639	750	876	1020	1187	1362	1570	1852	2105	2353

HDPE pipe diameter = 2D

CONDUCTOR (Cu)	Cross-Sectional Area (mm^2)	240	300	400	500	630	800	1000	1200	1600	2000	2500
	Shape	Circular	Circular	Circular	Circular	Circular	Circular	Circular	Milliken	Milliken	Milliken	Milliken
	Diameter (mm)	18	20,4	23,45	26,4	30,25	34	39	43,5	49,5	56	63,5
Thickness of Conductor Screen (mm)		1,2	1,2	1,2	1,2	1,2	1,2	1,4	1,4	1,5	1,6	1,6
Thickness of Insulation (mm)		17	17	16	16	16	16	16	16	16	16	16
Thickness of Insulation Screen (mm)		1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2
Thickness of Lead Sheath (mm)		2,4	2,5	2,5	2,6	2,7	2,8	2,9	3	3,2	3,5	3,8
Thickness of Outer Sheath (mm)		3,1	3,2	3,2	3,3	3,4	3,5	3,7	3,8	4	4,4	4,7
Outer Diameter of Cable (mm)		71	74	75	78	82	86	92	98	105	113	123
Weight of Cable (kg/m)		10,5	11,7	12,5	14,5	16,4	19	22,5	25,3	30,4	36,7	44,8
Max. DC Cu Conductor Resistance at 20°C (ohm/km)		0,0754	0,0601	0,047	0,0366	0,0283	0,0221	0,0176	0,0151	0,0113	0,009	0,0072
Capacitance (µF/km)		0,132	0,141	0,16	0,172	0,188	0,204	0,226	0,248	0,273	0,301	0,334
Inductance (mH/km)		0,459	0,441	0,416	0,402	0,385	0,372	0,358	0,348	0,336	0,327	0,318

CONDUCTOR (Al)	Cross-Sectional Area (mm^2)	240	300	400	500	630	800	1000	1200	1600	2000	2500
	Shape	Circular	Circular	Circular	Circular	Circular	Circular	Circular	Milliken	Milliken	Milliken	Milliken
	Diameter (mm)	18,5	21,1	24,25	27,4	30,6	34,8	39	43,5	50,2	56,5	63,5
Max. DC Al Conductor Resistance at 20°C (ohm/km)		0,125	0,1	0,0778	0,0605	0,0469	0,0367	0,0291	0,0247	0,0186	0,0149	0,0127
Weight of Cable (kg/m)		9,1	10	10,4	11,4	12,6	14,2	15,7	17,8	21	24,4	29,1

87/150 (170) kV

XLPE Insulated with Cu Wire + Al Tape

Continuous Current Rating for Single Circuit (A)

COPPER CONDUCTOR

Cross-Sectional Area (mm^2)		400	500	630	800	1000	1200	1600	2000	2500
Direct-buried		702	802	916	1035	1151	1327	1480	1635	1791
Pipe		681	778	892	1009	1128	1304	1460	1621	1784
In Air	Trefoil	768	882	1018	1156	1299	1543	1742	1943	2148
	Flat (S=3D)	942	1095	1274	1462	1663	1942	2214	2492	2784

HDPE pipe diameter = 2D

ALUMINIUM CONDUCTOR

Cross-Sectional Area (mm^2)		400	500	630	800	1000	1200	1600	2000	2500
Direct-buried		550	632	725	827	932	1049	1205	1346	1487
Pipe		535	614	705	807	912	1030	1189	1333	1480
In Air	Trefoil	605	701	811	935	1063	1226	1431	1617	1811
	Flat (S=3D)	741	867	1009	1172	1345	1534	1803	2048	2310

HDPE pipe diameter = 2D

CONDUCTOR (Cu)	Cross-Sectional Area (mm^2)	400	500	630	800	1000	1200	1600	2000	2500
	Shape	Circular	Circular	Circular	Circular	Circular	Milliken	Milliken	Milliken	Milliken
	Diameter (mm)	23,45	26,4	30,25	34	39	43,5	49,5	56	63,5
Thickness of Conductor Screen (mm)		1,2	1,2	1,2	1,2	1,4	1,4	1,5	1,6	1,6
Thickness of Insulation (mm)		18	18	18	18	18	18	18	18	18
Thickness of Insulation Screen (mm)		1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2
Cu-Screen Cross-Sectional Area (mm^2)		95	95	95	95	95	95	95	95	95
Thickness of Outer Sheath (mm)		3,3	3,3	3,4	3,6	3,7	3,7	4	4,4	4,7
Outer Diameter of Cable (mm)		78	81	85	90	95	101	107	114	124
Weight of Cable (kg/m)		8	9,2	10,8	12,7	15,1	17,4	21,2	25,6	31,6
Max. DC Cu Conductor Resistance at 20°C (ohm/km)		0,047	0,0366	0,0283	0,0221	0,0176	0,0151	0,0113	0,009	0,0072
Capacitance (µF/km)		0,148	0,159	0,173	0,187	0,207	0,226	0,249	0,274	0,304
Inductance (mH/km)		0,429	0,411	0,393	0,38	0,365	0,354	0,341	0,33	0,32

CONDUCTOR (Al)	Cross-Sectional Area (mm^2)	400	500	630	800	1000	1200	1600	2000	2500
	Shape	Circular	Circular	Circular	Circular	Circular	Milliken	Milliken	Milliken	Milliken
	Diameter (mm)	24,25	27,4	30,6	34,8	39	43,5	50,2	56,5	63,5
Max. DC Al Conductor Resistance at 20°C (ohm/km)		0,0778	0,0605	0,0469	0,0367	0,0291	0,0247	0,0186	0,0149	0,0127
Weight of Cable (kg/m)		5,8	6,3	6,9	7,8	8,6	9,9	11,6	13,4	15,9

87/150 (170) kV

XLPE Insulated with Cu Wire +Lead Sheath

Continuous Current Rating for Single Circuit (A)

COPPER CONDUCTOR

Cross-Sectional Area (mm^2)		400	500	630	800	1000	1200	1600	2000	2500
Direct-buried		706	807	922	1040	1159	1336	1491	1647	1804
Pipe		687	785	900	1018	1139	1316	1476	1637	1803
In Air	Trefoil	779	896	1033	1174	1320	1565	1769	1975	2185
	Flat (S=3D)	951	1105	1286	1476	1679	1960	2235	2516	2812

HDPE pipe diameter = 2D

ALUMINIUM CONDUCTOR

Cross-Sectional Area (mm^2)		400	500	630	800	1000	1200	1600	2000	2500
Direct-buried		554	636	729	832	938	1056	1213	1356	1498
Pipe		539	619	711	814	921	1040	1201	1347	1495
In Air	Trefoil	614	711	823	948	1079	1243	1452	1641	1839
	Flat (S=3D)	748	876	1018	1183	1356	1548	1818	2067	2332

HDPE pipe diameter = 2D

CONDUCTOR (Cu)	Cross-Sectional Area (mm²)	400	500	630	800	1000	1200	1600	2000	2500
	Shape	Circular	Circular	Circular	Circular	Circular	Milliken	Milliken	Milliken	Milliken
	Diameter (mm)	23,45	26,4	30,25	34	39	43,5	49,5	56	63,5
Thickness of Conductor Screen (mm)		1,2	1,2	1,2	1,2	1,4	1,4	1,5	1,6	1,6
Thickness of Insulation (mm)		18	18	18	18	18	18	18	18	18
Thickness of Insulation Screen (mm)		1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2
Cu-Screen Cross-Sectional Area (mm²)		95	95	95	95	95	95	95	95	95
Thickness of Lead Sheath (mm)		2,2	2,4	2,4	2,4	2,5	2,6	2,8	2,9	3,2
Thickness of Outer Sheath (mm)		3,4	3,5	3,6	3,7	3,9	4	4,2	4,6	4,9
Outer Diameter of Cable (mm)		82	86	90	94	100	106	113	120	130
Weight of Cable (kg/m)		13,9	15,9	17,8	20,1	23,3	26,4	31,5	37,1	45,1
Max. DC Cu Conductor Resistance at 20°C (ohm/km)		0,047	0,0366	0,0283	0,0221	0,0176	0,0151	0,0113	0,009	0,0072
Capacitance (µF/km)		0,148	0,159	0,173	0,187	0,207	0,226	0,249	0,274	0,304
Inductance (mH/km)		0,436	0,421	0,404	0,389	0,374	0,363	0,352	0,34	0,33

CONDUCTOR (Al)	Cross-Sectional Area (mm²)	400	500	630	800	1000	1200	1600	2000	2500
	Shape	Circular	Circular	Circular	Circular	Circular	Milliken	Milliken	Milliken	Milliken
	Diameter (mm)	24,25	27,4	30,6	34,8	39	43,5	50,2	56,5	63,5
Max. DC Al Conductor Resistance at 20°C (ohm/km)		0,0778	0,0605	0,0469	0,0367	0,0291	0,0247	0,0186	0,0149	0,0127
Weight of Cable (kg/m)		11,7	13,1	14	15,6	16,8	18,9	22,1	24,8	29,4

87/150 (170) kV

XLPE Insulated with Lead Sheath

Continuous Current Rating for Single Circuit (A)

COPPER CONDUCTOR

Cross-Sectional Area (mm^2)		400	500	630	800	1000	1200	1600	2000	2500
Direct-buried		703	802	918	1036	1155	1331	1486	1641	1798
Pipe		682	779	894	1012	1133	1309	1467	1629	1794
In Air	Trefoil	771	886	1023	1162	1307	1553	1755	1962	2171
	Flat (S=3D)	945	1098	1279	1468	1671	1952	2225	2508	2803

HDPE pipe diameter = 2D

ALUMINIUM CONDUCTOR

Cross-Sectional Area (mm^2)		400	500	630	800	1000	1200	1600	2000	2500
Direct-buried		551	633	726	828	934	1056	1208	1351	1495
Pipe		535	615	706	808	916	1034	1194	1340	1491
In Air	Trefoil	607	703	814	940	1069	1234	1441	1631	1829
	Flat (S=3D)	743	870	1012	1177	1349	1541	1810	2061	2326

HDPE pipe diameter = 2D

CONDUCTOR (Cu)	Cross-Sectional Area (mm²)	400	500	630	800	1000	1200	1600	2000	2500
	Shape	Circular	Circular	Circular	Circular	Circular	Milliken	Milliken	Milliken	Milliken
	Diameter (mm)	23,45	26,4	30,25	34	39	43,5	49,5	56	63,5
Thickness of Conductor Screen (mm)		1,2	1,2	1,2	1,2	1,4	1,4	1,5	1,6	1,6
Thickness of Insulation (mm)		18	18	18	18	18	18	18	18	18
Thickness of Insulation Screen (mm)		1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2
Thickness of Lead Sheath (mm)		2,6	2,7	2,8	2,9	3	3,2	3,3	3,7	3,9
Thickness of Outer Sheath (mm)		3,3	3,4	3,6	3,7	3,8	4	4,2	4,6	4,9
Outer Diameter of Cable (mm)		79	83	87	91	97	103	110	118	128
Weight of Cable (kg/m)		13,6	15,4	17,6	20,2	23,5	27	31,9	38,7	46,5
Max. DC Cu Conductor Resistance at 20°C (ohm/km)		0,047	0,0366	0,0283	0,0221	0,0176	0,0151	0,0113	0,009	0,0072
Capacitance (µF/km)		0,148	0,159	0,173	0,187	0,207	0,226	0,249	0,274	0,304
Inductance (mH/km)		0,428	0,413	0,396	0,382	0,368	0,358	0,345	0,336	0,326

CONDUCTOR (Al)	Cross-Sectional Area (mm²)	400	500	630	800	1000	1200	1600	2000	2500
	Shape	Circular	Circular	Circular	Circular	Circular	Milliken	Milliken	Milliken	Milliken
	Diameter (mm)	24,25	27,4	30,6	34,8	39	43,5	50,2	56,5	63,5
Max. DC Al Conductor Resistance at 20°C (ohm/km)		0,0778	0,0605	0,0469	0,0367	0,0291	0,0247	0,0186	0,0149	0,0127
Weight of Cable (kg/m)		11,4	12,6	13,8	15,4	16,9	19,5	22,5	26,4	30,8

127/220 (245) kV

XLPE Insulated with Cu Wire + Al Tape

Continuous Current Rating for Single Circuit (A)

COPPER CONDUCTOR

Cross-Sectional Area (mm^2)		400	500	630	800	1000	1200	1600	2000	2500
Direct-buried		696	795	909	1026	1143	1316	1469	1622	1776
Pipe		680	778	890	1006	1126	1299	1455	1614	1776
In Air	Trefoil	771	886	1020	1159	1302	1540	1738	1938	2142
	Flat (S=3D)	923	1072	1254	1437	1633	1905	2169	2434	2723

HDPE pipe diameter = 2D

ALUMINIUM CONDUCTOR

Cross-Sectional Area (mm^2)		400	500	630	800	1000	1200	1600	2000	2500
Direct-buried		545	627	720	820	925	1040	1195	1335	1475
Pipe		534	614	704	805	910	1026	1184	1328	1473
In Air	Trefoil	607	703	812	936	1064	1222	1426	1610	1801
	Flat (S=3D)	726	849	993	1152	1319	1504	1764	2004	2258

HDPE pipe diameter = 2D

CONDUCTOR (Cu)	Cross-Sectional Area (mm^2)	400	500	630	800	1000	1200	1600	2000	2500
	Shape	Circular	Circular	Circular	Circular	Circular	Milliken	Milliken	Milliken	Milliken
	Diameter (mm)	23,45	26,4	30,25	34	39	43,5	49,5	56	63,5
Thickness of Conductor Screen (mm)		3,3	1,8	1,2	1,2	1,4	1,4	1,5	1,6	1,6
Thickness of Insulation (mm)		23	22	21	21	20	20	20	20	20
Thickness of Insulation Screen (mm)		1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2
Cu-Screen Cross-Sectional Area (mm^2)		150	150	150	150	150	150	150	150	150
Thickness of Outer Sheath (mm)		3,6	3,6	3,7	3,8	3,8	4	4,2	4,6	4,9
Outer Diameter of Cable (mm)		93	91	92	96	99	105	112	119	128
Weight of Cable (kg/m)		10,3	10,9	12,1	14	16,1	18,3	22,4	26,8	32,8
Max. DC Cu Conductor Resistance at 20°C (ohm/km)		0,047	0,0366	0,0283	0,0221	0,0176	0,0151	0,0113	0,009	0,0072
Capacitance (µF/km)		0,139	0,143	0,156	0,168	0,191	0,209	0,229	0,252	0,277
Inductance (mH/km)		0,462	0,434	0,408	0,394	0,375	0,365	0,352	0,339	0,33

CONDUCTOR (Al)	Cross-Sectional Area (mm^2)	400	500	630	800	1000	1200	1600	2000	2500
	Shape	Circular	Circular	Circular	Circular	Circular	Milliken	Milliken	Milliken	Milliken
	Diameter (mm)	24,25	27,4	30,6	34,8	39	43,5	50,2	56,5	63,5
Max. DC Al Conductor Resistance at 20°C (ohm/km)		0,0778	0,0605	0,0469	0,0367	0,0291	0,0247	0,0186	0,0149	0,0127
Weight of Cable (kg/m)		8,1	8	8,2	9,1	9,9	11,1	12,8	14,7	17

127/220 (245) kV

XLPE Insulated with Cu Wire +Lead Sheath

Continuous Current Rating for Single Circuit (A)

COPPER CONDUCTOR

Cross-Sectional Area (mm^2)		400	500	630	800	1000	1200	1600	2000	2500
Direct-buried		700	799	915	1032	1151	1325	1478	1633	1788
Pipe		696	784	898	1016	1136	1312	1468	1630	1793
In Air	Trefoil	780	897	1034	1175	1322	1561	1762	1967	2174
	Flat (S=3D)	930	1081	1264	1450	1647	1921	2187	2461	2746

HDPE pipe diameter = 2D

ALUMINIUM CONDUCTOR

Cross-Sectional Area (mm^2)		400	500	630	800	1000	1200	1600	2000	2500
Direct-buried		549	630	723	826	931	1047	1203	1344	1485
Pipe		538	619	710	812	919	1036	1195	1341	1487
In Air	Trefoil	614	712	822	948	1078	1238	1444	1632	1826
	Flat (S=3D)	732	856	1001	1162	1330	1517	1779	2022	2277

HDPE pipe diameter = 2D

CONDUCTOR (Cu)	Cross-Sectional Area (mm²)	400	500	630	800	1000	1200	1600	2000	2500
	Shape	Circular	Circular	Circular	Circular	Circular	Milliken	Milliken	Milliken	Milliken
	Diameter (mm)	23,45	26,4	30,25	34	39	43,5	49,5	56	62
Thickness of Conductor Screen (mm)		3,3	1,8	1,2	1,2	1,4	1,4	1,5	1,6	1,6
Thickness of Insulation (mm)		23	22	21	21	20	20	20	20	20
Thickness of Insulation Screen (mm)		1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2
Cu-Screen Cross-Sectional Area (mm²)		150	150	150	150	150	150	150	150	150
Thickness of Lead Sheath (mm)		2,5	2,5	2,5	2,6	2,7	2,8	2,9	3,2	3,2
Thickness of Outer Sheath (mm)		3,8	3,8	3,8	4	4	4,2	4,4	4,8	5,1
Outer Diameter of Cable (mm)		98	96	97	101	104	110	117	125	134
Weight of Cable (kg/m)		18,3	18,7	19,9	22,6	25	28,1	33,5	39,1	46,8
Max. DC Cu Conductor Resistance at 20°C (ohm/km)		0,047	0,0366	0,0283	0,0221	0,0176	0,0151	0,0113	0,009	0,0072
Capacitance (µF/km)		0,139	0,143	0,156	0,166	0,191	0,209	0,229	0,252	0,277
Inductance (mH/km)		0,472	0,444	0,418	0,403	0,383	0,372	0,359	0,347	0,337

CONDUCTOR (Al)	Cross-Sectional Area (mm²)	400	500	630	800	1000	1200	1600	2000	2500
	Shape	Circular	Circular	Circular	Circular	Circular	Milliken	Milliken	Milliken	Milliken
	Diameter (mm)	24,25	27,4	30,6	34,8	39	43,5	50,2	56	63,5
Max. DC Al Conductor Resistance at 20°C (ohm/km)		0,0778	0,0605	0,0469	0,0367	0,0291	0,0247	0,0186	0,0149	0,0127
Weight of Cable (kg/m)		16,2	16	16,2	17,8	18,8	20,8	24,1	26,9	31,1

127/220 (245) kV

XLPE Insulated with Lead Sheath

Continuous Current Rating for Single Circuit (A)

COPPER CONDUCTOR

Cross-Sectional Area (mm^2)		400	500	630	800	1000	1200	1600	2000	2500
Direct-buried		697	797	911	1028	1147	1325	1479	1634	1792
Pipe		682	780	893	1010	1131	1310	1467	1628	1795
In Air	Trefoil	775	890	1026	1166	1311	1559	1760	1967	2182
	Flat (S=3D)	926	1076	1259	1444	1641	1931	2198	2474	2781

HDPE pipe diameter = 2D

ALUMINIUM CONDUCTOR

Cross-Sectional Area (mm^2)		400	500	630	800	1000	1200	1600	2000	2500
Direct-buried		546	628	720	822	927	1047	1204	1345	1482
Pipe		535	615	706	808	914	1035	1195	1340	1483
In Air	Trefoil	609	706	816	941	1071	1238	1447	1634	1819
	Flat (S=3D)	729	852	996	1157	1326	1525	1794	2035	2273

HDPE pipe diameter = 2D

CONDUCTOR (Cu)	Cross-Sectional Area (mm²)	400	500	630	800	1000	1200	1600	2000	2500
	Shape	Circular	Circular	Circular	Circular	Circular	Milliken	Milliken	Milliken	Milliken
	Diameter (mm)	23,45	26,4	30,25	34	39	43,5	49,5	56	63,5
Thickness of Conductor Screen (mm)		3,3	1,8	1,2	1,2	1,4	1,4	1,5	1,6	1,6
Thickness of Insulation (mm)		23	22	21	21	20	20	20	20	20
Thickness of Insulation Screen (mm)		1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2
Thickness of Lead Sheath (mm)		3	3	3	3,1	3,2	3,3	3,4	3,8	4
Thickness of Outer Sheath (mm)		3,7	3,7	3,8	3,9	4	4,1	4,3	4,7	5
Outer Diameter of Cable (mm)		95	93	94	98	102	107	114	123	131
Weight of Cable (kg/m)		18	18,4	19,6	22,3	25,2	28,2	33,4	40,3	48,2
Max. DC Cu Conductor Resistance at 20°C (ohm/km)		0,047	0,0366	0,0283	0,0221	0,0176	0,0151	0,0113	0,009	0,0072
Capacitance (µF/km)		0,139	0,143	0,156	0,168	0,191	0,209	0,229	0,252	0,277
Inductance (mH/km)		0,465	0,440	0,413	0,397	0,377	0,365	0,353	0,343	0,333

CONDUCTOR (Al)	Cross-Sectional Area (mm²)	400	500	630	800	1000	1200	1600	2000	2500
	Shape	Circular	Circular	Circular	Circular	Circular	Milliken	Milliken	Milliken	Milliken
	Diameter (mm)	24,25	27,4	30,6	34,8	39	43,5	50,2	56,5	63,5
Max. DC Al Conductor Resistance at 20°C (ohm/km)		0,0778	0,0605	0,0469	0,0367	0,0291	0,0247	0,0186	0,0149	0,0127
Weight of Cable (kg/m)		15,9	15,6	15,8	17,5	18,8	21	24	28,1	32,5

190/330 (362) kV

XLPE Insulated with Cu Wire + Al Tape

Continuous Current Rating for Single Circuit (A)

COPPER CONDUCTOR

Cross-Sectional Area (mm^2)		800	1000	1200	1600	2000	2500
Direct-buried		1013	1128	1298	1447	1596	1746
Pipe		1000	1117	1287	1441	1593	1751
In Air	Trefoil	1157	1298	1529	1724	1921	2122
	Flat (S=3D)	1402	1596	1859	2113	2384	2659

HDPE pipe diameter = 2D

ALUMINIUM CONDUCTOR

Cross-Sectional Area (mm^2)		800	1000	1200	1600	2000	2500
Direct-buried		809	913	1025	1177	1313	1450
Pipe		800	903	1017	1172	1310	1453
In Air	Trefoil	932	1058	1212	1412	1593	1782
	Flat (S=3D)	1123	1289	1468	1719	1959	2205

HDPE pipe diameter = 2D

CONDUCTOR (Cu)	Cross-Sectional Area (mm^2)	800	1000	1200	1600	2000	2500
	Shape	Circular	Circular	Milliken	Milliken	Milliken	Milliken
	Diameter (mm)	34	39	43,5	49,5	56	63,5
Thickness of Conductor Screen (mm)		1,2	1,4	1,4	1,5	1,6	1,6
Thickness of Insulation (mm)		28	27	27	27	26	26
Thickness of Insulation Screen (mm)		1,2	1,2	1,2	1,2	1,2	1,2
Cu-Screen Cross-Sectional Area (mm^2)		185	185	185	185	185	185
Thickness of Outer Sheath (mm)		4,3	4,3	4,5	4,7	5	5,3
Outer Diameter of Cable (mm)		111	114	120	127	132	141
Weight of Cable (kg/m)		16,6	18,8	21,3	25,2	29,4	35,6
Max. DC Cu Conductor Resistance at 20°C (ohm/km)		0,0221	0,0176	0,0151	0,0113	0,009	0,0072
Capacitance (µF/km)		0,138	0,155	0,168	0,183	0,206	0,227
Inductance (mH/km)		0,425	0,402	0,039	0,375	0,358	0,346

CONDUCTOR (Al)	Cross-Sectional Area (mm^2)	800	1000	1200	1600	2000	2500
	Shape	Circular	Circular	Milliken	Milliken	Milliken	Milliken
	Diameter (mm)	34,8	39	43,5	50,2	56,5	63,5
Max. DC Al Conductor Resistance at 20°C (ohm/km)		0,0367	0,0291	0,0247	0,0186	0,0149	0,0127
Weight of Cable (kg/m)		11,7	12,3	13,8	15,7	17,2	19,9

190/330 (362) kV

XLPE Insulated with Cu Wire +Lead Sheath

Continuous Current Rating for Single Circuit (A)

COPPER CONDUCTOR

Cross-Sectional Area (mm^2)		800	1000	1200	1600	2000	2500
Direct-buried		1018	1135	1306	1457	1607	1758
Pipe		1008	1127	1299	1454	1608	1767
In Air	Trefoil	1171	1316	1548	1747	1947	2151
	Flat (S=3D)	1412	1608	1876	2130	2403	2679

HDPE pipe diameter = 2D

ALUMINIUM CONDUCTOR

Cross-Sectional Area (mm^2)		800	1000	1200	1600	2000	2500
Direct-buried		814	918	1032	1185	1322	1459
Pipe		806	911	1026	1183	1323	1466
In Air	Trefoil	943	1071	1227	1429	1614	1804
	Flat (S=3D)	1131	1299	1479	1732	1974	2221

HDPE pipe diameter = 2D

CONDUCTOR (Cu)	Cross-Sectional Area (mm²)	800	1000	1200	1600	2000	2500
	Shape	Circular	Circular	Milliken	Milliken	Milliken	Milliken
	Diameter (mm)	34	39	43,5	49,5	56	63,5
Thickness of Conductor Screen (mm)		1,2	1,4	1,4	1,5	1,6	1,6
Thickness of Insulation (mm)		28	27	27	27	26	26
Thickness of Insulation Screen (mm)		1,2	1,2	1,2	1,2	1,2	1,2
Cu-Screen Cross-Sectional Area (mm²)		185	185	185	185	185	185
Thickness of Lead Sheath (mm)		2,8	2,9	3	3,2	3,2	3,2
Thickness of Outer Sheath (mm)		4,5	4,5	4,7	4,9	5,2	5,5
Outer Diameter of Cable (mm)		116	120	126	133	141	147
Weight of Cable (kg/m)		27,3	30,2	33,6	39,3	44,6	51
Max. DC Cu Conductor Resistance at 20°C (ohm/km)		0,0221	0,0176	0,0151	0,0113	0,009	0,0072
Capacitance (µF/km)		0,138	0,155	0,168	0,183	0,206	0,227
Inductance (mH/km)		0,432	0,411	0,399	0,373	0,367	0,355

CONDUCTOR (Al)	Cross-Sectional Area (mm²)	800	1000	1200	1600	2000	2500
	Shape	Circular	Circular	Milliken	Milliken	Milliken	Milliken
	Diameter (mm)	34,8	39	43,5	50,2	56	63,5
Max. DC Al Conductor Resistance at 20°C (ohm/km)		0,0367	0,0291	0,0247	0,0186	0,0149	0,0127
Weight of Cable (kg/m)		22,9	23,7	26,1	29,8	31,7	35,3

190/330 (362) kV

XLPE Insulated with Lead Sheath

Continuous Current Rating for Single Circuit (A)

COPPER CONDUCTOR

Cross-Sectional Area (mm^2)		800	1000	1200	1600	2000	2500
Direct-buried		1016	1131	1302	1452	1605	1755
Pipe		1005	1121	1292	1448	1606	1764
In Air	Trefoil	1165	1308	1540	1738	1943	2145
	Flat (S=3D)	1408	1603	1868	2125	2407	2676

HDPE pipe diameter = 2D

ALUMINIUM CONDUCTOR

Cross-Sectional Area (mm^2)		800	1000	1200	1600	2000	2500
Direct-buried		810	915	1029	1181	1322	1460
Pipe		801	906	1020	1178	1321	1467
In Air	Trefoil	933	1066	1221	1423	1611	1806
	Flat (S=3D)	1121	1295	1475	1728	1978	2230

HDPE pipe diameter = 2D

CONDUCTOR (Cu)	Cross-Sectional Area (mm^2)	800	1000	1200	1600	2000	2500
	Shape	Circular	Circular	Milliken	Milliken	Milliken	Milliken
	Diameter (mm)	34	39	43,5	49,5	56	63,5
Thickness of Conductor Screen (mm)		1,2	1,4	1,4	1,5	1,6	1,6
Thickness of Insulation (mm)		28	27	27	27	26	26
Thickness of Insulation Screen (mm)		1,2	1,2	1,2	1,2	1,2	1,2
Thickness of Lead Sheath (mm)		3,5	3,6	3,7	3,9	4,1	4,4
Thickness of Outer Sheath (mm)		4,4	4,5	4,6	4,8	5,2	5,5
Outer Diameter of Cable (mm)		114	118	123	130	136	146
Weight of Cable (kg/m)		27,6	30,6	34,1	39,8	45,6	54,4
Max. DC Cu Conductor Resistance at 20°C (ohm/km)		0,0221	0,0176	0,0151	0,0113	0,009	0,0072
Capacitance (µF/km)		0,138	0,155	0,168	0,183	0,206	0,227
Inductance (mH/km)		0,427	0,407	0,394	0,38	0,364	0,353

CONDUCTOR (Al)	Cross-Sectional Area (mm^2)	800	1000	1200	1600	2000	2500
	Shape	Circular	Circular	Milliken	Milliken	Milliken	Milliken
	Diameter (mm)	34,8	39	43,5	50,2	56,5	63,5
Max. DC Al Conductor Resistance at 20°C (ohm/km)		0,0367	0,0291	0,0247	0,0186	0,0149	0,0127
Weight of Cable (kg/m)		22,8	24,1	26,6	30,4	33,4	38,7

220/380 (420) kV

XLPE Insulated with Cu Wire +Al Tape

Continuous Current Rating for Single Circuit (A)

COPPER CONDUCTOR

Cross-Sectional Area (mm^2)		800	1000	1200	1600	2000	2500	3000
Direct-buried		1006	1120	1287	1434	1583	1730	2004
Pipe		996	1110	1277	1428	1582	1737	2021
In Air	Trefoil	1153	1293	1521	1715	1911	2111	2457
	Flat (S=3D)	1387	1586	1853	2105	2367	2640	3116

HDPE pipe diameter = 2D

ALUMINIUM CONDUCTOR

Cross-Sectional Area (mm^2)		800	1000	1200	1600	2000	2500	3000
Direct-buried		806	906	1017	1166	1302	1436	1640
Pipe		795	897	1008	1161	1301	1440	1652
In Air	Trefoil	928	1054	1214	1405	1585	1772	2038
	Flat (S=3D)	1111	1281	1463	1712	1945	2189	2542

HDPE pipe diameter = 2D

CONDUCTOR (Cu)	Cross-Sectional Area (mm²)	800	1000	1200	1600	2000	2500	3000
	Shape	Circular	Circular	Milliken	Milliken	Milliken	Milliken	Milliken
	Diameter (mm)	34	39	43,5	49,5	56	63,5	71
Thickness of Conductor Screen (mm)		1,8	1,4	1,4	1,5	1,6	1,6	1,6
Thickness of Insulation (mm)		30	28	27	27	27	27	27
Thickness of Insulation Screen (mm)		1,2	1,2	1,2	1,2	1,2	1,2	1,2
Cu-Screen Cross-Sectional Area (mm²)		185	185	185	185	185	185	185
Thickness of Outer Sheath (mm)		4,4	4,4	4,5	4,7	5,1	5,3	5,6
Outer Diameter of Cable (mm)		116	117	120	127	134	143	152
Weight of Cable (kg/m)		17,6	19,2	21,3	25,4	29,9	36	42,7
Max. DC Cu Conductor Resistance at 20°C (ohm/km)		0,0221	0,0176	0,0151	0,0113	0,009	0,0072	0,006
Capacitance (µF/km)		0,135	0,151	0,168	0,182	0,2	0,22	0,241
Inductance (mH/km)		0,433	0,405	0,39	0,375	0,362	0,349	0,336

CONDUCTOR (Al)	Cross-Sectional Area (mm²)	800	1000	1200	1600	2000	2500	3000
	Shape	Circular	Circular	Milliken	Milliken	Milliken	Milliken	Milliken
	Diameter (mm)	34,8	39	43,5	50,2	56,5	63,5	71
Max. DC Al Conductor Resistance at 20°C (ohm/km)		0,0367	0,0291	0,0247	0,0186	0,0149	0,0127	0,0099
Weight of Cable (kg/m)		12,7	12,7	13,8	15,9	17,7	20,3	23,4

220/380 (420) kV

XLPE Insulated with Cu Wire +Lead Sheath

Continuous Current Rating for Single Circuit (A)

COPPER CONDUCTOR

Cross-Sectional Area (mm^2)		800	1000	1200	1600	2000	2500	3000
Direct-buried		1011	1126	1295	1444	1592	1801	2017
Pipe		1003	1199	1289	1441	1595	1812	2039
In Air	Trefoil	1166	1310	1539	1737	1936	2205	2490
	Flat (S=3D)	1396	1597	1867	2121	2388	2743	3138

HDPE pipe diameter = 2D

ALUMINIUM CONDUCTOR

Cross-Sectional Area (mm^2)		800	1000	1200	1600	2000	2500	3000
Direct-buried		808	911	1023	1174	1310	1446	1651
Pipe		802	904	1018	1172	1311	1453	1668
In Air	Trefoil	938	1066	1220	1422	1604	1793	2062
	Flat (S=3D)	1118	1290	1474	1725	1963	2204	2558

HDPE pipe diameter = 2D

CONDUCTOR (Cu)	Cross-Sectional Area (mm²)	800	1000	1200	1600	2000	2500	3000
	Shape	Circular	Circular	Milliken	Milliken	Milliken	Milliken	Milliken
	Diameter (mm)	34	39	43,5	49,5	56	63,5	71
Thickness of Conductor Screen (mm)		1,8	1,4	1,4	1,5	1,6	1,6	1,6
Thickness of Insulation (mm)		30	28	27	27	27	27	27
Thickness of Insulation Screen (mm)		1,2	1,2	1,2	1,2	1,2	1,2	1,2
Cu-Screen Cross-Sectional Area (mm²)		185	185	185	185	185	185	185
Thickness of Lead Sheath (mm)		2,9	2,9	3	3,2	3,2	3,2	3,2
Thickness of Outer Sheath (mm)		4,6	4,6	4,7	4,9	5,3	5,5	5,8
Outer Diameter of Cable (mm)		122	122	126	133	141	149	158
Weight of Cable (kg/m)		29,1	30,8	33,6	39,3	44,6	51,7	60
Max. DC Cu Conductor Resistance at 20°C (ohm/km)		0,0221	0,0176	0,0151	0,0113	0,009	0,0072	0,006
Capacitance (µF/km)		0,135	0,151	0,168	0,182	0,2	0,22	0,241
Inductance (mH/km)		0,442	0,415	0,399	0,384	0,37	0,351	0,344

CONDUCTOR (Al)	Cross-Sectional Area (mm²)	800	1000	1200	1600	2000	2500	3000
	Shape	Circular	Circular	Milliken	Milliken	Milliken	Milliken	Milliken
	Diameter (mm)	34,8	39	43,5	50,2	56,5	63,5	71
Max. DC Al Conductor Resistance at 20°C (ohm/km)		0,0367	0,0291	0,0247	0,0186	0,0149	0,0127	0,0099
Weight of Cable (kg/m)		24,7	24,2	26,1	29,9	32,4	36	40,7

220/380 (420) kV

XLPE Insulated with Lead Sheath

Continuous Current Rating for Single Circuit (A)

COPPER CONDUCTOR

Cross-Sectional Area (mm^2)		800	1000	1200	1600	2000	2500	3000
Direct-buried		1009	1124	1292	1440	1589	1798	2015
Pipe		1000	1115	1283	1437	1590	1808	2036
In Air	Trefoil	1161	1303	1532	1729	1929	2200	2487
	Flat (S=3D)	1392	1593	1862	2116	2382	2738	3138

HDPE pipe diameter = 2D

ALUMINIUM CONDUCTOR

Cross-Sectional Area (mm^2)		800	1000	1200	1600	2000	2500	3000
Direct-buried		805	909	1021	1170	1307	1444	1649
Pipe		799	901	1013	1167	1308	1451	1666
In Air	Trefoil	934	1061	1214	1415	1599	1789	2060
	Flat (S=3D)	1115	1287	1471	1721	1957	2203	2560

HDPE pipe diameter = 2D

CONDUCTOR (Cu)	Cross-Sectional Area (mm²)	800	1000	1200	1600	2000	2500	3000
	Shape	Circular	Circular	Milliken	Milliken	Milliken	Milliken	Milliken
	Diameter (mm)	34	39	43,5	49,5	56	63,5	71
Thickness of Conductor Screen (mm)		1,8	1,4	1,4	1,5	1,6	1,6	1,6
Thickness of Insulation (mm)		30	28	27	27	27	27	27
Thickness of Insulation Screen (mm)		1,2	1,2	1,2	1,2	1,2	1,2	1,2
Thickness of Lead Sheath (mm)		3,7	3,7	3,7	3,9	4,2	4,4	4,7
Thickness of Outer Sheath (mm)		4,6	4,6	4,6	4,9	5,2	5,5	5,8
Outer Diameter of Cable (mm)		120	120	123	131	138	148	158
Weight of Cable (kg/m)		29,9	31,6	34,1	39,9	46,7	55,1	65,3
Max. DC Cu Conductor Resistance at 20°C (ohm/km)		0,0221	0,0176	0,0151	0,0113	0,009	0,0072	0,006
Capacitance (µF/km)		0,135	0,151	0,168	0,182	0,2	0,22	0,241
Inductance (mH/km)		0,438	0,411	0,394	0,38	0,364	0,355	0,343

CONDUCTOR (Al)	Cross-Sectional Area (mm²)	800	1000	1200	1600	2000	2500	3000
	Shape	Circular	Circular	Milliken	Milliken	Milliken	Milliken	Milliken
	Diameter (mm)	34,8	39	43,5	50,2	56,5	63,5	71
Max. DC Al Conductor Resistance at 20°C (ohm/km)		0,0367	0,0291	0,0247	0,0186	0,0149	0,0127	0,0099
Weight of Cable (kg/m)		22,8	25,1	26,6	30,6	34,5	39,4	40,7

290/500 (550) kV

XLPE Insulated with Cu Wire + Al Tape

Continuous Current Rating for Single Circuit (A)

COPPER CONDUCTOR

Cross-Sectional Area (mm^2)		800	1000	1200	1600	2000	2500	3000
Direct-buried		983	1095	1255	1354	1537	1754	1933
Pipe		979	1093	1253	1355	1543	1772	1956
In Air	Trefoil	1139	1280	1498	1637	1877	2168	2394
	Flat (S=3D)	1348	1531	1788	1982	2289	2664	2989

HDPE pipe diameter = 2D

ALUMINIUM CONDUCTOR

Cross-Sectional Area (mm^2)		800	1000	1200	1600	2000	2500	3000
Direct-buried		785	885	991	1118	1269	1399	1597
Pipe		782	883	990	1118	1274	1409	1614
In Air	Trefoil	915	1041	1186	1359	1560	1741	2004
	Flat (S=3D)	1079	1236	1412	1635	1897	2122	2470

HDPE pipe diameter = 2D

CONDUCTOR (Cu)	Cross-Sectional Area (mm^2)	800	1000	1200	1600	2000	2500	3000
	Shape	Circular	Circular	Milliken	Milliken	Milliken	Milliken	Milliken
	Diameter (mm)	34	39	43,5	49,5	56	63,5	71
Thickness of Conductor Screen (mm)		3	2,4	2,7	2	1,6	1,6	1,6
Thickness of Insulation (mm)		33	33	31	30	30	30	30
Thickness of Insulation Screen (mm)		1,2	1,2	1,2	1,2	1,2	1,2	1,2
Cu-Screen Cross-Sectional Area (mm^2)		185	185	185	185	185	185	185
Thickness of Outer Sheath (mm)		4,7	4,8	4,8	4,9	5,3	5,6	5,8
Outer Diameter of Cable (mm)		130	134	136	139	147	155	162
Weight of Cable (kg/m)		19,3	21,7	23,5	27	31,7	37,6	43,8
Max. DC Cu Conductor Resistance at 20°C (ohm/km)		0,0221	0,0176	0,0151	0,0113	0,009	0,0072	0,006
Capacitance (µF/km)		0,132	0,14	0,158	0,172	0,187	0,204	0,219
Inductance (mH/km)		0,456	0,434	0,415	0,394	0,379	0,365	0,354

CONDUCTOR (Al)	Cross-Sectional Area (mm^2)	800	1000	1200	1600	2000	2500	3000
	Shape	Circular	Circular	Milliken	Milliken	Milliken	Milliken	Milliken
	Diameter (mm)	34,8	39	43,5	50,2	56,5	63,5	71
Max. DC Al Conductor Resistance at 20°C (ohm/km)		0,0367	0,0291	0,0247	0,0186	0,0149	0,0127	0,0099
Weight of Cable (kg/m)		14,5	15,4	16,2	17,6	19,3	21,9	24,5

290/500 (550) kV

XLPE Insulated with Cu Wire +Lead Sheath

Continuous Current Rating for Single Circuit (A)

COPPER CONDUCTOR

Cross-Sectional Area (mm^2)		800	1000	1200	1600	2000	2500	3000
Direct-buried		989	1102	999	1363	1547	1757	1945
Pipe		987	1102	998	1367	1557	1775	1973
In Air	Trefoil	1151	1294	1198	1655	1898	2172	2422
	Flat (S=3D)	1356	1540	1421	1991	2303	2666	3006

HDPE pipe diameter = 2D

ALUMINIUM CONDUCTOR

Cross-Sectional Area (mm^2)		800	1000	1200	1600	2000	2500	3000
Direct-buried		789	891	1263	1126	1277	1408	1607
Pipe		787	891	1264	1129	1284	1421	1628
In Air	Trefoil	925	1051	1513	1374	1577	1759	2025
	Flat (S=3D)	1085	1244	1800	1646	1904	2134	2485

HDPE pipe diameter = 2D

CONDUCTOR (Cu)	Cross-Sectional Area (mm^2)	800	1000	1200	1600	2000	2500	3000
	Shape	Circular	Circular	Milliken	Milliken	Milliken	Milliken	Milliken
	Diameter (mm)	34	39	43,5	49,5	56	63,5	71
Thickness of Conductor Screen (mm)		3	2,4	2,7	2	1,6	1,6	1,6
Thickness of Insulation (mm)		33	33	31	30	30	30	30
Thickness of Insulation Screen (mm)		1,2	1,2	1,2	1,2	1,2	1,2	1,2
Cu-Screen Cross-Sectional Area (mm^2)		185	185	185	185	185	185	185
Thickness of Lead Sheath (mm)		3,2	3,2	3,2	3,2	3,2	3,2	3,2
Thickness of Outer Sheath (mm)		4,9	5	5	5,1	5,5	5,8	6
Outer Diameter of Cable (mm)		137	141	142	145	153	161	168
Weight of Cable (kg/m)		33,6	36,4	38,4	42,3	47,7	54,6	61,5
Max. DC Cu Conductor Resistance at 20°C (ohm/km)		0,0221	0,0176	0,0151	0,0113	0,009	0,0072	0,006
Capacitance (µF/km)		0,132	0,14	0,158	0,172	0,187	0,204	0,219
Inductance (mH/km)		0,465	0,443	0,424	0,402	0,388	0,373	0,361

CONDUCTOR (Al)	Cross-Sectional Area (mm^2)	800	1000	1200	1600	2000	2500	3000
	Shape	Circular	Circular	Milliken	Milliken	Milliken	Milliken	Milliken
	Diameter (mm)	34,8	39	43,5	50,2	56,5	63,5	71
Max. DC Al Conductor Resistance at 20°C (ohm/km)		0,0367	0,0291	0,0247	0,0186	0,0149	0,0127	0,0099
Weight of Cable (kg/m)		28,8	30,1	31,2	32,9	35,3	38,9	42,2

290/500 (550) kV

XLPE Insulated with Lead Sheath

Continuous Current Rating for Single Circuit (A)

COPPER CONDUCTOR

Cross-Sectional Area (mm^2)		800	1000	1200	1600	2000	2500	3000
Direct-buried		986	1099	1260	1359	1545	1755	1944
Pipe		984	1099	1260	1362	1554	1772	1972
In Air	Trefoil	1146	1289	1507	1648	1893	2168	2419
	Flat (S=3D)	1353	1536	1795	1986	2299	2664	3004

HDPE pipe diameter = 2D

ALUMINIUM CONDUCTOR

Cross-Sectional Area (mm^2)		800	1000	1200	1600	2000	2500	3000
Direct-buried		787	889	995	1123	1276	1406	1606
Pipe		785	888	995	1125	1283	1419	1628
In Air	Trefoil	920	1047	1193	1368	1573	1756	2023
	Flat (S=3D)	1082	1241	1417	1641	1901	2133	2483

HDPE pipe diameter = 2D

CONDUCTOR (Cu)	Cross-Sectional Area (mm^2)	800	1000	1200	1600	2000	2500	3000
	Shape	Circular	Circular	Milliken	Milliken	Milliken	Milliken	Milliken
	Diameter (mm)	34	39	43,5	49,5	56	63,5	71
Thickness of Conductor Screen (mm)		3	2,4	2,7	2	1,6	1,6	1,6
Thickness of Insulation (mm)		33	33	31	30	30	30	30
Thickness of Insulation Screen (mm)		1,2	1,2	1,2	1,2	1,2	1,2	1,2
Cross-Sectional Area (mm^2)		3,7	3,8	3,8	3,9	4,3	4,5	4,7
Thickness of Outer Sheath (mm)		4,8	4,9	4,9	5,1	5,5	5,7	6
Outer Diameter of Cable (mm)		134	138	140	143	151	160	168
Weight of Cable (kg/m)		33,5	36,8	38,9	43,3	50,9	59	67,4
Max. DC Cu Conductor Resistance at 20°C (ohm/km)		0,0221	0,0176	0,0151	0,0113	0,009	0,0072	0,006
Capacitance (µF/km)		0,132	0,14	0,158	0,172	0,187	0,204	0,219
Inductance (mH/km)		0,461	0,44	0,42	0,399	0,386	0,371	0,360

CONDUCTOR (Al)	Cross-Sectional Area (mm^2)	800	1000	1200	1600	2000	2500	3000
	Shape	Circular	Circular	Milliken	Milliken	Milliken	Milliken	Milliken
	Diameter (mm)	34,8	39	43,5	50,2	56,5	63,5	71
Max. DC Al Conductor Resistance at 20°C (ohm/km)		0,0367	0,0291	0,0247	0,0186	0,0149	0,0127	0,0099
Weight of Cable (kg/m)		28,8	30,5	31,6	34	38,4	43,3	48,1

DEMİRER CABLE
QUALITY CONTROL

1.70 Quality Control

High and Extra High Voltage Cable production requires highest possible precision at manufacturing stage, similar capable Quality Control experience and equipments in order to achieve best quality.

Being aware of this fact Demirer Kablo gives utmost importance to Quality Control, therefore continuously making remarkable investments to state of the art testing equipments as well as following up of new technologies and keeping Q.C. personnel highly trained.

High quality raw material is the prerequisite for high quality finish product therefore Demirer kablo uses only reputable suppliers.

Some of our Quality Control Equipments and their purpose are listed below in three Categories:

1.Quality Control Equipments:

a **CSS2 Cleanliness Scanning System** which detects any particulars prior to extrusion (x-head), warns, and keeps image of the particular.

b **Sikora X-Ray 8000 Wall thickness measuring device** scans hot wall thicknesses and eccentricity of three layer and warns if tolerance exceeded.

c **IPEC Ultrasense – Ultrasound Flaw Detection** detects any bubble or protrusion penetration, measures cold wall thicknesses of three layers, warns if tolerances exceeded and keep log for future checking.

d **Sikora X-Y Diameter Gauge** measures cold diameter from both axis.

Quality Control

2. High Voltage Test Equipment

a 1.050 kV – 22.500 kVA AC Test System capable of
- I. Long term High Voltage Tests
- II. System Type Tests
- III. AC Step Voltage Tests

b Impulse Test System
- 2.400 kV – 120 kJ Lightning Impulse -
- 1.540, + 1.050 Switching Impulse
- I. Lightning & Switching Impulse Voltage Tests

c 500 kV – 20.000 kVA AC Resonant Test System
- Partial Discharge Dedector
- I. High Voltage Tests
- II. Partial Discharge Tests

d 350 kV – 4.000 kVA AC Resonant Test System
- Partial Discharge Dedector
- I. High Voltage Tests
- II. Partial Discharge Tests

e Impulse Test System
- 1.400 kV – 42 kJ Lightning Impulse
- I. Lightning Impulse Voltage Tests

f 150 kV – 125 kVA AC Dielectric Test Set
- I. Long Term Voltage Tests
- II. Type Tests

g 525 kV – 3 kW DC Test System
- I. DC Voltage Tests
- II. Site Tests

h Schering Bridge
- I. Tan Measurement
- II. Capacitance Measurement

i Cable Heating Test System
- I. Heating Cycle Voltage Test
- II. Water Penetration Tests

Quality Control

3. Non-Electrical Test Equipment

a. Moisture Content (two spaces) Measuring Device
   I. Insulation and SC materials moisture content measurement

b. Fourier Transform Infrared Spectrometer (FTIR)
   I. Spectral Analysis of Insulation and Sheath materials

c. Thermogravimetric Analyzer (TGA)
   I. Insulation and sheath materials
      By product concentration
      OIT
      Carbon Black Measurements

d. Thermal Analysis Equipment & DSC
   I. Insulation, sheath and various materials
      Thermal Analysis
      Melting Point Measurements

e. Digital Microohm-meter
   I. DC Resistance Measurement

f. Optical Thickness Measuring Systems
   I. Thickness Measurement

g. Flame Spread Test Cell
   I. Flame Spread Test

h. Smoke Density Test Room
   I. Smoke Density Test

i. Universal Test System
   I. Tensile strength and elongation measurements

1.80 Cable Accessories

- Straight and Insulated Joints.
- Porcelain and Composite type of Outdoor Terminations.
- GIS and Transformer Terminations(oil-type and dry-type)
- Link Boxes for Direct Earthing and Cross-Bonding Connections.
- DTS (Distributed Temperature Sensing) Systems with integrated optical fibre in metallic tube or with seperated FO cable fixed over power cables.

Site Services

Underground power cable lines are installed commonly inside modernized cities due toexistence of highway crossings, bridges and many sophisticated buildings. Underground power cable installation enables non-disturbance of existing structures. XLPE power cable technology provides a long-term reliable system which does not require maintenance.

DEMİRER KABLO well trained technical team is capable of organizing, carrying out and performing the tests of all kinds of HV XLPE cable projects between 60 kV and 400 kV allaround the world.

Our Services

1) Supply and installation of XLPE underground

2) Supply and installation of power cable accessories

3) System design of power cable & FO cable systems

4) Project management.

5) Power cable installation civil works

6) Installation of power cable accessories, supervision, testing & commissioning

7) Fault location & cable repair

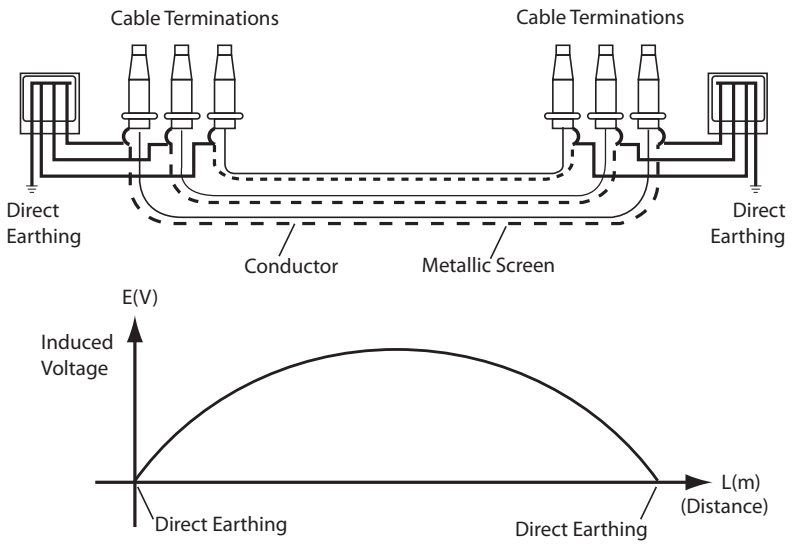
8) Training of customer personnel

1.90 Cable System Configurations

Both-End Bonding

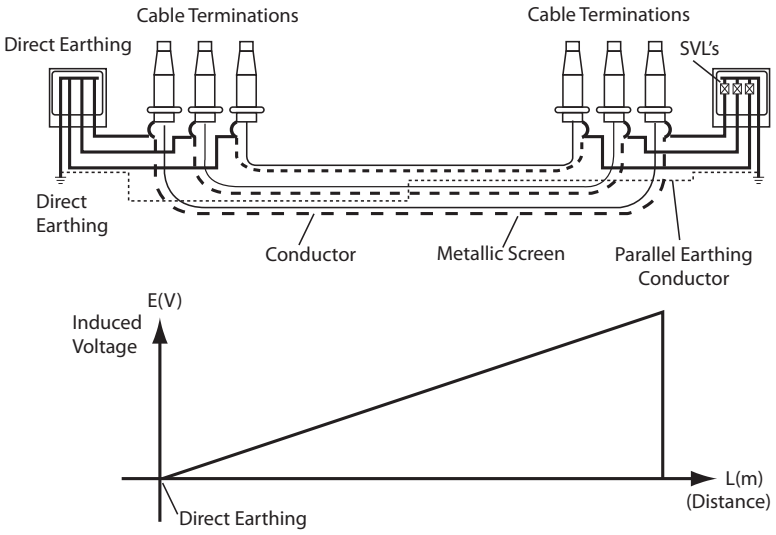
This system is mostly designed for short length of circuits. A current continuously flows on the metallic screen because both ends are earthed.

It will automatically reduce the current carrying capacity in the conductor of cable while it provides no touching voltage at both ends. This is a common method for the short lengths of open switchyards and transformer circuits.



Single-Point Bonding

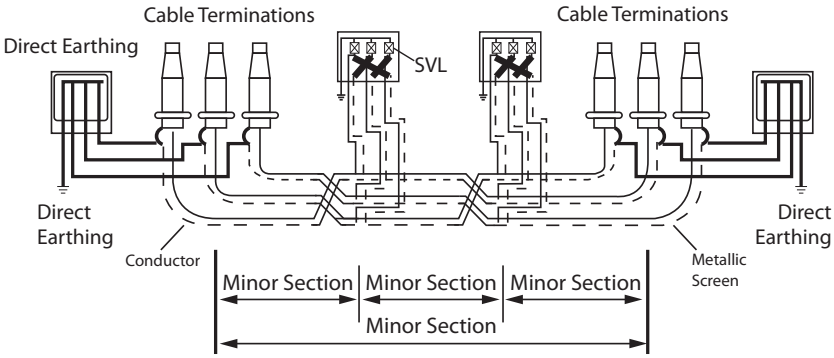
This system is designed to prevent circulation currents on the metallic screen of the cable. This increases current carrying capacity of the cable directly. Induced voltage over metallic screen on the cable is proportionalto the cable length and the current passing through the conductor. Single-Point Bonding Method can only be used for limited route lengths. Maximum length is limited by the screen voltage induced at the open end (SVL side).

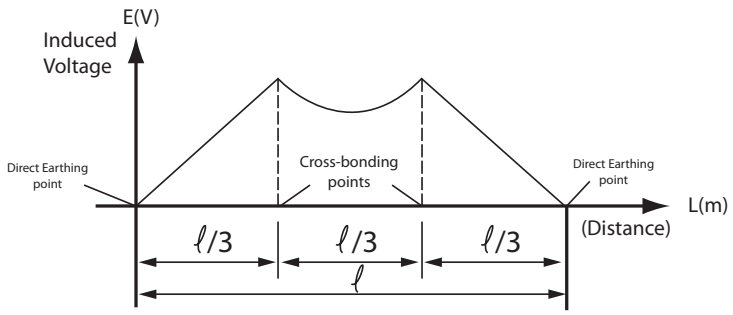


Cross Bonding

Cross-Bonding Method is commonly used for long lengths of circuits to balance the Impedances of the phases for flat formation and to minimize the induced voltages occured on the metallic screens of the cables at the same time.

Transposition equalizes the impedances while the cross-bonding connections made in the link boxes minimize the induced voltages. A current flowsthrough the metallic sheath connections, but no significant current flows through the screens.





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