



UNIVERSAL CABLE (M) BERHAD  
(Co. No.: 7042-D)



THE UNIVERSAL CHOICE

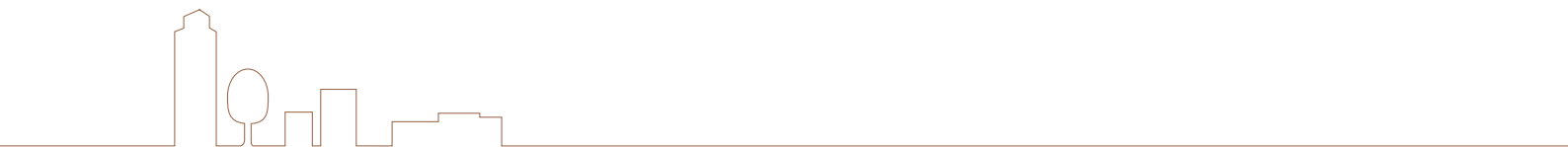


## XLPE INSULATED POWER CABLES



A Member of SARAWAK CABLE BERHAD GROUP







# INTRODUCTION

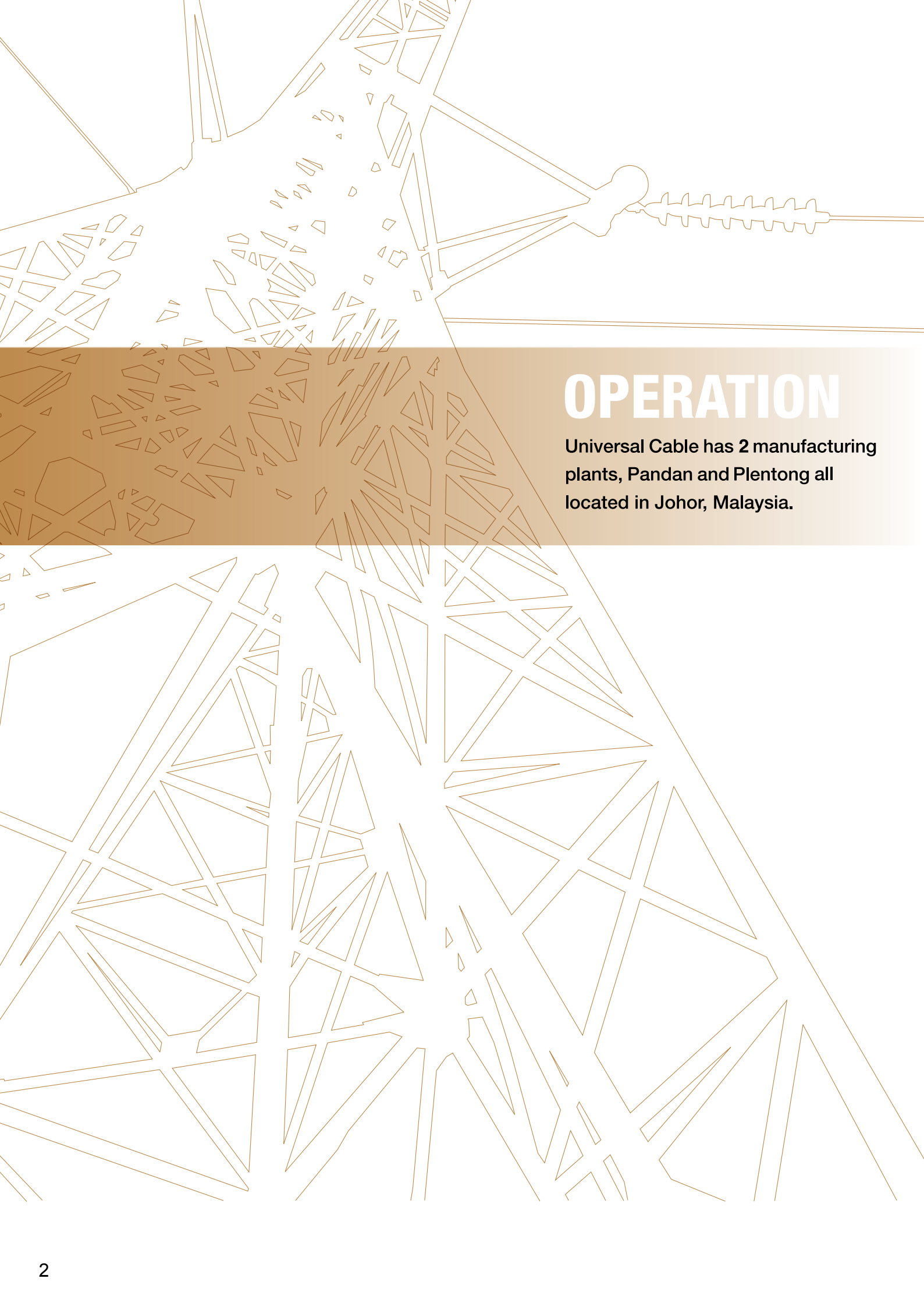
## History

Universal Cable (M) Berhad was established in March 1967. Phenomenal growth and success over the years has enabled Universal Cable to achieve the formidable status as the largest cable manufacturer in Malaysia and most trusted cable and wire manufacturer in the region.

## Universal Cable Today

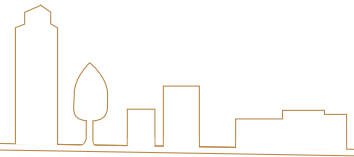
Universal Cable today has a broad manufacturing portfolio of cable and wire products, which includes advanced power and control cables, instrumentation cables, aluminium conductors and cables, cables for the oil & gas industry and various types of specialty cables such as welding cables and automotive cables.





# OPERATION

**Universal Cable has 2 manufacturing plants, Pandan and Plentong all located in Johor, Malaysia.**



## Pandan

Our Pandan plant commenced its manufacturing operation in the 1970s. Since then, Pandan has broadened its range of products to include:

- Low voltage power and control cables
- Offshore, marine and shipboard cables
- Fire resistant and flame retardant cables
- Instrumentation cables and
- Specialty cables
- Aluminium conductors
- Aluminium power cables
- Aerial bundle cables (ABC)



## Plentong

The Plentong plant was set up in the early 90s and started producing Medium Voltage and High Voltage cables in 1995. Universal Cable Plentong has the ability and technology to manufacture Medium Voltage and High Voltage cables up to 275kV. Universal Cable is the first and only cable manufacturer in Malaysia with the ability and technology to manufacture up to 275kV power cables.

With this capability, Universal Cable produces products that are highly demanded by the electricity authorities locally and internationally.

## QUALITY ASSURANCE & CERTIFICATIONS



Over the years, Universal Cable has been bestowed with many certifications and awards from the most stringent local and international accreditation authorities.

Universal Cable has spared no efforts in maintaining and constantly upgrading its sophisticated product Research & Development capabilities. We have made remarkable headway through our constant investments in new state-of-the-art machinery that incorporate the latest technologies. In addition, our testing equipments represent the most stringent standards applied in the manufacture of our extensive range of cables.

Universal Cable's unrelenting pursuit for impeccable product quality and functional enhancements, and improvements strongly reaffirms our total dedication and devotion to our product Research & Development strengths and achievements.

Our stringent emphasis on total quality control and exhaustive testing at all stages of cable production further enhance the demanding standards that are exacted on our cable products. Universal Cable products are renowned for maximum operating efficiency under the most severe operating environments.

Our extensive and in-depth commitment to Total Customer Satisfaction, gained us both local and international recognitions and certifications. The quality management system MS ISO 9001:2015 certification and the type tests by KEMA from Netherlands, CESI from Italy, ABS from the United States, LR from United Kingdom, PSB from Singapore and SIRIM from Malaysia are testaments to our total commitment in product quality and manufacturing excellence. The ISO 45001:2018 (OHSAS 18001:2007) Management Systems and our pursuance of ISO 14001:2015 in Environmental Management System demonstrates our pledge towards a safe & healthy workplace, practices and legislative compliances.



## AWARDS & ACCOLADES



In 2005 & 2006, the Malaysia International Trade and industry (MITI) recognized our efforts by way of Export Excellence Merit status. In 2007, we were honored with the prestigious Export Excellence Award (Merchandise) from the MITI.

We are the first cable manufacturer in Malaysia to receive both the prestigious Business Superbrands Malaysia in 2006 and the coveted BrandLaureate Award for 7 consecutive terms of 2006/2007, 2007/2008, 2008/2009, 2009/2010, 2010/2011, 2011/2012 & 2012/2013 for the Best Brands in Asiz Pacific. Pioneering the industry, our commitment towards manufacturing excellence has also been recognized by receiving the coveted Frost & Sullivan Malaysia Manufacturing Excellence Award (Gold-Engineering Category) in 2008. In 2009, we were awarded the Brand Excellence Award (certificate) by MITI.

Our vision is to be the dominant world-class cable manufacturer in ASEAN. Our mission is to manufacture cables for electricity supply and information & communication technology to meet the needs of the public. We uphold our universal values to ensure total customer satisfaction, strive for continuous growth and create value for our shareholders.





# INTERNATIONAL MARKET

**Our remarkable achievement in transcending local market boundaries into the international arena is witnessed by the global partners with which Universal Cable have developed strong affiliations.**

**Our list of international destinations grows from Australia, Fiji Islands, New Zealand, Brunei, China, India, Indonesia, Japan, Maldives, Nepal, Pakistan, South Korea, Sri Lanka, Philippines, Singapore, Vietnam, Cambodia, Oman, Jordan, Sudan, UAE, Djibouti, Yemen, Bahrain, Saudi Arabia, Mauritius, South Africa, Myanmar, Papua New Guinea, Hong Kong, Brazil, Germany, Bangladesh, which demonstrates the wide reach of our cable products.**

**Today, the brand name Universal Cable has become synonymous with product excellence and gained worldwide recognition for its premium quality.**

# A ) XLPE INSULATED POWER CABLES

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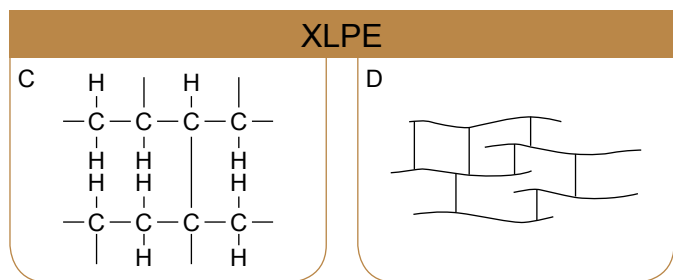
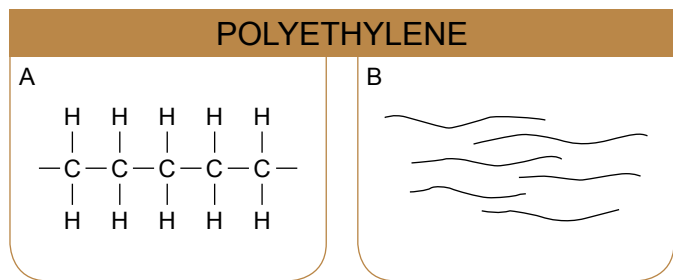


# WHAT IS XLPE?

XLPE is an abbreviated designation of “cross-linked polyethylene”. Polyethylene has a linear molecular structure as shown in A. Molecules of polyethylene not chemically bonded as shown in B are easily deformed at high temperature, while XLPE molecules bonded in a three dimensional network as shown in C and D, have strong resistance to deformation even at high temperature.

Cross linked polyethylene is produced from polyethylene under high pressure with organic peroxides as additives. The application of heat and pressure is used to effect the cross linking. This causes the individual molecular chains to link with one another which in turn causes the material to change from a thermoplastic to an elastic material.

An important advantage of XLPE as insulation for medium and high voltage cables is their low dielectric loss. The dielectric loss factor is about one decimal power lower than that of paper insulated cables and about two decimal powers lower than that of PVC-insulated cables. Since the dielectric constant is also more favourable, the mutual capacitance of XLPE cables is also lower, thus reducing the charging currents and earth-leakage currents in networks without the rigid star-point earthing.



# CHARACTERISTICS ADVANTAGES OF XLPE

## **Excellent Electrical and Physical Properties**

XLPE cable constitutes the best cable for transmission and distribution lines because of its excellent electrical and physical properties.

## **Capability of Carrying Large Currents**

The excellent resistance to thermal deformation and the excellent aging property of XLPE cable permit it to carry large current under normal (90 °C), emergency (130 °C) or short circuit (250 °C) conditions.



## **Ease of Installation**

XLPE cable withstands smaller radius bending and is lighter in weight, allowing for easy and reliable installation. Furthermore, the splicing and terminating methods for XLPE cable are simpler in comparison with other kinds of cables.

## **Free from Height Limitation and Maintenance**

XLPE cable can be installed anywhere without special consideration of the route profile (height limitations) since it does not contain oil and thus is free from failures due to oil migration in oil-filled cables.

## **No Metallic Sheath Required**

XLPE cable does not generally demand a metallic sheath. Thus it is free from the failures peculiar to metallic-sheathed cable, such as corrosion and fatigue.

# MANUFACTURING PROCESS OF XLPE CABLE



In the manufacture of medium and high voltage XLPE cable, our plant uses the latest technology available in the field by using an integrated high performance extrusion line which consists of a triple-layer crosshead and a water-free Completely Dry Curing and Cooling (CDCC) gas-vulcanizing process. This type of extrusion line minimises the risk of introducing external contaminants and produces high quality XLPE cable.

The conductor is paid off continuously through a metering capstan (which is the line speed master point), a triple extruder crosshead, a vulcanizing tube, an eccentricity monitoring unit, and haul-off caterpillars, and finally taken up.

Using a group of three extruders, the triple crosshead allows simultaneous extrusion of the cable insulation and two semiconducting screens with a high degree of smoothness and no voids or introduction of external contaminants. Precise and stable temperatures at the crosshead are achieved by using multiple zone temperature controls.

In the water-free CDCC gas-vulcanizing process, the triple-extruded cable core is cured in an inert pressurised gas tube and heated to the required temperature for material cross-linking. By varying the curing temperature and time, different cure percentages can be achieved as per customer requirements.

The various functions of our integrated extrusion line such as line speed and curing tube temperatures synchronisation are monitored and controlled via the process automation computers to ensure production of quality ramps. Calculated ramp parameters can be preset on the control unit and closed circuit TV system is used to ease the running of the lines.

# STRUCTURAL DESIGN AND PERFORMANCE OF XLPE CABLE

The design of XLPE cables conform to international standards and are similar to those in IEC 60502 and IEC 60840.

XLPE insulated cable for medium and high voltages have, in general, circular conductors and only single core construction is adopted for the latter. Conductors may be of compacted stranded aluminium or stranded copper and special care is taken to ensure a smooth profile, free from sharp juts that could damage the insulation due to high local electric stresses.

All XLPE insulated cables of Medium Voltage are supplied with extruded cross-linked semi conducting screens to protect the main solid XLPE insulation. The conductor screen fills the interstices between the wires and provides a smooth circular envelope around the conductor. This diminishes the concentration of flux lines around the individual wires and hence the electrical stress around the conductor. While the insulation screen can be either strippable or bonded for MV cables depending on the customer's option, bonded screen is used exclusively for high voltage cables.

A layer of copper wires, applied over the extruded insulation screen, as a metallic screen, provides an earthed envelope. The cross sectional area of this metallic screen is determined in order to satisfy the phase to earth fault level in the network.



# PROCESS OF XLPE CABLE

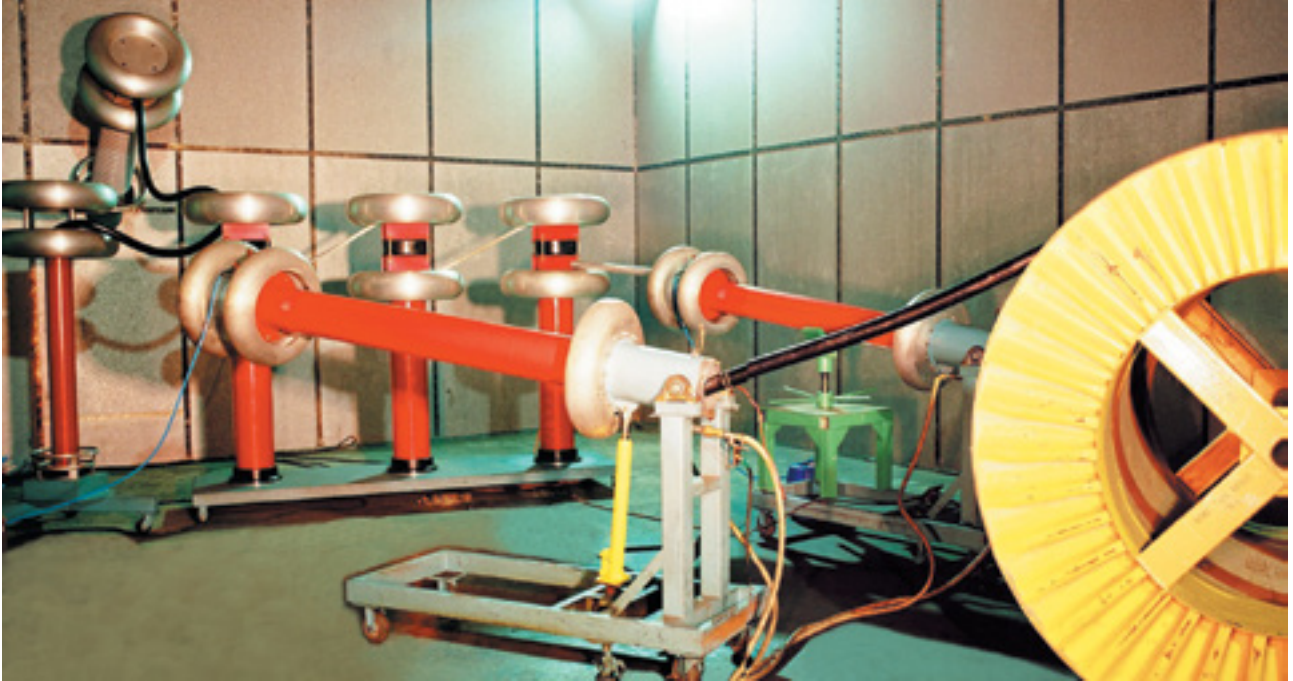
Although it has been verified that XLPE cables can be applied with a conductor temperature of 130°C for emergency overload conditions, it must be understood that the erecting and laying conditions necessary to allow for those temperatures must be accurately carried out and controlled during installation in order to restrict thermomechanical problems. To be realistic, emergency conditions should be confined to 110°C at conductor with the balance of 20°C premeditated as a safety margin to cope with some concerns in the laying conditions.

Subsequent to the constant use of XLPE for medium and high voltages for many years in the past, our plant has extensive field test result which evidently witness that XLPE insulated cables are of excellent quality particularly in respect of :

- partial discharges withstandability
- impulse test withstandability
- moisture resistance
- overload current-test under dielectric stress and thermic cycles



# TESTING PROCEDURES FOR XLPE CABLE



At our plant the testing process of XLPE cables and its accessories is subjected to the most stringent standards to ensure that our products meet the quality required for optimum problem free performance.

In this respect our plant uses advanced state of the art testing equipment in a strict series of test processes to achieve the exacting quality standards.

## **Among the main test equipment**

1. Partial Discharge Test System
2. Impulse Test System
3. Capacitance & Power Factor Measuring Bridge
4. A.C High Voltage Test System
5. A.C Long Time Test System

# TESTING PROCEDURES FOR XLPE CABLE

The different tests employed are listed as such :

## **Routine Test**

These are tests to monitor overall cable quality and function. Tests listed here include high voltage tests, conductor resistance test, insulation resistance tests and voltage tests on protective sheath coverings.

## **Type Tests**

These tests are used to calibrate and validate cable design type and they include bending tests, thermal stability tests, impulse voltage tests, heat distortion tests, corona level tests and dielectric thermal resistance tests.

## **Special Tests**

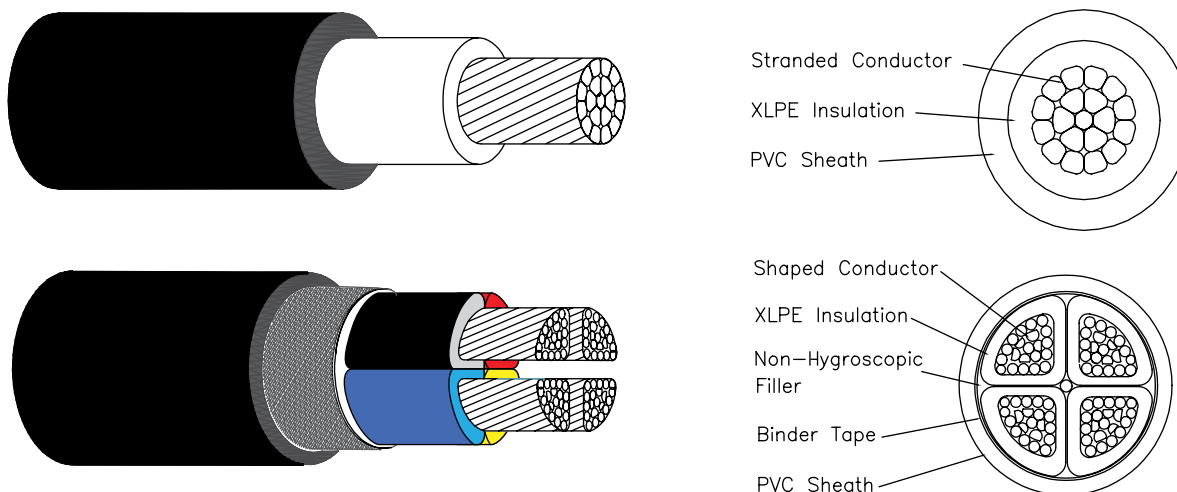
These tests are conducted to ensure major design changes to cables conform to proper performance thresholds.

## **After Installation Tests**

These tests are to determine and ensure that cable installed are in optimum operating conditions. Conductor resistance tests on the completed circuit, verification tests of cross bonded systems and surge divertor tests are among the running lists of such critical test requirements.



# XLPE INSULATED UNARMoured PVC SHEATHED CABLE 0.6 / 1 ( 1.2 ) kV



## DESCRIPTION

Single core and multicore cables with copper or aluminium conductor, XLPE insulated and PVC sheathed. Cables are rated at 0.6 / 1 (1.2) kV and conformed to IEC 60502, MS 2104 & MS 2106.

## CONSTRUCTION

### 1 Conductor

Plain circular, compacted or shaped stranded copper or aluminium conductor, conform to IEC 60228 class 2.

### 2 Insulation

XLPE ( cross-linked polyethylene ) rated at 90°C.

### 3 Colours for core identification

Single core - natural (black on request)  
 Two cores - red, black  
 Three cores - red, yellow and blue  
 Four cores - red, yellow, blue and black  
 Five cores - red, yellow, blue, black and green/yellow

### Optional colours

Single core - natural (brown or blue on request)  
 Two cores - brown, blue  
 Three cores - brown, black, grey  
 Four cores - brown, black, grey, blue  
 Five cores - brown, black, grey, blue and green/yellow

OR

### 4 Assembly

Two, three, four or five insulated conductors are laid up together if necessary filled with non- hygroscopic material compatible with the insulation. The filling may be omitted provided the outer shape of the cables remains practically circular and no adhesion occurs between cores and sheath.

### 5 Sheath

PVC type ST2 to IEC 60502, colour black.

## APPLICATION

These cables are designated for general use including underground burial, where they are not likely to suffer mechanical damage.

Note: Cables complying with BS5467 and customer's specification are available upon request.



**XLPE INSULATED UNARMoured PVC SHEATHED CABLE - SINGLE CORE**  
**CU/XLPE/PVC CABLE**  
**AL/XLPE/PVC CABLE**

0.6 / 1 (1.2) kV

Nominal cross-sectional area	Conductor Shape	Nominal thickness of insulation	Nominal thickness of sheath	Approximate overall diameter	Approximate weight of cable	
					Copper	Aluminium
mm <sup>2</sup>		mm	mm	mm	Kg / Km	Kg / Km
1.5	r.m.	0.7	1.4	5.8	45	-
2.5	r.m.	0.7	1.4	6.2	60	-
4	r.m.	0.7	1.4	6.8	80	-
6	r.m.	0.7	1.4	7.3	100	65
10	r.m.	0.7	1.4	8.3	140	85
16	c.c.	0.7	1.4	9.0	200	100
25	c.c.	0.9	1.4	10.6	310	150
35	c.c.	0.9	1.4	11.8	400	190
50	c.c.	1.0	1.4	13.2	530	230
70	c.c.	1.1	1.4	15.1	740	320
95	c.c.	1.1	1.5	17.0	1000	420
120	c.c.	1.2	1.5	18.8	1250	510
150	c.c.	1.4	1.6	20.8	1560	620
185	c.c.	1.6	1.6	23.0	1900	750
240	c.c.	1.7	1.7	25.8	2470	960
300	c.c.	1.8	1.8	28.5	3090	1190
400	c.c.	2.0	1.9	31.9	3910	1490
500	c.c.	2.2	2.0	35.5	4900	1850
630	c.c.	2.4	2.2	40.0	6270	2350
800	c.c.	2.6	2.3	43.5	7890	2940
1000	r.m.	2.8	2.4	52.0	9880	3690

**XLPE INSULATED UNARMoured PVC SHEATHED CABLE - TWO CORES**  
**CU/XLPE/PVC CABLE**  
**AL/XLPE/PVC CABLE**

0.6 / 1 (1.2) kV

Nominal cross-sectional area	Conductor Shape	Nominal thickness of insulation	Nominal thickness of sheath	Approximate overall diameter	Approximate weight of cable	
					Copper	Aluminium
mm <sup>2</sup>		mm	mm	mm	Kg / Km	Kg / Km
1.5	r.m.	0.7	1.8	9.7	110	-
2.5	r.m.	0.7	1.8	10.5	140	-
4	r.m.	0.7	1.8	11.6	180	-
6	r.m.	0.7	1.8	12.7	240	160
10	r.m.	0.7	1.8	14.6	340	220
16	c.c.	0.7	1.8	16.5	480	280
25	c.c.	0.9	1.8	19.8	710	400
35	c.c.	0.9	1.8	22.1	930	500
50	c.c.	1.0	1.8	24.8	1220	630
70	c.c.	1.1	1.8	28.6	1680	840
95	c.c.	1.1	1.9	32.4	2260	1090
120	c.c.	1.2	2.0	36.0	2830	1340
150	c.c.	1.4	2.2	40.1	3530	1640
185	c.c.	1.6	2.3	44.7	4330	2050
240	c.c.	1.7	2.5	50.3	5620	2620
300	c.c.	1.8	2.6	55.5	6970	3200
400	c.c.	2.0	2.9	62.5	8860	4040

Note : r.m. - circular stranded, c.c. - compacted circular stranded, s.m. - shaped stranded

**XLPE INSULATED UNARMoured PVC SHEATHED CABLE - THREE CORES**  
**CU/XLPE/PVC CABLE**  
**AL/XLPE/PVC CABLE**
**0.6 / 1 (1.2) kV**

Nominal cross-sectional area	Conductor Shape	Nominal thickness of insulation	Nominal thickness of sheath	Approximate overall diameter	Approximate weight of cable	
					Copper	Aluminium
mm <sup>2</sup>		mm	mm	mm	Kg / Km	Kg / Km
1.5	r.m.	0.7	1.8	10.1	130	-
2.5	r.m.	0.7	1.8	11.0	170	-
4	r.m.	0.7	1.8	12.2	230	-
6	r.m.	0.7	1.8	13.4	300	190
10	r.m.	0.7	1.8	15.4	450	260
16	c.c.	0.7	1.8	17.4	630	340
25	c.c.	0.9	1.8	21.0	960	490
35	c.c.	0.9	1.8	23.5	1270	620
50	s.m.	1.0	1.8	24.1	1580	700
70	s.m.	1.1	1.9	27.9	2220	950
95	s.m.	1.1	2.0	31.4	3000	1240
120	s.m.	1.2	2.1	34.8	3750	1530
150	s.m.	1.4	2.3	38.8	4680	1890
185	s.m.	1.6	2.4	43.2	5760	2340
240	s.m.	1.7	2.6	48.6	7490	2990
300	s.m.	1.8	2.7	53.4	9320	3650
400	s.m.	2.0	3.0	60.1	11860	4630

**XLPE INSULATED UNARMoured PVC SHEATHED CABLE - FOUR CORES**  
**CU/XLPE/PVC CABLE**  
**AL/XLPE/PVC CABLE**
**0.6 / 1 (1.2) kV**

Nominal cross-sectional area	Conductor Shape	Nominal thickness of insulation	Nominal thickness of sheath	Approximate overall diameter	Approximate weight of cable	
					Copper	Aluminium
mm <sup>2</sup>		mm	mm	mm	Kg / Km	Kg / Km
1.5	r.m.	0.7	1.8	10.9	160	-
2.5	r.m.	0.7	1.8	11.9	210	-
4	r.m.	0.7	1.8	13.2	280	-
6	r.m.	0.7	1.8	14.6	380	230
10	r.m.	0.7	1.8	16.9	570	320
16	c.c.	0.7	1.8	19.0	810	420
25	c.c.	0.9	1.8	23.0	1240	610
35	c.c.	0.9	1.8	25.8	1640	780
50	s.m.	1.0	1.8	27.1	2110	920
70	s.m.	1.1	2.0	31.6	2980	1280
95	s.m.	1.1	2.1	35.7	4020	1660
120	s.m.	1.2	2.3	39.8	5050	2070
150	s.m.	1.4	2.4	44.1	6280	2540
185	s.m.	1.6	2.6	49.3	7760	3170
240	s.m.	1.7	2.8	55.4	10080	4040
300	s.m.	1.8	3.0	61.3	12560	4980
400	s.m.	2.0	3.3	68.9	15940	6300

Note : r.m. - circular stranded, c.c. - compacted circular stranded, s.m. - shaped stranded

**XLPE INSULATED UNARMoured PVC SHEATHED CABLE  
- FOUR CORES WITH REDUCED NEUTRAL  
CU/XLPE/PVC CABLE  
AL/XLPE/PVC CABLE**

0.6 / 1 (1.2) kV

Phase		Neutral		Phase	Neutral	Nominal thickness of sheath	Approximate overall diameter	Approximate weight of cable	
Nominal cross-sectional area	Conductor Shape	Nominal cross-sectional area	Conductor Shape	Nominal Thickness of insulation				Copper	Aluminium
				mm <sup>2</sup>	mm	mm	Kg / Km		
25	c.c.	16	c.c.	0.9	0.7	1.8	22.2	1130	570
35	c.c.	16	c.c.	0.9	0.7	1.8	24.3	1440	700
50	s.m.	25	c.c.	1.0	0.9	1.8	27.1	1890	870
70	s.m.	35	c.c.	1.1	0.9	2.0	31.4	2640	1190
95	s.m.	50	c.c.	1.1	1.0	2.1	35.7	3570	1560
120	s.m.	70	c.c.	1.2	1.1	2.3	39.6	4540	1940
150	s.m.	70	c.c.	1.4	1.1	2.4	43.9	5480	2340
185	s.m.	95	c.c.	1.6	1.1	2.6	49.1	6860	2940
240	s.m.	120	c.c.	1.7	1.2	2.8	55.0	8840	3720
300	s.m.	150	c.c.	1.8	1.4	3.0	60.9	11020	4590
400	s.m.	185	c.c.	2.0	1.6	3.3	68.5	13960	5800

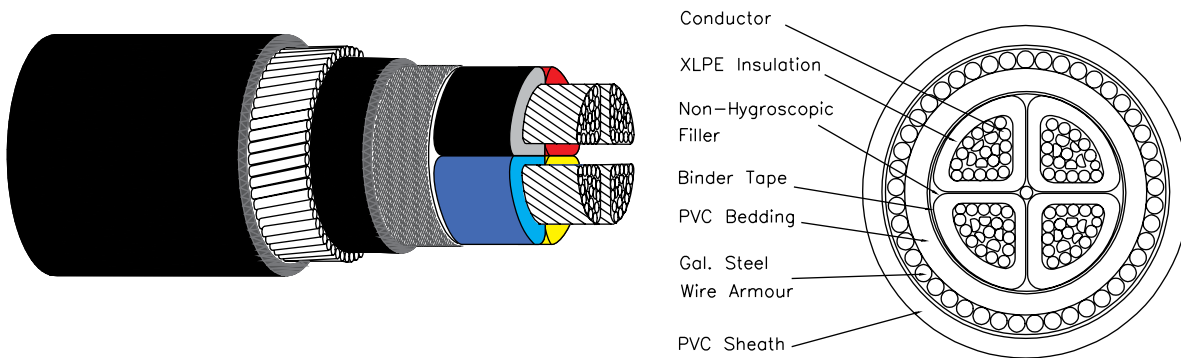
**XLPE INSULATED UNARMoured PVC SHEATHED CABLE - FIVE CORES  
CU/XLPE/PVC CABLE  
AL/XLPE/PVC CABLE**

0.6 / 1 (1.2) kV

Nominal cross-sectional area	Conductor Shape	Nominal thickness of insulation	Nominal thickness of sheath	Approximate overall diameter	Approximate weight of cable	
					Copper	Aluminium
mm <sup>2</sup>		mm	mm	mm	Kg / Km	Kg / Km
1.5	r.m.	0.7	1.8	11.8	190	-
2.5	r.m.	0.7	1.8	12.9	240	-
4	r.m.	0.7	1.8	14.4	340	-
6	r.m.	0.7	1.8	15.9	450	260
10	r.m.	0.7	1.8	18.4	670	360
16	c.c.	0.7	1.8	20.8	1000	510
25	c.c.	0.9	1.8	25.2	1530	750
35	c.c.	0.9	1.8	28.4	2040	960
50	c.c.	1.0	1.9	32.3	2710	1230
70	c.c.	1.1	2.1	37.8	3800	1690
95	c.c.	1.1	2.2	42.8	5140	2210

Note : r.m. - circular stranded, c.c. - compacted circular stranded, s.m. - shaped stranded

# XLPE INSULATED ARMoured PVC SHEATHED CABLE 0.6 / 1 (1.2) kV



## DESCRIPTION

Single core and multicore cables with copper or aluminium conductor, XLPE insulated, armoured and PVC sheathed. Cables are rated at 0.6 / 1 (1.2) kV and conformed to IEC 60502, MS 2105 & MS 2107.

## CONSTRUCTION

### 1 Conductor

Plain circular, compacted or shaped stranded copper or aluminium conductor, conform to IEC 60228 class 2.

### 2 Insulation

XLPE ( cross-linked polyethylene ) rated at 90 °C.

### 3 Colours for core identification

Single core - natural (black on request)  
Two cores - red, black  
Three cores - red, yellow and blue  
Four cores - red, yellow, blue and black  
Five cores - red, yellow, blue, black and green/yellow

### Optional colours

Single core - natural (brown or blue on request)  
OR Two cores - brown, blue  
Three cores - brown, black, grey  
Four cores - brown, black, grey, blue  
Five cores - brown, black, grey, blue and green/yellow

### 4 Assembly

Two, three, four or five insulated conductors are laid up together, if necessary filled with non- hygroscopic material compatible with the insulation and covered with a layer of PVC bedding which may be an integral part of the filling.

### 5 Armour

Single Core - Aluminium wire shall be applied over the PVC bedding.  
Multicore - Galvanized steel wire shall be applied over the PVC bedding.

### 6 Sheath

PVC type ST2 to IEC 60502 colour black.

## APPLICATION

These cables are most suitable for underground burial where there is a risk of mechanical damage.

Note : Cables complying with BS5467 and customer's specification are available upon request.

**XLPE INSULATED ARMoured PVC SHEATHED CABLE - SINGLE CORE**  
**CU/XLPE/PVC/AWA/PVC CABLE**  
**AL/XLPE/PVC/AWA/PVC CABLE**

0.6 / 1 (1.2) kV

Nominal cross-sectional area	Conductor Shape	Nominal thickness of insulation	Nominal diameter of aluminium wire	Nominal thickness of sheath	Approximate overall diameter	Approximate weight of cable	
						Copper	Aluminium
mm <sup>2</sup>		mm	mm	mm	mm	Kg / Km	Kg / Km
16	c.c.	0.7	0.9	1.8	13.6	350	250
25	c.c.	0.9	0.9	1.8	15.2	470	310
35	c.c.	0.9	0.9	1.8	16.4	590	370
50	c.c.	1.0	1.25	1.8	18.5	770	480
70	c.c.	1.1	1.25	1.8	20.4	1010	580
95	c.c.	1.1	1.25	1.8	22.1	1290	700
120	c.c.	1.2	1.6	1.8	24.6	1630	880
150	c.c.	1.4	1.6	1.8	26.4	1950	1010
185	c.c.	1.6	1.6	1.8	28.6	2340	1180
240	c.c.	1.7	1.6	1.9	31.4	2950	1430
300	c.c.	1.8	1.6	1.9	33.9	3600	1690
400	c.c.	2.0	2.0	2.1	39.2	4610	2170
500	c.c.	2.2	2.0	2.2	42.8	5670	2600
630	c.c.	2.4	2.0	2.3	47.1	7110	3180
800	c.c.	2.6	2.5	2.5	52.2	9020	4070
1000	r.m.	2.8	2.5	2.7	60.9	11260	5070

**XLPE INSULATED ARMoured PVC SHEATHED CABLE - TWO CORES**  
**CU/XLPE/PVC/SWA/PVC CABLE**  
**AL/XLPE/PVC/SWA/PVC CABLE**

0.6 / 1 (1.2) kV

Nominal cross-sectional area	Conductor Shape	Nominal thickness of insulation	Nominal diameter of steel wire	Nominal thickness of sheath	Approximate overall diameter	Approximate weight of cable	
						Copper	Aluminium
mm <sup>2</sup>		mm	mm	mm	mm	Kg / Km	Kg / Km
1.5	r.m.	0.7	0.9	1.8	13.5	340	-
2.5	r.m.	0.7	0.9	1.8	14.3	380	-
4	r.m.	0.7	0.9	1.8	15.4	460	-
6	r.m.	0.7	0.9	1.8	16.5	530	450
10	r.m.	0.7	1.25	1.8	19.1	780	660
16	c.c.	0.7	1.25	1.8	21.0	970	770
25	c.c.	0.9	1.6	1.8	25.0	1440	1120
35	c.c.	0.9	1.6	1.8	27.3	1760	1300
50	c.c.	1.0	1.6	1.8	30.0	2120	1530
70	c.c.	1.1	1.6	2.0	34.2	2760	1910
95	c.c.	1.1	2.0	2.1	39.2	3790	2600
120	c.c.	1.2	2.0	2.2	42.8	4510	3020
150	c.c.	1.4	2.0	2.3	46.7	5350	3430
185	c.c.	1.6	2.5	2.5	53.7	6870	4500
240	c.c.	1.7	2.5	2.7	59.3	8450	5320
300	c.c.	1.8	2.5	2.8	64.9	10150	6220
400	c.c.	2.0	2.5	3.1	71.9	12390	7410
500	c.c.	2.2	3.15	3.3	78.9	15730	9660

Note : r.m. - circular stranded, c.c. - compacted circular stranded, s.m. - shaped stranded

**XLPE INSULATED ARMoured PVC SHEATHED CABLE - THREE CORES**  
**CU/XLPE/PVC/SWA/PVC CABLE**  
**AL/XLPE/PVC/SWA/PVC CABLE**
**0.6 / 1 (1.2) kV**

Nominal cross-sectional area	Conductor Shape	Nominal thickness of insulation	Nominal diameter of steel wire	Nominal thickness of sheath	Approximate overall diameter	Approximate weight of cable	
						Copper	Aluminium
mm <sup>2</sup>		mm	mm	mm	mm	Kg / Km	Kg / Km
1.5	r.m.	0.7	0.9	1.8	13.9	370	-
2.5	r.m.	0.7	0.9	1.8	14.8	430	-
4	r.m.	0.7	0.9	1.8	16.0	510	-
6	r.m.	0.7	0.9	1.8	17.2	610	500
10	r.m.	0.7	1.25	1.8	19.9	910	730
16	c.c.	0.7	1.25	1.8	21.9	1150	860
25	c.c.	0.9	1.6	1.8	26.2	1740	1260
35	c.c.	0.9	1.6	1.8	28.7	2130	1460
50	s.m.	1.0	1.6	1.9	29.5	2480	1600
70	s.m.	1.1	2.0	2.0	34.5	3540	2270
95	s.m.	1.1	2.0	2.2	38.2	4460	2700
120	s.m.	1.2	2.0	2.3	41.6	5380	3150
150	s.m.	1.4	2.5	2.5	48.0	6890	4100
185	s.m.	1.6	2.5	2.6	52.4	8210	4790
240	s.m.	1.7	2.5	2.8	58.2	10290	5780
300	s.m.	1.8	2.5	3.0	63.2	12390	6720
400	s.m.	2.0	2.5	3.2	69.7	15250	8020
500	c.c.	2.2	3.15	3.5	84.5	20660	11550

**XLPE INSULATED ARMoured PVC SHEATHED CABLE - FOUR CORES**  
**CU/XLPE/PVC/SWA/PVC CABLE**  
**AL/XLPE/PVC/SWA/PVC CABLE**
**0.6 / 1 (1.2) kV**

Nominal cross-sectional area	Conductor Shape	Nominal thickness of insulation	Nominal diameter of steel wire	Nominal thickness of sheath	Approximate overall diameter	Approximate weight of cable	
						Copper	Aluminium
mm <sup>2</sup>		mm	mm	mm	mm	Kg / Km	Kg / Km
1.5	r.m.	0.7	0.9	1.8	14.7	410	-
2.5	r.m.	0.7	0.9	1.8	15.7	480	-
4	r.m.	0.7	0.9	1.8	17.0	580	-
6	r.m.	0.7	1.25	1.8	19.1	820	680
10	r.m.	0.7	1.25	1.8	21.4	1070	820
16	c.c.	0.7	1.6	1.8	24.2	1520	1120
25	c.c.	0.9	1.6	1.8	28.2	2080	1460
35	c.c.	0.9	1.6	1.9	31.2	2600	1730
50	s.m.	1.0	1.6	2.0	32.7	3130	1940
70	s.m.	1.1	2.0	2.2	38.4	4480	2770
95	s.m.	1.1	2.0	2.3	42.5	5680	3320
120	s.m.	1.2	2.5	2.5	48.8	7310	4330
150	s.m.	1.4	2.5	2.6	53.1	8780	5040
185	s.m.	1.6	2.5	2.8	58.3	10510	5910
240	s.m.	1.7	2.5	3.0	64.8	13220	7180
300	s.m.	1.8	2.5	3.2	70.7	16000	8420
400	s.m.	2.0	3.15	3.5	80.3	20750	11110
500	c.c.	2.2	3.15	3.8	93.0	26130	14060

Note : r.m. - circular stranded, c.c. - compacted circular stranded, s.m. - shaped stranded

**XLPE INSULATED ARMoured PVC SHEATHED CABLE  
- FOUR CORES WITH REDUCED NEUTRAL  
CU/XLPE/PVC/SWA/PVC CABLE  
AL/XLPE/PVC/SWA/PVC CABLE**

0.6 / 1 (1.2) kV

Phase		Neutral		Phase	Neutral	Nominal diameter of steel wire	Nominal thickness of sheath	Approximate overall diameter	Approximate weight of cable	
Nominal cross-sectional area	Conductor Shape	Nominal cross-sectional area	Conductor Shape	Nominal Thickness of insulation					Copper	Aluminium
				mm	mm					
25	c.c.	16	c.c.	0.9	0.7	1.6	1.8	27.4	1950	1390
35	c.c.	16	c.c.	0.9	0.7	1.6	1.9	29.5	2320	1580
50	s.m.	25	c.c.	1.0	0.9	1.6	2.0	32.5	2890	1850
70	s.m.	35	c.c.	1.1	0.9	2.0	2.2	38.2	4130	2640
95	s.m.	50	c.c.	1.1	1.0	2.0	2.3	42.3	5200	3150
120	s.m.	70	c.c.	1.2	1.1	2.5	2.5	46.4	6360	3720
150	s.m.	70	c.c.	1.4	1.1	2.5	2.6	52.9	7970	4760
185	s.m.	95	c.c.	1.6	1.1	2.5	2.8	58.1	9600	5590
240	s.m.	120	c.c.	1.7	1.2	2.5	3.0	64.6	12000	6750
300	s.m.	150	c.c.	1.8	1.4	2.5	3.2	70.3	14450	7860
400	s.m.	185	c.c.	2.0	1.6	3.15	3.5	79.5	18690	9720

**XLPE INSULATED ARMoured PVC SHEATHED CABLE - FIVE CORES  
CU/XLPE/PVC/SWA/PVC CABLE  
AL/XLPE/PVC/SWA/PVC CABLE**

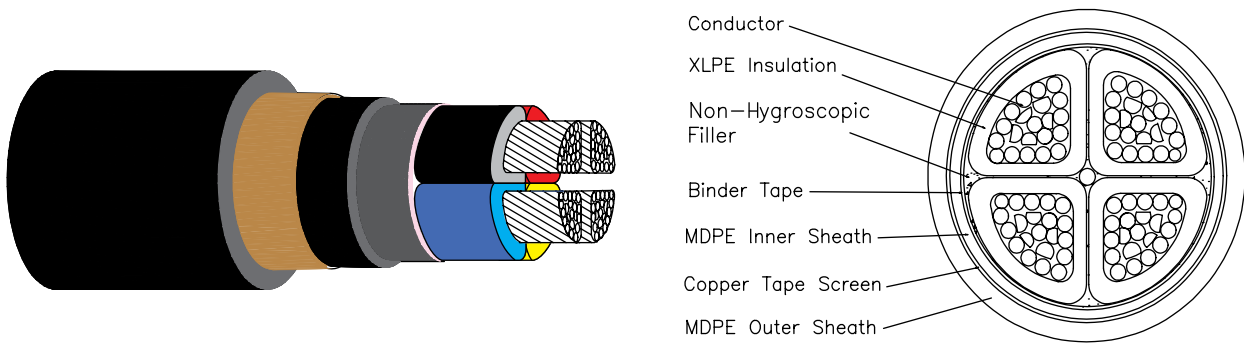
0.6 / 1 (1.2) kV

Nominal cross-sectional area	Conductor Shape	Nominal thickness of insulation	Nominal diameter of steel wire	Nominal thickness of sheath	Approximate overall diameter	Approximate weight of cable	
						Copper	Aluminium
mm <sup>2</sup>		mm	mm	mm	mm	Kg / Km	Kg / Km
1.5	r.m.	0.7	0.9	1.8	15.6	450	-
2.5	r.m.	0.7	0.9	1.8	16.7	540	-
4	r.m.	0.7	1.25	1.8	18.9	770	-
6	r.m.	0.7	1.25	1.8	20.4	930	740
10	r.m.	0.7	1.25	1.8	22.9	1220	910
16	c.c.	0.7	1.6	1.8	26.0	1770	1280
25	c.c.	0.9	1.6	1.8	30.4	2450	1670
35	c.c.	0.9	1.6	1.9	33.8	3100	2020
50	c.c.	1.0	2.0	2.1	39.1	4230	2760
70	c.c.	1.1	2.0	2.3	44.6	5550	3440
95	c.c.	1.1	2.5	2.4	51.8	7580	4650

Note : r.m. - circular stranded, c.c. - compacted circular stranded, s.m. - shaped stranded

# XLPE INSULATED, PE INNER SHEATH, SCREENED AND PE SHEATHED UNDERGROUND CABLE

## 0.6 / 1 (1.2) kV



### DESCRIPTION

Circular compacted and shaped stranded aluminium conductor, XLPE insulated, four cores assembled together with non-hygroscopic filler, extruded with PE inner sheath, copper tape screened and followed by an extruded PE outer sheath. Cables are rated at 0.6/1 (1.2) kV and conformed to IEC 60502.

### CONSTRUCTION

#### 1 Conductor

Plain compacted or shaped stranded aluminium conductor, conform to IEC 60228 class 2.

#### 2 Insulation

XLPE (cross-linked polyethylene) rated at 90 °C.

#### 3 Colours for core identification

Four cores - red, yellow, blue, and black

OR

#### Optional colours

Four cores - brown, black, grey, blue

#### 4 Assembly

Four insulated conductors are laid up together, if necessary filled with non-hygroscopic material compatible with the insulation and inner sheath materials.

#### 5 Inner Sheath

Medium density polyethylene (MDPE).

#### 6 Metallic Screen

Copper tape screen (SCT).

#### 7 Sheath

Medium density polyethylene (MDPE).

### APPLICATION

These cables are designated for general use including underground burial, where they are not likely to suffer mechanical damage.

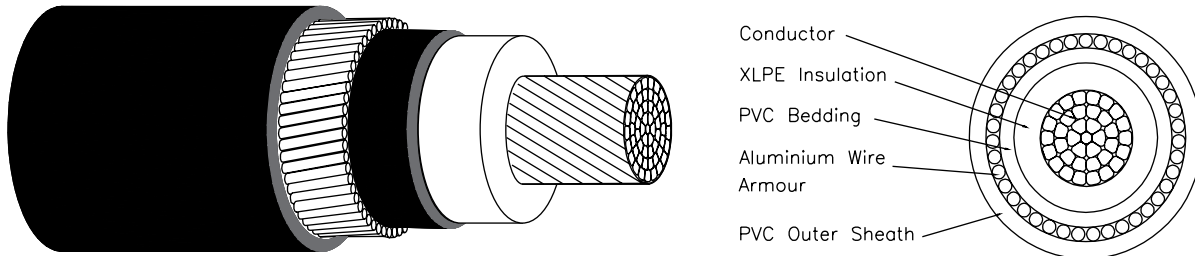


**XLPE INSULATED SCREENED PE SHEATHED CABLE - FOUR CORES  
AL/XLPE/MDPE/SCT/MDPE CABLE ( WITH COPPER TAPE SCREENED )**
**0.6 / 1 (1.2) kV**

Nominal cross-sectional area	Conductor Shape	Nominal thickness of insulation	Nominal thickness of PE inner sheath	Metallic Screening	Nominal thickness of PE outer sheath	Approximate overall diameter	Approximate weight of cable
				Approximate thickness of copper tape			Aluminium
mm <sup>2</sup>		mm	mm	mm	mm	mm	kg/mm
16	c.c.	0.7	1.0	0.2	1.8	21.4	538
25	c.c.	0.9	1.0	0.2	1.8	25.4	758
35	c.c.	0.9	1.0	0.2	1.8	28.1	943
50	s.m.	1.0	1.0	0.2	1.9	30.2	1139
70	s.m.	1.1	1.2	0.2	2.0	34.9	1532
95	s.m.	1.1	1.2	0.2	2.2	39.2	1960
120	s.m.	1.2	1.4	0.2	2.3	43.5	2417
150	s.m.	1.4	1.4	0.2	2.5	48.0	2923
185	s.m.	1.6	1.4	0.2	2.6	53.0	3575
240	s.m.	1.7	1.6	0.2	2.8	59.5	4534
300	s.m.	1.8	1.6	0.2	3.0	65.4	5516
400	s.m.	2.0	1.8	0.2	3.3	73.4	6945

Note : c.c. - compacted circular stranded, s.m. - shaped stranded

# XLPE INSULATED ARMoured PVC SHEATHED CABLE 1.9 / 3.3 (3.6) kV



## DESCRIPTION

Single core and multicore cables with copper or aluminium conductor, XLPE insulated, armoured and PVC sheathed. Cables are rated at 1.9 / 3.3 (3.6) kV and conformed to IEC 60502.

## CONSTRUCTION

### 1 Conductor

Plain circular, compacted stranded copper or aluminium conductor, conform to IEC 60228 class 2.

### 2 Insulation

XLPE (cross-linked polyethylene) rated at 90 °C.

### 3 Colours for core identification

Single core - natural  
Three cores - red, yellow, and blue

OR

### Optional colours

Single core - natural  
Three cores - brown, black and grey

### 4 Assembly

Three insulated conductors are laid up together, if necessary, filled with non-hygroscopic material compatible with the insulation and covered with layer of PVC bedding which may be an integral part of the filling.

### 5 Armour

Single Core - Aluminium wire shall be applied over the PVC bedding.  
Multicore - Galvanized steel wire shall be applied over the PVC bedding.

### 6 Sheath

PVC type ST2 to IEC 60502 colour black.

## APPLICATION

These cables are most suitable for underground burial where there is a risk of mechanical damage.

Note : Cables complying with BS5467 and customer's specification are available upon request.

**XLPE INSULATED ARMoured PVC SHEATHED CABLE - SINGLE CORE**  
**CU/XLPE/PVC/AWA/PVC CABLE**  
**AL/XLPE/PVC/AWA/PVC CABLE**

1.9 / 3.3 (3.6) kV

Nominal cross-sectional area	Conductor Shape	Nominal thickness of insulation	Nominal diameter of aluminium wire	Nominal thickness of sheath	Approximate overall diameter	Approximate weight of cable	
						Copper	Aluminium
mm <sup>2</sup>		mm	mm	mm	mm	Kg / Km	Kg / Km
10	r.m.	2.0	0.9	1.8	15.5	367	304
16	c.c.	2.0	0.9	1.8	16.2	439	339
25	c.c.	2.0	1.25	1.8	18.1	598	439
35	c.c.	2.0	1.25	1.8	19.3	720	499
50	c.c.	2.0	1.25	1.8	20.5	867	568
70	c.c.	2.0	1.25	1.8	22.2	1108	676
95	c.c.	2.0	1.6	1.8	24.8	1445	846
120	c.c.	2.0	1.6	1.8	26.2	1714	958
150	c.c.	2.0	1.6	1.8	27.6	2008	1079
185	c.c.	2.0	1.6	1.8	29.4	2404	1238
240	c.c.	2.0	1.6	1.9	31.9	3037	1490
300	c.c.	2.0	1.6	2.0	34.3	3691	1750
400	c.c.	2.0	2.0	2.1	38.4	4708	2226
500	c.c.	2.2	2.0	2.2	41.9	5788	2659
630	c.c.	2.4	2.0	2.3	46.1	7311	3251
800	c.c.	2.6	2.5	2.5	52.2	9390	4197
1000	r.m.	2.8	2.5	2.7	60.9	11799	5252

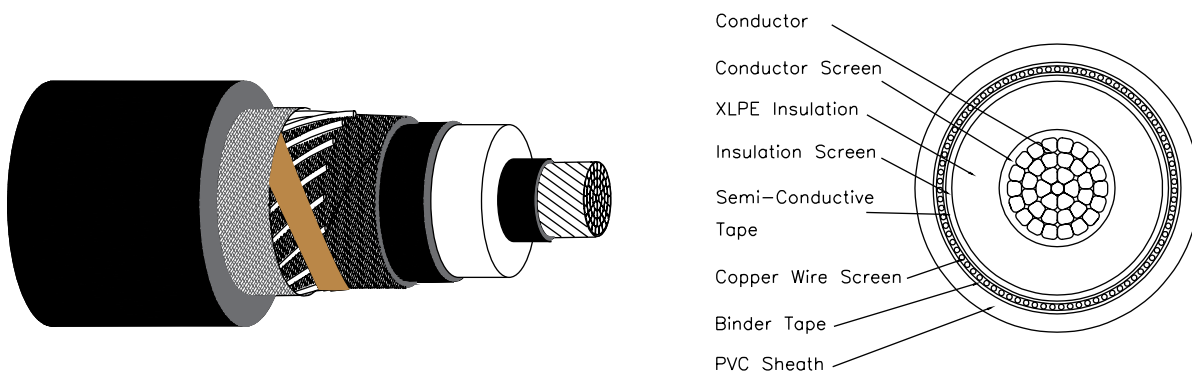
**XLPE INSULATED ARMoured PVC SHEATHED CABLE - THREE CORES**  
**CU/XLPE/PVC/SWA/PVC CABLE**  
**AL/XLPE/PVC/SWA/PVC CABLE**

1.9 / 3.3 (3.6) kV

Nominal cross-sectional area	Conductor Shape	Nominal thickness of insulation	Nominal diameter of steel wire	Nominal thickness of sheath	Approximate overall diameter	Approximate weight of cable	
						Copper	Aluminium
mm <sup>2</sup>		mm	mm	mm	mm	Kg / Km	Kg / Km
10	r.m.	2.0	1.6	1.8	26.2	1418	1224
16	c.c.	2.0	1.6	1.8	27.8	1678	1371
25	c.c.	2.0	1.6	1.9	30.7	2116	1629
35	c.c.	2.0	1.6	1.9	33.2	2540	1865
50	c.c.	2.0	2.0	2.1	37.8	3422	2508
70	c.c.	2.0	2.0	2.2	41.6	4293	2972
95	c.c.	2.0	2.0	2.3	44.8	5273	3441
120	c.c.	2.0	2.5	2.4	50.6	6731	4416
150	c.c.	2.0	2.5	2.5	53.8	7768	4924
185	c.c.	2.0	2.5	2.7	57.9	9192	5625
240	c.c.	2.0	2.5	2.8	63.6	11472	6738
300	c.c.	2.0	2.5	3.0	68.8	13711	7773
400	c.c.	2.0	2.5	3.2	75.0	16756	9161

Note : r.m. - circular stranded, c.c. - compacted circular stranded

# SINGLE CORE - XLPE INSULATED UNARMoured PVC SHEATHED CABLE FOR VOLTAGES 6.6 kV UP TO AND INCLUDING 33kV TO IEC 60502



## DESCRIPTION

Circular compacted stranded copper or aluminium conductor, XLPE insulated, with copper wire or copper tape screened and PVC outer sheath.

## CONSTRUCTION

### 1 Conductor

Plain circular compacted stranded copper or aluminium conductor to IEC 60228 class 2.

### 2 Conductor Screen

Extruded layer of semiconductive compound.

### 3 Insulation

XLPE (cross-linked polyethylene) rated at 90 °C.

### 4 Insulation Screen

#### a Non-metallic part

Extruded layer of semiconductive compound.

#### b Metallic part

Copper wire screen (SCW) or Copper tape screen (SCT).

### 5 Outer Sheath

PVC type ST2 to IEC 60502 colour black.

## APPLICATION

For installation on trays, ducts or direct burial.

Note : Cables complying with BS 6622 and customer's specification are available upon request.

: PE outer sheath is available upon request.

**XLPE INSULATED UNARMoured PVC SHEATHED CABLE - SINGLE CORE  
CU/XLPE/SCW/PVC CABLE ( WITH COPPER WIRE SCREENED )  
AL/XLPE/SCW/PVC CABLE ( WITH COPPER WIRE SCREENED )**

3.8 / 6.6 (7.2) kV

Nominal cross-sectional area of conductor	Nominal diameter of conductor	Nominal thickness of XLPE insulation	Nominal cross-sectional area of metallic screen	Nominal thickness of PVC sheath	Approximate overall diameter of cable	Approximate weight of cable	
						Copper	Aluminium
mm <sup>2</sup>	mm	mm	mm <sup>2</sup>	mm	mm	Kg / Km	Kg / Km
50	8.1	3.0	16	1.6	22	933	635
70	9.7	3.0	16	1.7	24	1174	743
95	11.5	3.0	16	1.7	26	1456	858
120	12.9	3.0	16	1.8	28	1729	973
150	14.3	3.0	25	1.8	29	2095	1167
185	16.1	3.0	25	1.9	31	2492	1328
240	18.4	3.0	25	2.0	34	3113	1567
300	20.6	3.0	25	2.0	36	3735	1796
400	23.3	3.0	35	2.2	39	4712	2232
500	26.2	3.2	35	2.3	42	5765	2638
630	29.8	3.2	35	2.4	46	7231	3158
800	33.7	3.2	50	2.5	50	9128	3940

**XLPE INSULATED UNARMoured PVC SHEATHED CABLE - SINGLE CORE  
CU/XLPE/SCT/PVC CABLE ( WITH COPPER TAPE SCREENED )  
AL/XLPE/SCT/PVC CABLE ( WITH COPPER TAPE SCREENED )**

3.8 / 6.6 (7.2) kV

Nominal cross-sectional area of conductor	Nominal diameter of conductor	Nominal thickness of XLPE insulation	Metallic Screening		Nominal thickness of PVC sheath	Approximate overall diameter of cable	Approximate weight of cable	
			Approximate thickness of copper tape				Copper	Aluminium
mm <sup>2</sup>	mm	mm	mm		mm	mm	Kg / Km	Kg / Km
50	8.1	3.0	0.1		1.6	20	805	506
70	9.7	3.0	0.1		1.7	22	1049	618
95	11.5	3.0	0.1		1.7	24	1335	737
120	12.9	3.0	0.1		1.8	25	1610	855
150	14.3	3.0	0.1		1.8	27	1897	968
185	16.1	3.0	0.1		1.9	29	2297	1132
240	18.4	3.0	0.1		2.0	31	2922	1376
300	20.6	3.0	0.1		2.0	34	3550	1611
400	23.3	3.0	0.1		2.1	36	4422	1942
500	26.2	3.2	0.1		2.2	40	5479	2353
630	29.8	3.2	0.1		2.3	44	6953	2897
800	33.7	3.2	0.1		2.5	49	8741	3553

**XLPE INSULATED UNARMoured PVC SHEATHED CABLE - SINGLE CORE  
 CU/XLPE/SCW/PVC CABLE ( WITH COPPER WIRE SCREENED )  
 AL/XLPE/SCW/PVC CABLE ( WITH COPPER WIRE SCREENED )**

**6.35 / 11 (12) kV**

Nominal cross-sectional area of conductor	Nominal diameter of conductor	Nominal thickness of XLPE insulation	Nominal cross-sectional area of metallic screen	Nominal thickness of PVC sheath	Approximate overall diameter of cable	Approximate weight of cable	
						Copper	Aluminium
mm <sup>2</sup>	mm	mm	mm <sup>2</sup>	mm	mm	Kg / Km	Kg / Km
50	8.1	3.4	16	1.7	23	972	673
70	9.7	3.4	16	1.7	25	1204	773
95	11.5	3.4	16	1.8	27	1501	903
120	12.9	3.4	16	1.8	28	1763	1007
150	14.3	3.4	25	1.9	30	2145	1217
185	16.1	3.4	25	1.9	32	2530	1366
240	18.4	3.4	25	2.0	34	3153	1608
300	20.6	3.4	25	2.1	37	3796	1857
400	23.3	3.4	35	2.2	40	4760	2280
500	26.2	3.4	35	2.3	43	5790	2664
630	29.8	3.4	35	2.4	47	7259	3203
800	33.7	3.4	50	2.5	51	9159	3971

**XLPE INSULATED UNARMoured PVC SHEATHED CABLE - SINGLE CORE  
 CU/XLPE/SCT/PVC CABLE ( WITH COPPER TAPE SCREENED )  
 AL/XLPE/SCT/PVC CABLE ( WITH COPPER TAPE SCREENED )**

**6.35 / 11 (12) kV**

Nominal cross-sectional area of conductor	Nominal diameter of conductor	Nominal thickness of XLPE insulation	Metallic Screening	Nominal thickness of PVC sheath	Approximate overall diameter of cable	Approximate weight of cable	
			Approximate thickness of copper tape			Copper	Aluminium
mm <sup>2</sup>	mm	mm	mm	mm	mm	Kg / Km	Kg / Km
50	8.1	3.4	0.1	1.6	21	834	536
70	9.7	3.4	0.1	1.7	23	1081	649
95	11.5	3.4	0.1	1.8	25	1380	782
120	12.9	3.4	0.1	1.8	26	1646	890
150	14.3	3.4	0.1	1.9	28	1947	1019
185	16.1	3.4	0.1	1.9	29	2337	1172
240	18.4	3.4	0.1	2.0	32	2965	1419
300	20.6	3.4	0.1	2.1	34	3612	1673
400	23.3	3.4	0.1	2.2	37	4488	2008
500	26.2	3.4	0.1	2.3	40	5525	2399
630	29.8	3.4	0.1	2.4	45	7003	2947
800	33.7	3.4	0.1	2.5	49	8773	3585

**XLPE INSULATED UNARMoured PVC SHEATHED CABLE - SINGLE CORE  
CU/XLPE/SCW/PVC CABLE ( WITH COPPER WIRE SCREENED )  
AL/XLPE/SCW/PVC CABLE ( WITH COPPER WIRE SCREENED )**

8.7 / 15 (17.5) kV

Nominal cross-sectional area of conductor	Nominal diameter of conductor	Nominal thickness of XLPE insulation	Nominal cross-sectional area of metallic screen	Nominal thickness of PVC sheath	Approximate overall diameter of cable	Approximate weight of cable	
						Copper	Aluminium
mm <sup>2</sup>	mm	mm	mm <sup>2</sup>	mm	mm	Kg / Km	Kg / Km
50	8.1	4.5	16	1.7	26	1053	754
70	9.7	4.5	16	1.8	27	1303	872
95	11.5	4.5	16	1.8	29	1593	995
120	12.9	4.5	16	1.9	31	1875	1119
150	14.3	4.5	25	1.9	32	2248	1320
185	16.1	4.5	25	2.0	34	2655	1490
240	18.4	4.5	25	2.1	37	3288	1742
300	20.6	4.5	25	2.1	39	3921	1982
400	23.3	4.5	35	2.3	42	4914	2435
500	26.2	4.5	35	2.4	45	5957	2830
630	29.8	4.5	35	2.5	50	7442	3386
800	33.7	4.5	50	2.6	54	9357	4169

**XLPE INSULATED UNARMoured PVC SHEATHED CABLE - SINGLE CORE  
CU/XLPE/SCT/PVC CABLE ( WITH COPPER TAPE SCREENED )  
AL/XLPE/SCT/PVC CABLE ( WITH COPPER TAPE SCREENED )**

8.7 / 15 (17.5) kV

Nominal cross-sectional area of conductor	Nominal diameter of conductor	Nominal thickness of XLPE insulation	Metallic Screening	Nominal thickness of PVC sheath	Approximate overall diameter of cable	Approximate weight of cable	
			Approximate thickness of copper tape			Copper	Aluminium
mm <sup>2</sup>	mm	mm	mm	mm	mm	Kg / Km	Kg / Km
50	8.1	4.5	0.1	1.7	23	931	632
70	9.7	4.5	0.1	1.8	25	1184	753
95	11.5	4.5	0.1	1.8	27	1479	881
120	12.9	4.5	0.1	1.9	29	1763	1007
150	14.3	4.5	0.1	1.9	30	2056	1127
185	16.1	4.5	0.1	2.0	32	2466	1301
240	18.4	4.5	0.1	2.1	34	3104	1558
300	20.6	4.5	0.1	2.1	37	3742	1803
400	23.3	4.5	0.1	2.2	40	4629	2149
500	26.2	4.5	0.1	2.3	43	5676	2549
630	29.8	4.5	0.1	2.4	47	7168	3112
800	33.7	4.5	0.1	2.6	51	8976	3787

**XLPE INSULATED UNARMoured PVC SHEATHED CABLE - SINGLE CORE  
 CU/XLPE/SCW/PVC CABLE ( WITH COPPER WIRE SCREENED )  
 AL/XLPE/SCW/PVC CABLE ( WITH COPPER WIRE SCREENED )**

**12.7 / 22 (24) kV**

Nominal cross-sectional area of conductor	Nominal diameter of conductor	Nominal thickness of XLPE insulation	Nominal cross-sectional area of metallic screen	Nominal thickness of PVC sheath	Approximate overall diameter of cable	Approximate weight of cable	
						Copper	Aluminium
mm <sup>2</sup>	mm	mm	mm <sup>2</sup>	mm	mm	Kg / Km	Kg / Km
50	8.1	5.5	16	1.8	28	1146	847
70	9.7	5.5	16	1.9	30	1403	972
95	11.5	5.5	16	1.9	31	1699	1101
120	12.9	5.5	16	2.0	33	1986	1231
150	14.3	5.5	25	2.0	34	2364	1436
185	16.1	5.5	25	2.1	36	2778	1613
240	18.4	5.5	25	2.1	39	3402	1856
300	20.6	5.5	25	2.2	41	4060	2122
400	23.3	5.5	35	2.3	44	5044	2564
500	26.2	5.5	35	2.4	47	6096	2969
630	29.8	5.5	35	2.5	52	7594	3538
800	33.7	5.5	50	2.7	56	9548	4360

**XLPE INSULATED UNARMoured PVC SHEATHED CABLE - SINGLE CORE  
 CU/XLPE/SCT/PVC CABLE ( WITH COPPER TAPE SCREENED )  
 AL/XLPE/SCT/PVC CABLE ( WITH COPPER TAPE SCREENED )**

**12.7 / 22 (24) kV**

Nominal cross-sectional area of conductor	Nominal diameter of conductor	Nominal thickness of XLPE insulation	Metallic Screening	Nominal thickness of PVC sheath	Approximate overall diameter of cable	Approximate weight of cable	
			Approximate thickness of copper tape			Copper	Aluminium
mm <sup>2</sup>	mm	mm	mm	mm	mm	Kg / Km	Kg / Km
50	8.1	5.5	0.1	1.8	26	1027	729
70	9.7	5.5	0.1	1.8	27	1275	843
95	11.5	5.5	0.1	1.9	29	1588	990
120	12.9	5.5	0.1	2.0	31	1878	1122
150	14.3	5.5	0.1	2.0	32	2176	1247
185	16.1	5.5	0.1	2.1	34	2593	1428
240	18.4	5.5	0.1	2.1	36	3222	1677
300	20.6	5.5	0.1	2.2	39	3886	1947
400	23.3	5.5	0.1	2.3	42	4782	2302
500	26.2	5.5	0.1	2.4	45	5840	2713
630	29.8	5.5	0.1	2.5	49	7348	3291
800	33.7	5.5	0.1	2.6	53	9145	3957



**XLPE INSULATED UNARMoured PVC SHEATHED CABLE - SINGLE CORE  
 CU/XLPE/SCW/PVC CABLE ( WITH COPPER WIRE SCREENED )  
 AL/XLPE/SCW/PVC CABLE ( WITH COPPER WIRE SCREENED )**

19 / 33 (36) kV

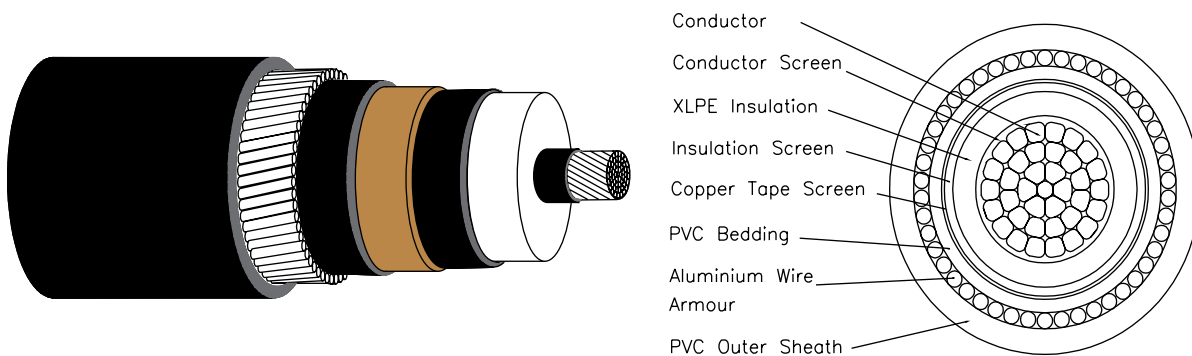
Nominal cross-sectional area of conductor	Nominal diameter of conductor	Nominal thickness of XLPE insulation	Nominal cross-sectional area of metallic screen	Nominal thickness of PVC sheath	Approximate overall diameter of cable	Approximate weight of cable	
						Copper	Aluminium
mm <sup>2</sup>	mm	mm	mm <sup>2</sup>	mm	mm	Kg / Km	Kg / Km
50	8.1	8.0	16	2.0	33	1405	1107
70	9.7	8.0	16	2.0	35	1662	1231
95	11.5	8.0	16	2.1	37	1989	1391
120	12.9	8.0	16	2.1	38	2273	1517
150	14.3	8.0	25	2.2	40	2680	1752
185	16.1	8.0	25	2.2	42	3091	1926
240	18.4	8.0	25	2.3	44	3754	2208
300	20.6	8.0	25	2.4	47	4434	2495
400	23.3	8.0	35	2.5	49	5442	2962
500	26.2	8.0	35	2.6	52	6520	3393
630	29.8	8.0	35	2.7	57	8055	3999
800	33.7	8.0	50	2.8	61	10018	4830

**XLPE INSULATED UNARMoured PVC SHEATHED CABLE - SINGLE CORE  
 CU/XLPE/SCT/PVC CABLE ( WITH COPPER TAPE SCREENED )  
 AL/XLPE/SCT/PVC CABLE ( WITH COPPER TAPE SCREENED )**

19 / 33 (36) kV

Nominal cross-sectional area of conductor	Nominal diameter of conductor	Nominal thickness of XLPE insulation	Metallic Screening	Nominal thickness of PVC sheath	Approximate overall diameter of cable	Approximate weight of cable	
			Approximate thickness of copper tape			Copper	Aluminium
mm <sup>2</sup>	mm	mm	mm	mm	mm	Kg / Km	Kg / Km
50	8.1	8.0	0.1	2.0	31	1297	999
70	9.7	8.0	0.1	2.0	33	1558	1127
95	11.5	8.0	0.1	2.1	35	1888	1290
120	12.9	8.0	0.1	2.1	36	2176	1420
150	14.3	8.0	0.1	2.2	38	2502	1574
185	16.1	8.0	0.1	2.2	39	2917	1752
240	18.4	8.0	0.1	2.3	42	3585	2039
300	20.6	8.0	0.1	2.4	44	4269	2330
400	23.3	8.0	0.1	2.5	47	5190	2710
500	26.2	8.0	0.1	2.6	50	6274	3148
630	29.8	8.0	0.1	2.7	55	7819	3763
800	33.7	8.0	0.1	2.8	59	9651	4463

# SINGLE CORE - XLPE INSULATED ARMoured PVC SHEATHED CABLE FOR VOLTAGES 6.6 kV UP TO AND INCLUDING 33kV TO IEC 60502



## DESCRIPTION

Circular compacted stranded copper or aluminium conductor, XLPE insulated, with copper tape screened and covered with extruded PVC bedding, aluminium wire armoured and PVC outer sheath.

## CONSTRUCTION

- 1 Conductor**  
Plain circular compacted stranded copper or aluminium conductor to IEC 60228 class 2.
- 2 Conductor Screen**  
Extruded layer of semiconductive compound.
- 3 Insulation**  
XLPE (cross-linked polyethylene) rated at 90 °C.
- 4 Insulation Screen**
  - a. Non-metallic part**  
Extruded layer of semiconductive compound.
  - b. Metallic part**  
Copper tape screen (SCT).
- 5 Bedding**  
Extruded layer of PVC ST2 compound.
- 6 Armour**  
Aluminium wires shall be applied helically over the PVC bedding.
- 7 Outer Sheath**  
PVC type ST2 to IEC 60502 colour black.

## APPLICATION

For installation on trays, ducts or direct burial.

Note : cables complying with BS 6622 and customer's specification are available upon request.  
: PE outer sheath is available upon request.

**XLPE INSULATED ARMoured PVC SHEATHED CABLE - SINGLE CORE  
CU/XLPE/SCT/PVC/AWA/PVC CABLE ( WITH COPPER TAPE SCREENED )  
AL/XLPE/SCT/PVC/AWA/PVC CABLE ( WITH COPPER TAPE SCREENED )**

**3.8 / 6.6 (7.2) kV**

Nominal cross-sectional area of conductor	Nominal diameter of conductor	Nominal thickness of XLPE insulation	Metallic Screening	Nominal diameter of aluminium wire	Nominal thickness of PVC sheath	Approximate overall diameter of cable	Approximate weight of cable	
			Approximate thickness of copper tape				Copper	Aluminium
mm <sup>2</sup>	mm	mm	mm	mm	mm	mm	Kg / Km	Kg / Km
50	8.1	3.0	0.1	1.6	1.8	27	1218	920
70	9.7	3.0	0.1	1.6	1.9	28	1495	1064
95	11.5	3.0	0.1	1.6	1.9	30	1811	1213
120	12.9	3.0	0.1	1.6	2.0	32	2115	1359
150	14.3	3.0	0.1	2.0	2.1	34	2528	1599
185	16.1	3.0	0.1	2.0	2.1	36	2946	1782
240	18.4	3.0	0.1	2.0	2.2	38	3630	2084
300	20.6	3.0	0.1	2.0	2.2	41	4301	2363
400	23.3	3.0	0.1	2.0	2.4	44	5255	2775
500	26.2	3.2	0.1	2.5	2.5	48	6560	3434
630	29.8	3.2	0.1	2.5	2.6	53	8168	4074
800	33.7	3.2	0.1	2.5	2.7	57	10030	4822

**XLPE INSULATED ARMoured PVC SHEATHED CABLE - SINGLE CORE  
CU/XLPE/SCT/PVC/AWA/PVC CABLE ( WITH COPPER TAPE SCREENED )  
AL/XLPE/SCT/PVC/AWA/PVC CABLE ( WITH COPPER TAPE SCREENED )**

**6.35 / 11 (12) kV**

Nominal cross-sectional area of conductor	Nominal diameter of conductor	Nominal thickness of XLPE insulation	Metallic Screening	Nominal diameter of aluminium wire	Nominal thickness of PVC sheath	Approximate overall diameter of cable	Approximate weight of cable	
			Approximate thickness of copper tape				Copper	Aluminium
mm <sup>2</sup>	mm	mm	mm	mm	mm	mm	Kg / Km	Kg / Km
50	8.1	3.4	0.1	1.6	1.8	27	1261	963
70	9.7	3.4	0.1	1.6	1.9	29	1541	1109
95	11.5	3.4	0.1	1.6	2.0	31	1874	1276
120	12.9	3.4	0.1	2.0	2.0	33	2247	1491
150	14.3	3.4	0.1	2.0	2.1	35	2581	1652
185	16.1	3.4	0.1	2.0	2.1	37	3001	1837
240	18.4	3.4	0.1	2.0	2.2	39	3688	2142
300	20.6	3.4	0.1	2.0	2.3	42	4382	2443
400	23.3	3.4	0.1	2.5	2.4	46	5524	3003
500	26.2	3.4	0.1	2.5	2.5	48	6590	3464
630	29.8	3.4	0.1	2.5	2.6	53	8201	4145
800	33.7	3.4	0.1	2.5	2.8	58	10132	4944

**XLPE INSULATED ARMoured PVC SHEATHED CABLE - SINGLE CORE  
 CU/XLPE/SCT/PVC/AWA/PVC CABLE ( WITH COPPER TAPE SCREENED )  
 AL/XLPE/SCT/PVC/AWA/PVC CABLE ( WITH COPPER TAPE SCREENED )**

**8.75 / 15 (17.5) kV**

Nominal cross-sectional area of conductor	Nominal diameter of conductor	Nominal thickness of XLPE insulation	Metallic Screening	Nominal diameter of aluminium wire	Nominal thickness of PVC sheath	Approximate overall diameter of cable	Approximate weight of cable	
			Approximate thickness of copper tape				Copper	Aluminium
mm <sup>2</sup>	mm	mm	mm	mm	mm	mm	Kg / Km	Kg / Km
50	8.1	4.5	0.1	1.6	1.9	30	1401	1103
70	9.7	4.5	0.1	1.6	2.0	32	1688	1257
95	11.5	4.5	0.1	2.0	2.1	34	2111	1513
120	12.9	4.5	0.1	2.0	2.1	36	2412	1656
150	14.3	4.5	0.1	2.0	2.2	37	2752	1824
185	16.1	4.5	0.1	2.0	2.2	39	3188	2024
240	18.4	4.5	0.1	2.0	2.3	42	3875	2330
300	20.6	4.5	0.1	2.0	2.4	44	4579	2640
400	23.3	4.5	0.1	2.5	2.5	48	5709	3229
500	26.2	4.5	0.1	2.5	2.6	51	6849	3723
630	29.8	4.5	0.1	2.5	2.7	56	8456	4400
800	33.7	4.5	0.1	2.5	2.8	60	10362	5174

**XLPE INSULATED ARMoured PVC SHEATHED CABLE - SINGLE CORE  
 CU/XLPE/SCT/PVC/AWA/PVC CABLE ( WITH COPPER TAPE SCREENED )  
 AL/XLPE/SCT/PVC/AWA/PVC CABLE ( WITH COPPER TAPE SCREENED )**

**12.7 / 22 (24) kV**

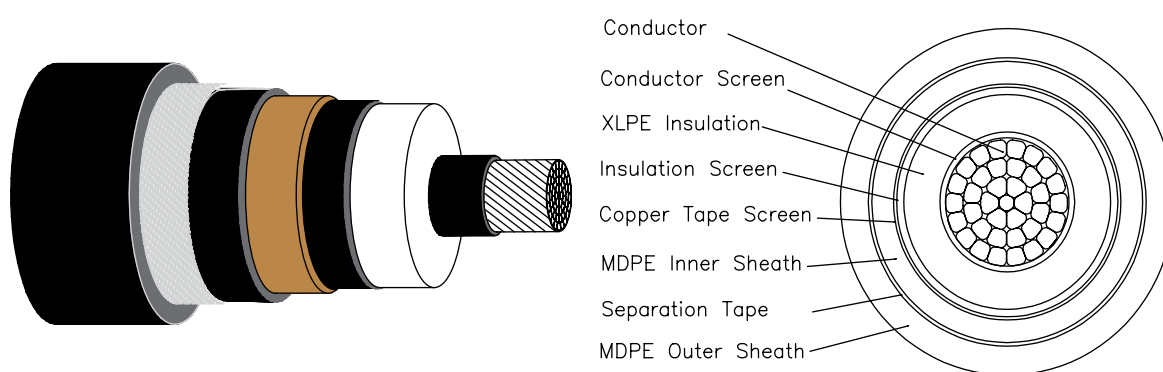
Nominal cross-sectional area of conductor	Nominal diameter of conductor	Nominal thickness of XLPE insulation	Metallic Screening	Nominal diameter of aluminium wire	Nominal thickness of PVC sheath	Approximate overall diameter of cable	Approximate weight of cable	
			Approximate thickness of copper tape				Copper	Aluminium
mm <sup>2</sup>	mm	mm	mm	mm	mm	mm	Kg / Km	Kg / Km
50	8.1	5.5	0.1	2.0	2.0	33	1615	1317
70	9.7	5.5	0.1	2.0	2.1	35	1910	1478
95	11.5	5.5	0.1	2.0	2.1	36	2251	1653
120	12.9	5.5	0.1	2.0	2.2	38	2573	1818
150	14.3	5.5	0.1	2.0	2.2	39	2900	1972
185	16.1	5.5	0.1	2.0	2.3	41	3352	2187
240	18.4	5.5	0.1	2.0	2.4	44	4057	2512
300	20.6	5.5	0.1	2.5	2.5	47	4945	3006
400	23.3	5.5	0.1	2.5	2.6	50	5912	3432
500	26.2	5.5	0.1	2.5	2.7	54	7064	3938
630	29.8	5.5	0.1	2.5	2.8	58	8711	4655
800	33.7	5.5	0.1	2.5	2.9	62	10623	5435

**XLPE INSULATED ARMoured PVC SHEATHED CABLE - SINGLE CORE  
 CU/XLPE/SCT/PVC/AWA/PVC CABLE ( WITH COPPER TAPE SCREENED )  
 AL/XLPE/SCT/PVC/AWA/PVC CABLE ( WITH COPPER TAPE SCREENED )**

**19/33 (36) kV**

Nominal cross-sectional area of conductor	Nominal diameter of conductor	Nominal thickness of XLPE insulation	Metallic Screening	Nominal diameter of aluminium wire	Nominal thickness of PVC sheath	Approximate overall diameter of cable	Approximate weight of cable	
			Approximate thickness of copper tape				Copper	Aluminium
mm <sup>2</sup>	mm	mm	mm	mm	mm	mm	Kg / Km	Kg / Km
50	8.1	8.0	0.1	2.0	2.2	38	1993	1695
70	9.7	8.0	0.1	2.0	2.2	40	2293	1863
95	11.5	8.0	0.1	2.0	2.3	42	2659	2061
120	12.9	8.0	0.1	2.0	2.4	43	2996	2240
150	14.3	8.0	0.1	2.5	2.4	46	3498	2570
185	16.1	8.0	0.1	2.5	2.5	48	3979	2814
240	18.4	8.0	0.1	2.5	2.6	50	4714	3169
300	20.6	8.0	0.1	2.5	2.6	53	5462	3523
400	23.3	8.0	0.1	2.5	2.8	56	6480	4000
500	26.2	8.0	0.1	2.5	2.9	59	7662	4536
630	29.8	8.0	0.1	2.5	3.0	64	9362	5306
800	33.7	8.0	0.1	2.5	3.1	68	11300	6112

# SINGLE CORE - XLPE INSULATED UNARMoured PE INNER AND OUTER SHEATH CABLE FOR VOLTAGES 6.35 / 11 (12) kV AND 12.7 / 22 (24) kV



## DESCRIPTION

Circular compacted stranded aluminium conductor, XLPE insulated, with copper tape screened, extruded with PE inner sheath and followed by an extruded PE outer sheath. Complies with Tenaga Nasional Berhad (TNB) specification.

## CONSTRUCTION

### 1 Conductor

Plain circular compacted stranded aluminium conductor to IEC 60228 class 2.

### 2 Conductor Screen

Extruded layer of semiconductive compound.

### 3 Insulation

XLPE (cross-linked polyethylene) rated at 90 °C.

### 4 Insulation Screen

#### a Non-metallic part

Extruded layer of semiconductive compound.

#### b Metallic part

Copper tape screen (SCT).

### 5 Inner Sheath

MDPE type ST<sub>7</sub> to IEC 60502 colour black.

### 6 Outer Sheath

MDPE type ST<sub>7</sub> to IEC 60502 colour black containing an effective termite repellent.

## APPLICATION

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

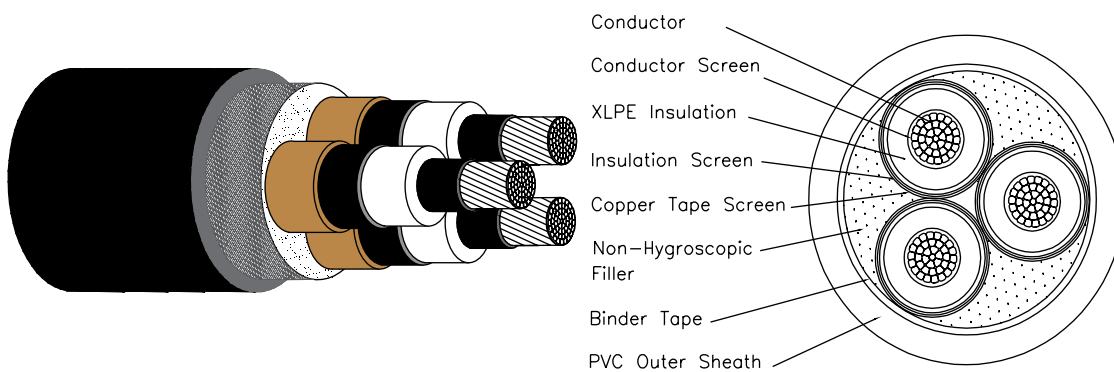
**XLPE INSULATED UNARMoured PE INNER AND OUTER SHEATH CABLE - SINGLE CORE  
AL/XLPE/SCT/MDPE/MDPE CABLE ( WITH COPPER TAPE SCREENED ) 6.35 / 11 (12) kV**

Nominal cross-sectional area of conductor	Nominal diameter of conductor	Nominal thickness of XLPE insulation	Metallic Screening	Nominal thickness of PE inner sheath	Nominal thickness of PE outer sheath	Approximate overall diameter of cable	Approximate weight of cable
			Approximate thickness of copper tape				Aluminium
mm <sup>2</sup>	mm	mm	mm	mm	mm	Kg / Km	Kg / Km
50	8.1	3.4	0.2	2.5	1.8	27	772
70	9.7	3.4	0.2	2.5	1.8	29	891
95	11.5	3.4	0.2	2.5	1.8	30	1029
120	12.9	3.4	0.2	2.5	1.8	32	1151
150	14.3	3.4	0.2	2.5	1.9	33	1289
185	16.1	3.4	0.2	2.5	1.9	35	1458
240	18.4	3.4	0.2	2.5	2.0	38	1722
300	20.6	3.4	0.2	2.5	2.1	40	1991
400	23.3	3.4	0.2	2.5	2.2	43	2346
500	26.2	3.4	0.2	2.5	2.3	46	2755
630	29.8	3.4	0.2	2.5	2.4	51	3332
800	33.7	3.4	0.2	2.5	2.5	55	3995

**XLPE INSULATED UNARMoured PE INNER AND OUTER SHEATH CABLE - SINGLE CORE  
AL/XLPE/SCT/MDPE/MDPE CABLE ( WITH COPPER TAPE SCREENED ) 12.7 / 22 (24) kV**

Nominal cross-sectional area of conductor	Nominal diameter of conductor	Nominal thickness of XLPE insulation	Metallic Screening	Nominal thickness of PE inner sheath	Nominal thickness of PE outer sheath	Approximate overall diameter of cable	Approximate weight of cable
			Approximate thickness of copper tape				Aluminium
mm <sup>2</sup>	mm	mm	mm	mm	mm	Kg / Km	Kg / Km
50	8.1	5.5	0.2	2.5	1.8	31	983
70	9.7	5.5	0.2	2.5	1.9	33	1123
95	11.5	5.5	0.2	2.5	1.9	35	1272
120	12.9	5.5	0.2	2.5	2.0	36	1414
150	14.3	5.5	0.2	2.5	2.0	38	1551
185	16.1	5.5	0.2	2.5	2.1	40	1743
240	18.4	5.5	0.2	2.5	2.2	42	2025
300	20.6	5.5	0.2	2.5	2.2	45	2297
400	23.3	5.5	0.2	2.5	2.3	47	2670
500	26.2	5.5	0.2	2.5	2.4	51	3099
630	29.8	5.5	0.2	2.5	2.5	55	3704
800	33.7	5.5	0.2	2.5	2.7	59	4411

# THREE CORES - XLPE INSULATED UNARMoured PVC SHEATHED CABLE FOR VOLTAGES 6.6 kV UP TO AND INCLUDING 33 kV TO IEC 60502



## DESCRIPTION

Circular compacted stranded copper or aluminium conductor, XLPE insulated, copper tape screened, three cores assembled together with non-hygroscopic polypropylene fillers and extruded with PVC outer sheath.

## CONSTRUCTION

### 1 Conductor

Plain circular compacted stranded copper or aluminium conductor to IEC 60228 class 2.

### 2 Conductor Screen

Extruded layer of semiconductive compound.

### 3 Insulation

XLPE (cross-linked polyethylene) rated at 90 °C.

### 4 Insulation Screen

#### a Non-metallic part

Extruded layer of semiconductive compound.

#### b Metallic part

Copper tape screen (SCT).

### 5 Colours For Core Identification

Red, yellow and blue tapes shall be applied between non metallic and metallic part of insulation screen.

### 6 Assembly

Three screened cores are laid up together, if necessary filled with non-hygroscopic material compatible with insulation and covered with a layer of PVC sheath.

### 7 Outer Sheath

PVC type ST2 IEC 60502 colour black.

## APPLICATION

These cables are generally suitable for direct burial or for installation on trays or ducts. Where there is a risk of mechanical damage, armoured cables should be used.

Note: Cables complying with BS 6622 and customer's specification are available upon request.

: PE outer sheath is available upon request.



**XLPE INSULATED UNARMoured PVC SHEATHED CABLE - THREE CORES**  
**CU/XLPE/SCT/PVC CABLE ( WITH COPPER TAPE SCREENED )**  
**AL/XLPE/SCT/PVC CABLE ( WITH COPPER TAPE SCREENED )**

3.8 / 6.6 (7.2) kV

Nominal cross-sectional area of conductor	Nominal diameter of conductor	Nominal thickness of XLPE insulation	Metallic Screening	Nominal thickness of PVC sheath	Approximate overall diameter of cable	Approximate weight of cable	
			Approximate thickness of copper tape			Copper	Aluminium
mm <sup>2</sup>	mm	mm	mm	mm	mm	Kg / Km	Kg / Km
50	8.1	3.0	0.1	2.3	41	2640	1728
70	9.7	3.0	0.1	2.4	44	3417	2097
95	11.5	3.0	0.1	2.6	49	4385	2555
120	12.9	3.0	0.1	2.7	52	5263	2950
150	14.3	3.0	0.1	2.8	55	6211	3371
185	16.1	3.0	0.1	2.9	59	7485	3922
240	18.4	3.0	0.1	3.1	65	9506	4777
300	20.6	3.0	0.1	3.2	70	11556	5623
400	23.3	3.0	0.1	3.4	76	14372	6783

**XLPE INSULATED UNARMoured PVC SHEATHED CABLE - THREE CORES**  
**CU/XLPE/SCT/PVC CABLE ( WITH COPPER TAPE SCREENED )**  
**AL/XLPE/SCT/PVC CABLE ( WITH COPPER TAPE SCREENED )**

6.35 / 11 (12) kV

Nominal cross-sectional area of conductor	Nominal diameter of conductor	Nominal thickness of XLPE insulation	Metallic Screening	Nominal thickness of PVC sheath	Approximate overall diameter of cable	Approximate weight of cable	
			Approximate thickness of copper tape			Copper	Aluminium
mm <sup>2</sup>	mm	mm	mm	mm	mm	Kg / Km	Kg / Km
50	8.1	3.4	0.1	2.4	43	2769	1856
70	9.7	3.4	0.1	2.5	46	3557	2237
95	11.5	3.4	0.1	2.6	50	4513	2683
120	12.9	3.4	0.1	2.7	54	5398	3085
150	14.3	3.4	0.1	2.8	57	6354	3513
185	16.1	3.4	0.1	3.0	61	7666	4102
240	18.4	3.4	0.1	3.1	66	9670	4941
300	20.6	3.4	0.1	3.3	71	11765	5833
400	23.3	3.4	0.1	3.5	78	14598	7010

**XLPE INSULATED UNARMoured PVC SHEATHED CABLE - THREE CORES  
CU/XLPE/SCT/PVC CABLE ( WITH COPPER TAPE SCREENED )  
AL/XLPE/SCT/PVC CABLE ( WITH COPPER TAPE SCREENED )**

**8.7 / 15 (17.5) kV**

Nominal cross-sectional area of conductor	Nominal diameter of conductor	Nominal thickness of XLPE insulation	Metallic Screening		Approximate overall diameter of cable	Approximate weight of cable	
			Approximate thickness of copper tape	Nominal thickness of PVC sheath		Copper	Aluminium
mm <sup>2</sup>	mm	mm	mm	mm	mm	Kg / Km	Kg / Km
50	8.1	4.5	0.1	2.6	48	3137	2224
70	9.7	4.5	0.1	2.7	52	3953	2633
95	11.5	4.5	0.1	2.8	55	4937	3107
120	12.9	4.5	0.1	2.9	59	5845	3533
150	14.3	4.5	0.1	3.0	62	6826	3985
185	16.1	4.5	0.1	3.1	66	8137	4574
240	18.4	4.5	0.1	3.3	71	10212	5482
300	20.6	4.5	0.1	3.4	76	12308	6376
400	23.3	4.5	0.1	3.7	83	15223	7635

**XLPE INSULATED UNARMoured PVC SHEATHED CABLE - THREE CORES  
CU/XLPE/SCT/PVC CABLE ( WITH COPPER TAPE SCREENED )  
AL/XLPE/SCT/PVC CABLE ( WITH COPPER TAPE SCREENED )**

**12.7 / 22 (24) kV**

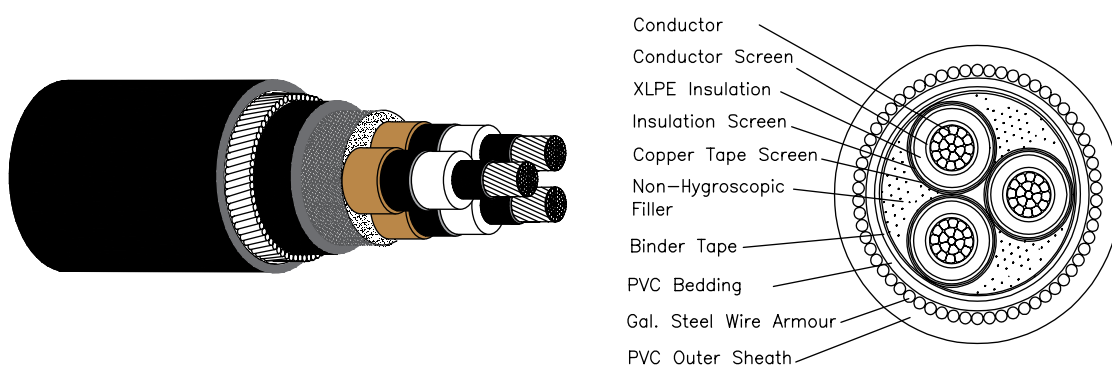
Nominal cross-sectional area of conductor	Nominal diameter of conductor	Nominal thickness of XLPE insulation	Metallic Screening		Approximate overall diameter of cable	Approximate weight of cable	
			Approximate thickness of copper tape	Nominal thickness of PVC sheath		Copper	Aluminium
mm <sup>2</sup>	mm	mm	mm	mm	mm	Kg / Km	Kg / Km
50	8.1	5.5	0.1	2.7	52	3483	2570
70	9.7	5.5	0.1	2.8	56	4323	3003
95	11.5	5.5	0.1	3.0	60	5360	3530
120	12.9	5.5	0.1	3.1	64	6292	3980
150	14.3	5.5	0.1	3.2	67	7293	4453
185	16.1	5.5	0.1	3.3	71	8631	5067
240	18.4	5.5	0.1	3.4	76	10706	5976
300	20.6	5.5	0.1	3.6	81	12872	6939
400	23.3	5.5	0.1	3.8	87	15789	8201

**XLPE INSULATED UNARMoured PVC SHEATHED CABLE - THREE CORES  
CU/XLPE/SCT/PVC CABLE ( WITH COPPER TAPE SCREENED )  
AL/XLPE/SCT/PVC CABLE ( WITH COPPER TAPE SCREENED )**

**19 / 33 (36) kV**

Nominal cross-sectional area of conductor	Nominal diameter of conductor	Nominal thickness of XLPE insulation	Metallic Screening		Approximate overall diameter of cable	Approximate weight of cable	
			Approximate thickness of copper tape	Nominal thickness of PVC sheath		Copper	Aluminium
mm <sup>2</sup>	mm	mm	mm	mm	mm	Kg / Km	Kg / Km
50	8.1	8.0	0.1	3.1	64	4521	3608
70	9.7	8.0	0.1	3.2	68	5420	4100
95	11.5	8.0	0.1	3.3	72	6494	4664
120	12.9	8.0	0.1	3.4	75	7478	5165
150	14.3	8.0	0.1	3.5	78	8530	5689
185	16.1	8.0	0.1	3.7	82	9970	6406
240	18.4	8.0	0.1	3.8	88	12131	7401
300	20.6	8.0	0.1	4.0	93	14380	8448
400	23.3	8.0	0.1	4.2	99	17402	9814

# THREE CORES - XLPE INSULATED ARMoured PVC SHEATHED CABLE FOR VOLTAGES 6.6 kV UP TO AND INCLUDING 33 kV TO IEC 60502



## DESCRIPTION

Circular compacted stranded copper or aluminium conductor, XLPE insulated copper tape screened, three cores assembled together with non-hygroscopic polypropylene fillers, covered with extruded PVC bedding, armoured and PVC outer sheath.

## CONSTRUCTION

### 1 Conductor

Plain circular compacted stranded copper or aluminium conductor to IEC 60228 class 2.

### 2 Conductor Screen

Extruded layer of semiconductive compound.

### 3 Insulation

XLPE (cross-linked polyethylene) rated at 90 °C.

### 4 Insulation Screen

#### a Non-metallic part

Extruded layer of semiconductive compound.

#### b Metallic part

Copper tape screen (SCT).

### 5 Colours For Core Identification

Red, yellow, and blue tapes shall be applied between non metallic and metallic part of insulation screen.

### 6 Assembly

Three screened cores are laid up together, if necessary filled with non-hygroscopic material compatible with insulation and covered with a layer of PVC sheath.

### 7 Bedding

Extruded layer of PVC ST2 compound.

### 8 Armour

Galvanized steel wires shall be applied helically over the PVC bedding.

### 9 Outer Sheath

PVC type ST2 to IEC 60502 colour black.

## APPLICATION

These cables are generally suitable for direct burial or for installation on trays or ducts. Where there is a risk of mechanical damage, armoured cable should be used.

Note: Cables complying with BS 6622 and customer's specification are available upon request. Galvanized steel tape is applied helically over the PVC bedding is available upon request.

**XLPE INSULATED ARMoured PVC SHEATHED CABLE - THREE CORES  
 CU/XLPE/SCT/PVC/SWA/PVC CABLE ( WITH COPPER TAPE SCREENED )  
 AL/XLPE/SCT/PVC/SWA/PVC CABLE ( WITH COPPER TAPE SCREENED )** **3.8 / 6.6 (7.2) kV**

Nominal cross-sectional area of conductor	Nominal diameter of conductor	Nominal thickness of XLPE insulation	Metallic Screening	Nominal diameter of steel wire	Nominal thickness of PVC sheath	Approximate overall diameter of cable	Approximate weight of cable	
			Approximate thickness of copper tape				Copper	Aluminium
mm <sup>2</sup>	mm	mm	mm	mm	mm	mm	Kg / Km	Kg / Km
50	8.1	3.0	0.1	2.5	2.6	50	5086	4173
70	9.7	3.0	0.1	2.5	2.7	54	6068	4749
95	11.5	3.0	0.1	2.5	2.9	58	7272	5442
120	12.9	3.0	0.1	2.5	3.0	61	8381	6068
150	14.3	3.0	0.1	2.5	3.1	65	9533	6692
185	16.1	3.0	0.1	2.5	3.2	69	11047	7484
240	18.4	3.0	0.1	3.15	3.4	76	14244	9514
300	20.6	3.0	0.1	3.15	3.6	81	16760	10827
400	23.3	3.0	0.1	3.15	3.8	88	20029	12441

**XLPE INSULATED ARMoured PVC SHEATHED CABLE - THREE CORES  
 CU/XLPE/SCT/PVC/SWA/PVC CABLE ( WITH COPPER TAPE SCREENED )  
 AL/XLPE/SCT/PVC/SWA/PVC CABLE ( WITH COPPER TAPE SCREENED )** **6.35 / 11 (12) kV**

Nominal cross-sectional area of conductor	Nominal diameter of conductor	Nominal thickness of XLPE insulation	Metallic Screening	Nominal diameter of steel wire	Nominal thickness of PVC sheath	Approximate overall diameter of cable	Approximate weight of cable	
			Approximate thickness of copper tape				Copper	Aluminium
mm <sup>2</sup>	mm	mm	mm	mm	mm	mm	Kg / Km	Kg / Km
50	8.1	3.4	0.1	2.5	2.7	51	5319	4406
70	9.7	3.4	0.1	2.5	2.8	55	6336	5016
95	11.5	3.4	0.1	2.5	2.9	59	7500	5670
120	12.9	3.4	0.1	2.5	3.0	63	8617	6304
150	14.3	3.4	0.1	2.5	3.1	66	9805	6965
185	16.1	3.4	0.1	2.5	3.3	70	11334	7771
240	18.4	3.4	0.1	3.15	3.5	77	14597	9867
300	20.6	3.4	0.1	3.15	3.6	82	17089	11157
400	23.3	3.4	0.1	3.15	3.9	89	20417	12828

**XLPE INSULATED ARMoured PVC SHEATHED CABLE - THREE CORES  
 CU/XLPE/SCT/PVC/SWA/PVC CABLE ( WITH COPPER TAPE SCREENED )  
 AL/XLPE/SCT/PVC/SWA/PVC CABLE ( WITH COPPER TAPE SCREENED )** **8.7 / 15 (17.5) kV**

Nominal cross-sectional area of conductor	Nominal diameter of conductor	Nominal thickness of XLPE insulation	Metallic Screening	Nominal diameter of steel wire	Nominal thickness of PVC sheath	Approximate overall diameter of cable	Approximate weight of cable	
			Approximate thickness of copper tape				Copper	Aluminium
mm <sup>2</sup>	mm	mm	mm	mm	mm	mm	Kg / Km	Kg / Km
50	8.1	4.5	0.1	2.5	2.9	57	5976	5063
70	9.7	4.5	0.1	2.5	3.0	61	7069	5749
95	11.5	4.5	0.1	2.5	3.1	65	8264	6434
120	12.9	4.5	0.1	2.5	3.2	68	9407	7094
150	14.3	4.5	0.1	3.15	3.4	73	11405	8564
185	16.1	4.5	0.1	3.15	3.5	77	13064	9500
240	18.4	4.5	0.1	3.15	3.6	83	15540	10810
300	20.6	4.5	0.1	3.15	3.8	88	18046	12113
400	23.3	4.5	0.1	3.15	4.0	95	21448	13860

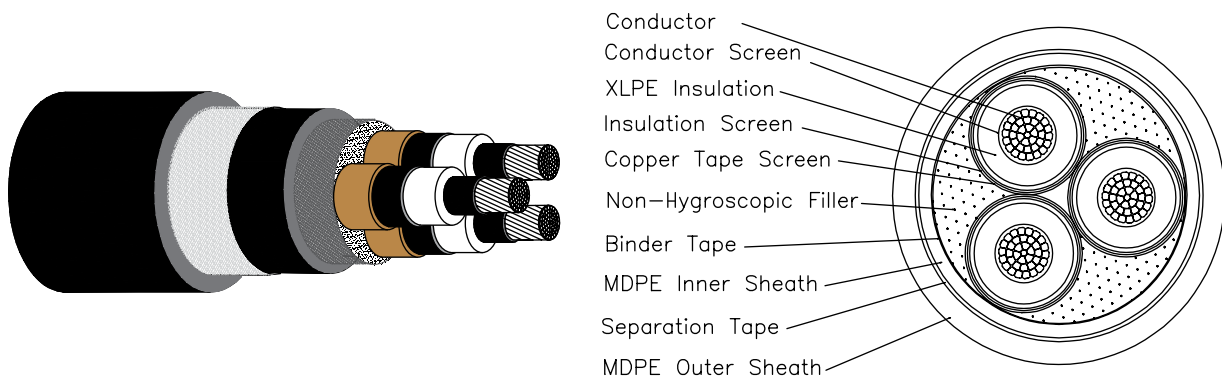
**XLPE INSULATED ARMoured PVC SHEATHED CABLE - THREE CORES  
 CU/XLPE/SCT/PVC/SWA/PVC CABLE ( WITH COPPER TAPE SCREENED )  
 AL/XLPE/SCT/PVC/SWA/PVC CABLE ( WITH COPPER TAPE SCREENED )** **12.7/ 22 (24) kV**

Nominal cross-sectional area of conductor	Nominal diameter of conductor	Nominal thickness of XLPE insulation	Metallic Screening	Nominal diameter of steel wire	Nominal thickness of PVC sheath	Approximate overall diameter of cable	Approximate weight of cable	
			Approximate thickness of copper tape				Copper	Aluminium
mm <sup>2</sup>	mm	mm	mm	mm	mm	mm	Kg / Km	Kg / Km
50	8.1	5.5	0.1	2.5	3.0	61	6606	5693
70	9.7	5.5	0.1	2.5	3.1	65	7697	6378
95	11.5	5.5	0.1	2.5	3.2	69	8947	7117
120	12.9	5.5	0.1	3.15	3.4	74	11021	8708
150	14.3	5.5	0.1	3.15	3.5	77	12195	9354
185	16.1	5.5	0.1	3.15	3.6	82	13882	10318
240	18.4	5.5	0.1	3.15	3.8	87	16436	11707
300	20.6	5.5	0.1	3.15	4.0	93	18982	13050
400	23.3	5.5	0.1	3.15	4.2	99	22485	14896

**XLPE INSULATED ARMoured PVC SHEATHED CABLE - THREE CORES  
 CU/XLPE/SCT/PVC/SWA/PVC CABLE ( WITH COPPER TAPE SCREENED )  
 AL/XLPE/SCT/PVC/SWA/PVC CABLE ( WITH COPPER TAPE SCREENED )** **19/33 (36) kV**

Nominal cross-sectional area of conductor	Nominal diameter of conductor	Nominal thickness of XLPE insulation	Metallic Screening	Nominal diameter of steel wire	Nominal thickness of PVC sheath	Approximate overall diameter of cable	Approximate weight of cable	
			Approximate thickness of copper tape				Copper	Aluminium
mm <sup>2</sup>	mm	mm	mm	mm	mm	mm	Kg / Km	Kg / Km
50	8.1	8.0	0.1	3.15	3.4	75	9250	8337
70	9.7	8.0	0.1	3.15	3.6	79	10466	9146
95	11.5	8.0	0.1	3.15	3.7	83	11858	10028
120	12.9	8.0	0.1	3.15	3.8	86	13124	10811
150	14.3	8.0	0.1	3.15	3.9	90	14460	11619
185	16.1	8.0	0.1	3.15	4.0	94	16116	12552
240	18.4	8.0	0.1	3.15	4.2	100	18825	14095
300	20.6	8.0	0.1	3.15	4.4	105	21466	15533
400	23.3	8.0	0.1	3.15	4.6	111	24969	17381

# THREE CORES - XLPE INSULATED UNARMoured PE INNER AND OUTER SHEATH CABLE FOR VOLTAGE 6.35 / 11 (12 ) kV



## DESCRIPTION

Circular compacted stranded aluminium conductor, XLPE insulated, with copper tape screened, three cores assembled together with non-hygroscopic polypropylene fillers, extruded with PE inner sheath and followed by an extruded PE outer sheath. Complies with Tenaga Nasional Berhad (TNB) specification..

## CONSTRUCTION

### 1 Conductor

Plain circular compacted stranded aluminium conductor to IEC 60228 class 2.

### 2 Conductor Screen

Extruded layer of semiconductive compound.

### 3 Insulation

XLPE (cross-linked polyethylene) rated at 90 °C.

### 4 Insulation Screen

#### a Non-metallic part

Extruded layer of semiconductive compound.

#### b Metallic part

Copper tape screen (SCT).

### 5 Colours For Core Identification

Red,yellow and blue tapes shall be applied between non metallic and metallic part of insulation screen.

### 6 Assembly

Three screened cores are laid up together, if necessary filled with non-hygroscopic material compatible with insulation and inner sheath.

### 7 Inner Sheath

MDPE type ST<sub>7</sub> to IEC 60502 colour black.

### 8 Outer Sheath

MDPE type ST<sub>7</sub> to IEC 60502 colour black, containing an effective termite repellent.

## APPLICATION

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

**XLPE INSULATED UNARMoured PE INNER AND OUTER SHEATH CABLE - THREE CORES  
AL/XLPE/SCT/MDPE/MDPE CABLE ( WITH COPPER TAPE SCREENED ) 6.35 / 11 (12) kV**

Nominal cross-sectional area of conductor	Nominal diameter of conductor	Nominal thickness of XLPE insulation	Metallic Screening	Nominal thickness of PE inner Sheath	Nominal thickness of PE outer Sheath	Approximate overall diameter of cable	Approximate weight of cable
			Approximate thickness of copper tape				Aluminium
mm <sup>2</sup>	mm	mm	mm	mm	mm	Kg / Km	Kg / Km
50	8.1	3.4	0.2	2.5	2.4	48	2264
70	9.7	3.4	0.2	2.5	2.5	52	2673
95	11.5	3.4	0.2	2.5	2.7	56	3163
120	12.9	3.4	0.2	2.5	2.8	60	3586
150	14.3	3.4	0.2	2.5	2.9	63	4035
185	16.1	3.4	0.2	2.5	3.0	67	4619
240	18.4	3.4	0.2	2.5	3.1	72	5512
300	20.6	3.4	0.2	2.5	3.3	77	6398
400	23.3	3.4	0.2	2.5	3.6	84	7624

# APPENDIX A : TECHNICAL DATA

## CURRENT CARRYING CAPACITY

The Current Carrying Capacity given in the following tables are based on the assumption shown below:

- 1) Maximum Conductor Temperature : ----- 90°C
- 2) Maximum Ambient Temperature : In Air (Voltage up to 1.9/3.3 (3.6) kV)----- 30°C  
(Voltage 6.6kV up to and including 33 kV) ----- 25°C  
In Ground ----- 15°C
- 3) Ground Thermal Resistivity : ..... 1.2°Cm / W
- 4) Laying Depth : For Voltage up to 1 kV-----0.5M  
For Higher Voltage above 1 kV -----0.8M

5) For other conditions, the rating factors included should be applied.

**Table 1 RATING FACTORS FOR CABLE IN FREE AIR**

FOR VOLTAGE UP TO 1.9 / 3.3 ( 3.6 ) kV							
Ambient Air Temperature	20 °C	25 °C	30 °C	35 °C	40 °C	45 °C	50 °C
Rating Factor	1.09	1.04	1.00	0.96	0.91	0.87	0.82

FOR VOLTAGE 6.6 kV UP TO AND INCLUDING 33kV							
Ambient Air Temperature	20 °C	25 °C	30 °C	35 °C	40 °C	45 °C	50 °C
Rating Factor	1.05	1.00	0.95	0.91	0.86	0.80	0.75

All the ratings for cables run in air are based upon the assumption that they are shielded from direct sunlight and without restriction of ventilation.

Effect of grouping cables : No reduction in rating is necessary where there is free circulation of air around the circuits provided that :

1. The horizontal clearance between circuits is not less than twice the overall diameter of an individual cable.
2. The vertical clearance between circuits is not less than four times the diameter of an individual cable.
3. If the number of circuits exceeds three, they are installed in a horizontal plane.

**Table 2 RATING FACTORS FOR CABLE IN GROUND**

Ambient Ground Temperature	10 °C	15 °C	20 °C	25 °C	30 °C	35 °C	40 °C	45 °C
Rating Factor	1.03	1.00	0.97	0.93	0.89	0.85	0.81	0.77



**Table 3 GROUP RATING FACTORS FOR CIRCUITS OF THREE SINGLE CORE CABLE, IN TREFOIL AND LAID FLAT TOUCHING, HORIZONTAL FORMATION**

Cable voltage (kV)	Number of circuits	Spacing of circuit (between centres of cable groups)					
		Touching		0.15 m*	0.3m	0.45m	0.6m
		Trefoil	Laid flat				
0.6 / 1	2	0.77	0.80	0.82	0.88	0.90	0.93
	3	0.65	0.68	0.72	0.79	0.83	0.87
	4	0.59	0.63	0.67	0.75	0.81	0.85
	5	0.55	0.58	0.63	0.72	0.78	0.83
	6	0.52	0.56	0.60	0.70	0.77	0.82
	7	0.50	0.54	0.58	0.68	0.76	0.81
	8	0.48	0.52	0.56	0.66	0.75	0.79
	9	0.46	0.50	0.54	0.64	0.74	0.78
	10	0.44	0.48	0.52	0.62	0.73	0.77
	1.9 / 3.3 to 12.7 / 22	2	0.78	0.80	0.81	0.85	0.88
3		0.66	0.69	0.71	0.76	0.80	0.83
4		0.60	0.63	0.65	0.72	0.76	0.80
5		0.55	0.58	0.61	0.68	0.73	0.77
6		0.52	0.55	0.58	0.66	0.72	0.76
7		0.49	0.52	0.55	0.63	0.69	0.74
8		0.46	0.49	0.51	0.60	0.66	0.72
9		0.43	0.46	0.48	0.56	0.63	0.70
10		0.40	0.43	0.45	0.53	0.61	0.68
19 / 33		2	0.79	0.81	0.81	0.85	0.88
	3	0.67	0.70	0.71	0.76	0.80	0.83
	4	0.62	0.65	0.65	0.72	0.76	0.80
	5	0.57	0.60	0.60	0.68	0.73	0.76
	6	0.54	0.57	0.57	0.66	0.72	0.76

\* Note: This spacing will not be possible for some of the larger diameter cable.

**Table 4 GROUP RATING FACTORS FOR MULTICORE CABLE IN HORIZONTAL FORMATION**

Cable voltage (kV)	Number of Cables in Group	Spacing of circuits (between centres of cable groups)				
		Touching	0.15m	0.3m	0.45m	0.6m
0.6 / 1	2	0.81	0.87	0.91	0.93	0.94
	3	0.70	0.78	0.84	0.87	0.90
	4	0.63	0.74	0.81	0.86	0.89
	5	0.59	0.70	0.78	0.83	0.87
	6	0.55	0.67	0.76	0.82	0.86
	7	0.52	0.64	0.74	0.79	0.83
	8	0.50	0.62	0.72	0.77	0.81
	9	0.48	0.60	0.70	0.75	0.79
	10	0.46	0.58	0.68	0.73	0.77
	1.9 / 3.3 to 12.7 / 22	2	0.80	0.85	0.89	0.90
3		0.69	0.75	0.80	0.84	0.86
4		0.63	0.70	0.77	0.80	0.84
5		0.57	0.66	0.73	0.78	0.81
6		0.55	0.63	0.71	0.76	0.80
7		0.53	0.60	0.68	0.74	0.78
8		0.50	0.57	0.66	0.72	0.76
9		0.48	0.55	0.64	0.70	0.74
10		0.46	0.53	0.62	0.68	0.73
19 / 33		2	0.80	0.83	0.87	0.89
	3	0.70	0.73	0.78	0.82	0.85
	4	0.64	0.68	0.74	0.78	0.82
	5	0.59	0.63	0.70	0.75	0.79
	6	0.56	0.60	0.68	0.74	0.78

**Table 5 RATING FACTORS FOR SOIL THERMAL RESISTIVITY**

Conductor Size (mm <sup>2</sup> )	Soil Thermal Resistivity (Km / W)						
	0.8	0.9	1.0	1.5	2.0	2.5	3.0
Single core cables							
Up to 150	1.16	1.11	1.07	0.91	0.81	0.73	0.67
From 185 to 400	1.17	1.12	1.07	0.90	0.80	0.72	0.66
From 500 to 1200	1.18	1.13	1.08	0.90	0.79	0.71	0.65
Multicore cables							
Up to 16	1.09	1.06	1.04	0.95	0.86	0.79	0.74
From 25 to 150	1.14	1.10	1.07	0.93	0.84	0.76	0.70
From 185 to 400	1.16	1.11	1.07	0.92	0.82	0.74	0.68

**Table 6 RATING FACTORS FOR DEPTH OF LAYING  
( to centre of cable or trefoil group of cable )**

Depth of Laying (m)	0.6 / 1 (1.2) kV Cables			1.9 / 3.3 (3.6) kV to 19/33 (36) kV Cable	
	up to 50 mm <sup>2</sup>	70mm <sup>2</sup> to 300mm <sup>2</sup>	above 300mm <sup>2</sup>	up to 300mm <sup>2</sup>	above 300mm <sup>2</sup>
0.5	1.00	1.00	1.00	1.00	1.00
0.6	0.99	0.98	0.97	1.00	1.00
0.8	0.97	0.96	0.94	1.00	1.00
1.00	0.95	0.94	0.92	0.98	0.97
1.25	0.94	0.92	0.90	0.96	0.95
1.50	0.93	0.91	0.89	0.95	0.94
1.75	0.92	0.89	0.87	0.94	0.92
2.00	0.91	0.88	0.86	0.92	0.90
2.50	0.90	0.87	0.85	0.91	0.89
3.0 or above	0.89	0.86	0.83	0.90	0.88

**Table 7a CURRENT RATINGS FOR  
0.6 / 1 (1.2) kV UNARMoured XLPE CABLE**

Conductor Size (mm <sup>2</sup> )	Current Rating						Voltage Drop		
	In Air			In Ground			1C	2C	3/4C
	1C	2C	3/4C	1C	2C	3/4C			
	(A)			(A)			(mV/ A/m)		
<b>Copper Conductor</b>									
1.5	25	26	23	35	39	33	27	31	27
2.5	33	36	32	46	52	43	16	19	16
4	44	49	42	59	67	56	10	12	10
6	56	63	54	73	85	71	6.8	7.9	6.8
10	77	86	75	98	113	95	4.0	4.7	4.0
16	102	115	100	125	146	122	2.5	2.9	2.5
25	135	149	127	161	190	158	1.62	1.9	1.65
35	169	185	158	193	229	191	1.18	1.35	1.15
50	207	225	192	228	265	223	0.87	1.00	0.87
70	268	289	246	279	326	274	0.62	0.69	0.60
95	328	352	298	335	391	329	0.47	0.52	0.45
120	383	410	346	380	445	375	0.39	0.42	0.37
150	444	473	399	426	499	421	0.33	0.35	0.30
185	510	542	456	482	566	478	0.28	0.29	0.26
240	607	641	538	558	658	556	0.24	0.24	0.21
300	703	741	621	629	745	630	0.21	0.21	0.185
400	823	865	741	712	849	719	0.195	0.19	0.165
500	946	-	-	802	-	-	0.180	-	-
630	1088	-	-	900	-	-	0.170	-	-
800	1214	-	-	1002	-	-	0.165	-	-
1000	1349	-	-	1090	-	-	0.155	-	-
<b>Aluminium Conductor</b>									
6	46	49	42	60	69	58	1.0	12	10
10	60	67	58	75	87	73	6.8	7.9	6.8
16	78	91	77	97	113	94	4.2	4.8	4.2
25	103	108	97	125	147	123	2.7	3.1	2.7
35	129	135	120	149	177	148	1.9	2.2	1.95
50	159	164	146	177	205	173	1.4	1.65	1.45
70	206	211	187	217	253	213	0.98	1.15	0.97
95	253	257	227	259	303	255	0.74	0.84	0.72
120	296	300	263	295	346	291	0.60	0.66	0.58
150	343	346	304	331	387	326	0.49	0.55	0.47
185	395	397	347	375	440	371	0.41	0.45	0.39
240	471	470	409	436	511	432	0.34	0.35	0.31
300	547	543	471	492	579	490	0.29	0.29	0.26
400	663	645	570	564	665	563	0.24	0.25	0.21
500	770	-	-	643	-	-	0.21	-	-
630	899	-	-	733	-	-	0.19	-	-
800	1038	-	-	825	-	-	0.18	-	-
1000	1211	-	-	924	-	-	0.16	-	-

**Table 7b CURRENT RATINGS FOR  
0.6 / 1 (1.2) kV ARMOURED XLPE CABLE**

Conductor Size (mm <sup>2</sup> )	Current Rating						Voltage Drop		
	In Air			In Ground			1C*	2C	3/4C
	1C*	2C	3/4C	1C*	2C	3/4C			
	(A)			(A)			(mV/ A/m)		
<b>Copper Conductor</b>									
1.5	28	29	25	36	40	33	27	31	27
2.5	37	39	33	47	52	43	16	19	16
4	48	52	44	61	67	56	10	12	10
6	60	66	56	75	84	70	6.8	7.9	6.8
10	82	90	78	100	113	94	4.0	4.7	4.0
16	106	115	99	127	141	119	2.5	2.9	2.5
25	140	152	131	163	183	152	1.62	1.9	1.65
35	170	188	162	195	219	182	1.18	1.35	1.15
50	222	228	197	231	259	217	0.87	1.00	0.87
70	285	291	251	284	317	266	0.62	0.69	0.60
95	346	354	304	340	381	319	0.47	0.52	0.45
120	402	410	353	386	433	363	0.39	0.42	0.37
150	463	472	406	431	485	406	0.33	0.35	0.30
185	529	539	463	485	547	458	0.28	0.29	0.26
240	625	636	546	558	632	529	0.24	0.24	0.21
300	720	732	628	623	708	592	0.21	0.21	0.185
400	815	847	728	691	799	667	0.195	0.19	0.165
500	918	-	-	765	-	-	0.180	-	-
630	1027	-	-	841	-	-	0.170	-	-
800	1119	-	-	888	-	-	0.165	-	-
1000	1214	-	-	942	-	-	0.155	-	-
<b>Aluminium Conductor</b>									
6	49	52	44	61	69	57	10	12	10
10	63	67	57	77	87	73	6.8	7.9	6.8
16	82	85	74	98	108	91	4.2	4.8	4.2
25	108	112	98	127	138	116	2.7	3.1	2.7
35	132	138	120	151	165	139	1.95	2.2	1.95
50	162	166	145	177	196	165	1.45	1.65	1.45
70	207	211	185	218	241	203	0.98	1.15	0.97
95	252	254	224	260	288	244	0.74	0.84	0.72
120	292	303	264	296	343	278	0.60	0.66	0.58
150	337	345	305	331	385	311	0.49	0.55	0.47
185	391	412	350	374	437	353	0.41	0.45	0.39
240	465	473	418	433	507	409	0.34	0.35	0.31
300	540	540	488	486	572	461	0.29	0.29	0.26
400	625	628	562	563	655	534	0.24	0.25	0.21
500	714	-	-	629	-	-	0.21	-	-
630	801	-	-	701	-	-	0.19	-	-
800	890	-	-	777	-	-	0.18	-	-
1000	980	-	-	854	-	-	0.16	-	-

\* Single core cables with aluminium wire armour

**Table 8 CURRENT RATINGS FOR  
1.9 / 3.3 (3.6) kV ARMoured XLPE CABLE**

Conductor Size (mm <sup>2</sup> )	In Air			In Ground		
	Single Core*		3 Core	Single Core*		3 Core
	Trefoil	Flat		Trefoil	Flat	
	(A)	(A)	(A)	(A)	(A)	(A)
<b>Copper Conductor</b>						
50	230	287	204	222	230	207
70	288	357	257	271	279	254
95	353	434	315	324	331	305
120	411	492	365	366	369	345
150	468	553	415	409	409	387
185	534	622	476	460	454	436
240	630	715	560	528	512	502
300	717	793	640	589	560	563
400	817	851	734	651	595	633
500	924	929	-	720	641	-
630	1041	1007	-	789	684	-
800	1131	1054	-	831	703	-
1000	1227	1121	-	880	735	-
<b>Aluminium Conductor</b>						
50	173	217	155	170	176	158
70	216	270	194	208	215	194
95	264	328	237	248	256	233
120	308	377	276	282	288	265
150	350	424	313	315	320	297
185	402	483	360	355	359	336
240	475	561	425	410	409	389
300	544	631	489	460	453	439

\* Single core cables with aluminium wire armour

**Table 9 CURRENT RATINGS FOR ARMoured XLPE CABLE**

Conductor Size (mm <sup>2</sup> )	3.8 / 6.6 (7.2) kV TO 8.7 / 15 (17.5)				12.7 / 22 (24) kV TO 19 / 33 (36)			
	In Air		In Ground		In Air		In Ground	
	Single Core* Trefoil	3 Core	Single Core* Trefoil	3 Core	Single Core* Trefoil	3 Core	Single Core* Trefoil	3 Core
(A)	(A)	(A)	(A)	(A)	(A)	(A)	(A)	(A)
<b>Copper Conductor</b>								
50	235	220	220	210	245	225	220	210
70	285	270	270	255	300	275	270	255
95	360	330	320	300	360	330	320	295
120	415	375	360	340	425	380	360	335
150	470	430	410	380	485	430	410	375
185	540	490	460	430	550	490	460	420
240	640	570	530	490	650	570	530	480
300	740	650	600	540	740	650	600	530
400	840	740	680	600	850	740	690	590
500	990	-	750	-	980	-	760	-
630	1110	-	830	-	1130	-	850	-
800	1270	-	920	-	1280	-	930	-
<b>Aluminium Conductor</b>								
50	180	170	170	160	190	175	170	160
70	225	210	210	195	235	215	210	195
95	280	250	250	230	280	260	250	230
120	320	295	280	265	330	300	280	260
150	365	330	320	300	375	335	320	290
185	425	385	360	335	430	390	360	330
240	500	450	415	380	510	460	415	380
300	580	510	475	435	580	520	475	425
400	670	590	540	490	680	600	550	480
500	790	-	610	-	790	-	610	-
630	910	-	680	-	920	-	690	-
800	1060	-	770	-	1060	-	770	-

\* Copper wire screened

**Table 10 ELECTRICAL CHARACTERISTICS  
0.6 / 1 (1.2) kV ARMoured XLPE CABLE**

Conductor Size	Single core cables*				Multicore cable		
	A.C.resistance at 90°C		Reactance (50Hz)		A.C.resistance at 90°C		Reactance (50Hz)
	Copper	Aluminium	Trefoil	Flat#	Copper	Aluminium	
(mm <sup>2</sup> )	(Ohm/km)	(Ohm/km)	(Ohm/km)	(Ohm/km)	(Ohm/km)	(Ohm/km)	(Ohm/km)
1.5	15.4	-	0.182	0.271	15.4	-	0.103
2.5	9.45	-	0.169	0.252	9.45	-	0.097
4	5.88	-	0.158	0.236	5.88	-	0.091
6	3.93	5.91	0.148	0.222	3.93	5.91	0.087
10	2.33	3.95	0.137	0.206	2.33	3.95	0.082
16	1.47	2.45	0.129	0.196	1.47	2.45	0.081
25	0.927	1.54	0.122	0.185	0.927	1.54	0.079
35	0.668	1.11	0.116	0.175	0.668	1.11	0.077
50	0.494	0.822	0.106	0.164	0.494	0.822	0.076
70	0.342	0.568	0.103	0.161	0.342	0.568	0.075
95	0.247	0.411	0.098	0.156	0.247	0.411	0.073
120	0.197	0.325	0.096	0.154	0.197	0.325	0.073
150	0.160	0.265	0.096	0.154	0.160	0.265	0.073
185	0.128	0.211	0.096	0.154	0.128	0.211	0.073
240	0.0989	0.162	0.092	0.150	0.0989	0.162	0.072
300	0.0802	0.130	0.090	0.148	0.0802	0.130	0.072
400	0.0640	0.103	0.090	0.148	0.0640	0.103	0.069
500	0.0515	0.081	0.089	0.146	0.0515	-	-
630	0.0420	0.065	0.086	0.144	0.0420	-	-
800	0.0363	0.053	0.086	0.144	0.0363	-	-
1000	0.0316	0.045	0.084	0.142	0.0316	-	-

**Table 11 ELECTRICAL CHARACTERISTICS  
1.9 / 3.3 (3.6) kV ARMoured XLPE CABLE**

Conductor Size	Single core cables*				3 core cable		
	A.C.resistance at 90°C		Reactance (50Hz)		A.C.resistance at 90°C		Reactance (50Hz)
	Copper	Aluminium	Trefoil	Flat#	Copper	Aluminium	
(mm <sup>2</sup> )	(Ohm/km)	(Ohm/km)	(Ohm/km)	(Ohm/km)	(Ohm/km)	(Ohm/km)	(Ohm/km)
16	1.47	2.45	0.140	0.197	1.47	2.45	0.104
25	0.907	1.54	0.133	0.189	0.907	1.54	0.095
35	0.668	1.11	0.126	0.181	0.668	1.11	0.092
50	0.494	0.822	0.116	0.172	0.494	0.822	0.088
70	0.342	0.568	0.110	0.165	0.342	0.568	0.084
95	0.247	0.411	0.104	0.160	0.247	0.411	0.081
120	0.197	0.325	0.104	0.159	0.197	0.325	0.079
150	0.160	0.265	0.100	0.156	0.160	0.265	0.077
185	0.128	0.211	0.098	0.154	0.128	0.211	0.076
240	0.0989	0.162	0.094	0.150	0.0989	0.162	0.074
300	0.0802	0.130	0.091	0.147	0.0802	0.130	0.073
400	0.0640	0.103	0.090	0.147	0.0640	0.103	0.070
500	0.0515	0.081	0.089	0.145	-	-	-
630	0.0420	0.065	0.086	0.143	-	-	-

\* Aluminium wire armoured

# Twice cable diameter spacing between centres

**Table 12 ELECTRICAL CHARACTERISTICS  
3.8 / 6.6 (7.2) kV AND 6.35 / 11 (12) kV ARMoured XLPE CABLE**

Conductor Size (mm <sup>2</sup> )	Single core cables*					3 core cable			
	A.C.resistance at 90°C		Reactance (50Hz)		Capacitance	A.C.resistance at 90°C		Reactance (50Hz)	Capacitance
	Copper	Aluminium	Trefoil	Flat#		Copper	Aluminium		
	(Ohm/km)	(Ohm/km)	(Ohm/km)	(Ohm/km)	(uF/km)	(Ohm/km)	(Ohm/km)	(Ohm/km)	(uF/km)
<b>3.8 / 6.6 (7.2) kV</b>									
50	0.494	0.822	0.121	0.181	0.34	0.493	0.822	0.105	0.36
70	0.342	0.568	0.115	0.174	0.38	0.343	0.568	0.100	0.41
95	0.247	0.411	0.109	0.167	0.43	0.247	0.411	0.095	0.46
120	0.196	0.325	0.105	0.162	0.47	0.196	0.325	0.092	0.50
150	0.159	0.265	0.102	0.159	0.51	0.159	0.265	0.090	0.55
185	0.128	0.211	0.099	0.156	0.56	0.128	0.211	0.087	0.60
240	0.0982	0.162	0.096	0.153	0.61	0.0986	0.162	0.085	0.65
300	0.0791	0.130	0.094	0.151	0.62	0.0798	0.130	0.084	0.67
400	0.0632	0.102	0.092	0.149	0.65	0.0641	0.102	0.082	0.70
500	0.0510	0.0804	0.089	0.147	0.69	-	-	-	-
630	0.0417	0.0639	0.086	0.144	0.78	-	-	-	-
<b>6.35 / 11 (12) kV</b>									
50	0.494	0.822	0.127	0.185	0.26	0.493	0.822	0.111	0.28
70	0.342	0.568	0.120	0.177	0.30	0.342	0.568	0.106	0.32
95	0.247	0.411	0.114	0.171	0.33	0.247	0.410	0.100	0.36
120	0.196	0.325	0.109	0.166	0.36	0.196	0.325	0.097	0.39
150	0.159	0.265	0.106	0.163	0.39	0.159	0.265	0.094	0.42
185	0.128	0.211	0.103	0.160	0.43	0.128	0.211	0.092	0.46
240	0.0981	0.161	0.099	0.156	0.48	0.0984	0.161	0.089	0.51
300	0.0791	0.130	0.096	0.153	0.52	0.0797	0.130	0.086	0.56
400	0.0632	0.102	0.093	0.150	0.58	0.0639	0.102	0.083	0.62
500	0.0510	0.0804	0.090	0.147	0.66	-	-	-	-
630	0.0417	0.0639	0.087	0.145	0.74	-	-	-	-

\* Copper wire screened

# Twice cable diameter spacing between centres



**Table 13 ELECTRICAL CHARACTERISTICS  
8.7 / 15 (17.5) kV AND 12.7 / 22 (24) kV ARMOURED XLPE CABLE**

Conductor Size (mm <sup>2</sup> )	Single core cables*					3 core cable			
	A.C.resistance at 90°C		Reactance (50Hz)		Capacitance	A.C.resistance at 90°C		Reactance (50Hz)	Capacitance
	Copper	Aluminium	Trefoil	Flat#		Copper	Aluminium		
	(Ohm/km)	(Ohm/km)	(Ohm/km)	(Ohm/km)	(uF/km)	(Ohm/km)	(Ohm/km)	(Ohm/km)	(uF/km)
<b>8.7 / 15 (17.5) kV</b>									
50	0.494	0.822	0.132	0.190	0.21	0.493	0.822	0.118	0.23
70	0.342	0.568	0.125	0.183	0.24	0.342	0.568	0.112	0.26
95	0.247	0.411	0.119	0.176	0.27	0.247	0.410	0.106	0.29
120	0.196	0.325	0.114	0.171	0.29	0.196	0.325	0.102	0.31
150	0.159	0.265	0.111	0.168	0.31	0.159	0.264	0.100	0.34
185	0.128	0.211	0.107	0.164	0.34	0.128	0.211	0.097	0.37
240	0.0979	0.161	0.103	0.160	0.38	0.0982	0.161	0.093	0.41
300	0.0790	0.130	0.100	0.156	0.41	0.0794	0.130	0.090	0.45
400	0.0630	0.102	0.097	0.153	0.46	0.0636	0.102	0.087	0.50
500	0.0507	0.0802	0.093	0.151	0.51	-	-	-	-
630	0.0413	0.0636	0.090	0.147	0.57	-	-	-	-
<b>12.7 / 22 (24) kV</b>									
50	0.494	0.822	0.137	0.192	0.18	0.493	0.822	0.124	0.20
70	0.342	0.568	0.130	0.185	0.21	0.342	0.568	0.118	0.22
95	0.247	0.411	0.123	0.178	0.23	0.247	0.410	0.111	0.24
120	0.196	0.325	0.118	0.173	0.25	0.196	0.325	0.107	0.26
150	0.159	0.265	0.115	0.170	0.27	0.159	0.264	0.104	0.28
185	0.128	0.211	0.111	0.165	0.29	0.127	0.211	0.101	0.31
240	0.098	0.161	0.106	0.161	0.32	0.098	0.161	0.097	0.34
300	0.079	0.130	0.103	0.158	0.35	0.079	0.130	0.094	0.37
400	0.063	0.102	0.0995	0.155	0.39	0.063	0.102	0.090	0.41
500	0.051	0.080	0.0959	0.152	0.43	-	-	-	-
630	0.041	0.064	0.0923	0.149	0.48	-	-	-	-

\*Copper wire screened

# Twice cable diameter spacing between centres

**Table 14 ELECTRICAL CHARACTERISTICS  
19 / 33 (36) kV ARMOURED XLPE CABLE**

Conductor Size (mm <sup>2</sup> )	Single core cables*					3 core cable			
	A.C.resistance at 90°C		Reactance (50Hz)		Capacitance	A.C.resistance at 90°C		Reactance (50Hz)	Capacitance
	Copper	Aluminium	Trefoil	Flat#		Copper	Aluminium		
	(Ohm/km)	(Ohm/km)	(Ohm/km)	(Ohm/km)	(uF/km)	(Ohm/km)	(Ohm/km)	(Ohm/km)	(uF/km)
70	0.342	0.568	0.143	0.194	0.16	0.342	0.568	0.129	0.15
95	0.247	0.411	0.136	0.189	0.18	0.247	0.410	0.122	0.17
120	0.196	0.325	0.130	0.184	0.19	0.196	0.324	0.117	0.18
150	0.160	0.265	0.127	0.178	0.20	0.159	0.265	0.114	0.20
185	0.127	0.211	0.122	0.174	0.22	0.127	0.211	0.110	0.21
240	0.0976	0.161	0.117	0.169	0.24	0.0978	0.161	0.106	0.25
300	0.0785	0.129	0.113	0.166	0.26	0.0789	0.129	0.102	0.27
400	0.0624	0.101	0.109	0.162	0.29	0.0629	0.102	0.098	0.30
500	0.0500	0.0797	0.104	0.158	0.32	-	-	-	-
630	0.0405	0.0630	0.100	0.155	0.35	-	-	-	-
800	0.0388	0.0509	0.095	0.151	0.40	-	-	-	-

\*Copper wire screened

# Twice cable diameter spacing between centres

**Table 15 BENDING RADIUS**

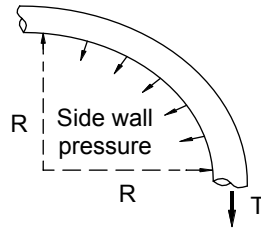
MINIMUM BENDING RADIUS		
FOR VOLTAGE 1 kV UP TO AND INCLUDING 3.3kV		
	During installation	Fixed installation
<b>Unarmoured cable</b>		
- Circular conductor	6D	6D
- Shaped conductor	8D	8D
<b>Armoured cable</b>		
- Circular conductor	6D	6D
- Shaped conductor	8D	8D
FOR VOLTAGE 6.6 kV UP TO AND INCLUDING 33kV		
<b>Unarmoured cable</b>		
- Single core	20D	15D
- Three core	15D	12D
<b>Armoured cable</b>		
- Single core	15D	12D
- Three core	12D	10D

Note : \* D is overall cable diameter

**Table 16 SIDE WALL PRESSURE**

Permissible maximum side wall pressure to the cable at bending point during installation is 500 kgf/m.

$$\text{Side wall pressure to cable} = \frac{\text{Puling tension (kgf)}}{\text{Bending radius (m)}} = \frac{T}{R}$$



**Table 17 COPPER SCREEN FOR SINGLE CORE UNARMOURED CABLES FOR VOLTAGE 6.6kV UP TO AND INCLUDING 33kV**

For single core unarmoured cables it is common practice to provide copper screen of minimum cross-sectional area as indicated below, unless specific by earth fault requirements of the system.

Conductor cross section (mm <sup>2</sup> )	Copper screen area (mm <sup>2</sup> )
50 - 120	16
150 - 300	25
400 - 630	35
800 and above	50

**Table 18 PERMISSIBLE MAXIMUM PULLING FORCE ( P )**

Means of pulling	Type of cable	Formula	Factor
With pulling eye attached to the conductors	All types of cables	$P = \sigma \cdot A$	$\sigma = 70\text{N/mm}^2$ (Copper conductor) $\sigma = 40\text{N/mm}^2$ (Aluminium conductor)
With pulling Stocking	Un-armoured cables*	$P = \sigma \cdot A$	$\sigma = 50\text{N/mm}^2$ (Copper conductor) $\sigma = 30\text{N/mm}^2$ (Aluminium conductor)
	Armoured cables**	$P = k \cdot d^2$	$k = 9\text{N/mm}^2$
	Lead sheath cables	$P = k \cdot d^2$	$k = 3\text{N/mm}^2$

\* When pulling 3 single core cables simultaneously with a common pulling stocking, the same maximum pulling force applies, whereas the pulling force 3 laid-up single core cables is 3 times that of a single core and for 3 non-laid-up single core cables is 2 times that of a single core

\*\* Not applicable for high voltage cables

P = Permissible maximum pulling force in N

A = Total cross sectional area in  $\text{mm}^2$  of all conductors (but not screen or concentric conductor)

d = Outside diameter of cable in mm

$\sigma$  = Permissible tensile stress of conductor in  $\text{N/mm}^2$

k = Empirically derived factor in  $\text{N/mm}^2$

Note : At no time should the pulling force exceed 25 kN

**Table 19 PERMISSIBLE RADIAL LOAD**

Permissible radial loads for pulling through pipes	
Non-Armoured Cables	10000N/m
Cables with Single Armour	15000N/m
Maximum permissible loads on rollers fitted on bends	
Non-Armoured Cables	1500N/m
Cables with Single Armour	2500N/m
When using roller chain (5 rollers / m)	
Non-Armoured Cables	7500N/m
Cables with Single Armour	12500N/m
When only 3 rollers / m are fitted	
Non-Armoured Cables	4500N/m
Cables with Single Armour	7500N/m

**Table 20 METRIC CONDUCTOR SIZES AND RESISTANCES ( at 20°C )**

Conductor Size (mm <sup>2</sup> )	Minimum number of wires in the conductor						Maximum d.c.resistance		
	Circular conductor		Circular compacted stranded		Shaped Conductor		Plain Copper	Metal Coated Copper	Aluminium*
	Cu	A1	Cu	A1	Cu	A1	(ohm / km)	(ohm / km)	(ohm / Km)
0.5	7	-	-	-	-	-	36.0	36.7	-
0.75	7	-	-	-	-	-	24.5	24.8	-
1	7	-	-	-	-	-	18.1	18.2	-
1.5	7	-	6	-	-	-	12.1	12.2	-
2.5	7	-	6	-	-	-	7.41	7.56	-
4	7	7	6	-	-	-	4.61	4.70	7.41
6	7	7	6	-	-	-	3.08	3.11	4.61
10	7	7	6	-	-	-	1.83	1.84	3.08
16	7	7	6	6	-	-	1.15	1.16	1.91
25	7	7	6	6	6	6	0.727	0.734	1.20
35	7	7	6	6	6	6	0.524	0.529	0.868
50	19	19	6	6	6	6	0.387	0.391	0.641
70	19	19	12	12	12	12	0.268	0.270	0.443
95	19	19	15	15	15	15	0.193	0.195	0.320
120	37	37	18	15	18	15	0.153	0.154	0.253
150	37	37	18	15	18	15	0.124	0.126	0.206
185	37	37	30	30	30	30	0.0991	0.100	0.164
240	37	37	34	30	34	30	0.0754	0.0762	0.125
300	61	61	34	30	34	30	0.0601	0.0607	0.100
400	61	61	53	53	53	53	0.0470	0.0475	0.0778
500	61	61	53	53	53	53	0.0366	0.0369	0.0605
630	91	91	53	53	53	53	0.0283	0.0286	0.0469
800	91	91	53	53	-	-	0.0221	0.0224	0.0367
1000	91	91	53	53	-	-	0.0176	0.0177	0.0291

\* includes metal-coated and metal clad

Except where stated, the data is in accordance with IEC 60228 and BS 6360.

**Table 21 TEMPERATURE CORRECTION FACTORS FOR CONDUCTOR RESISTANCE**

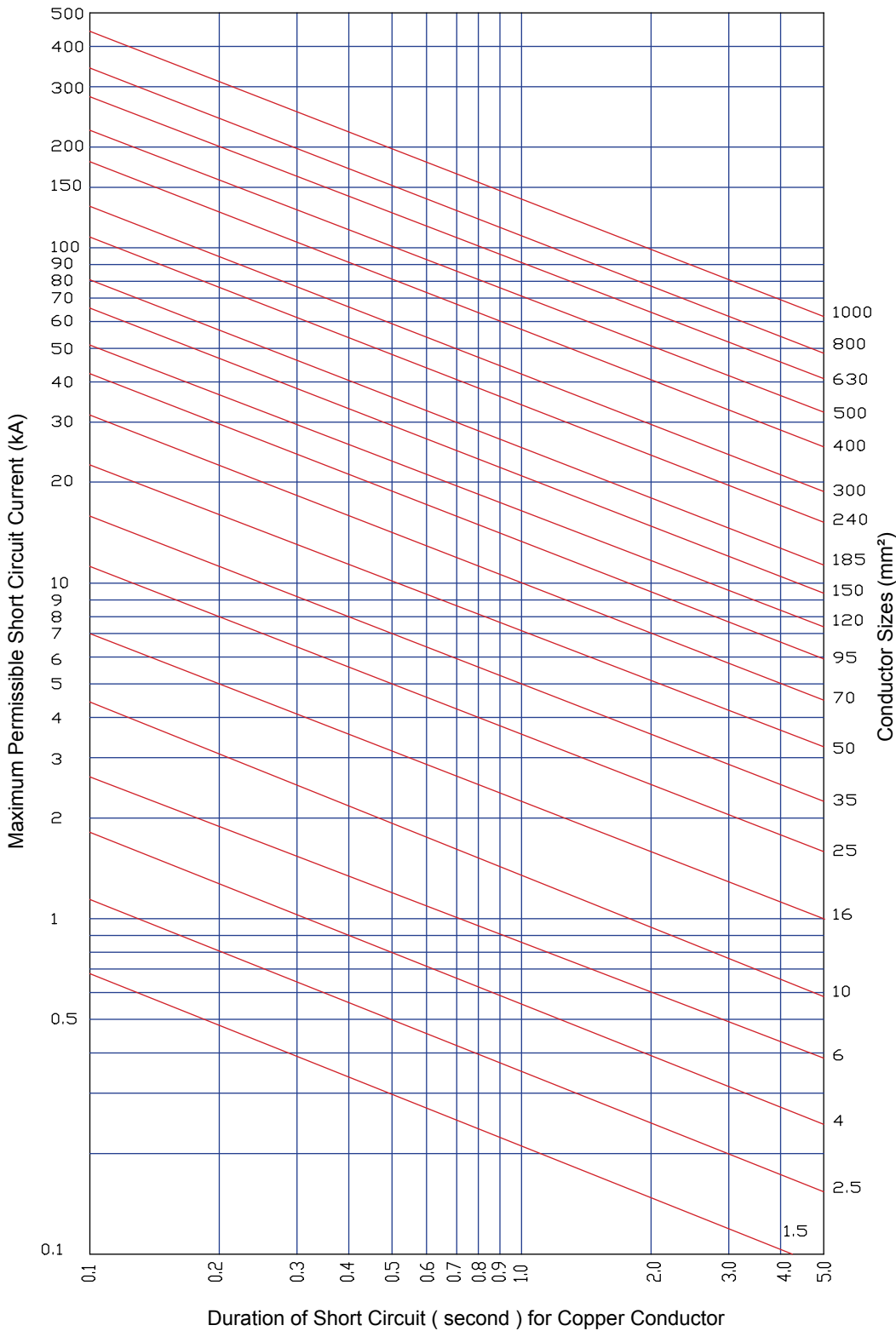
Temperature of conductor (°C)	Factor to convert to 20°C	Reciprocal to convert from 20°C
5	1.064	0.940
6	1.059	0.944
7	1.055	0.948
8	1.050	0.952
9	1.046	0.956
10	1.042	0.960
11	1.037	0.964
12	1.033	0.968
13	1.029	0.972
14	1.025	0.976
15	1.020	0.980
16	1.016	0.984
17	1.012	0.988
18	1.008	0.992
19	1.004	0.996
20	1.000	1.000
21	0.996	1.004
22	0.992	1.008
23	0.988	1.012
24	0.984	1.016
25	0.980	1.020
26	0.977	1.024
27	0.973	1.028
28	0.969	1.032
29	0.965	1.036
30	0.962	1.040
31	0.958	1.044
32	0.954	1.048
33	0.951	1.052
34	0.947	1.056
35	0.943	1.060
40	0.926	1.080
45	0.909	1.100
50	0.893	1.120
55	0.877	1.140
60	0.862	1.160
65	0.847	1.180
70	0.833	1.200
75	0.820	1.220
80	0.806	1.240
85	0.794	1.260
90	0.781	1.280

## SHORT CIRCUIT CURRENT FOR XLPE CABLES (COPPER CONDUCTOR)

Curves are based on :

\* Cables was at maximum operating temperature of 90°C at the start of short-circuit.

\* Final conductor temperature of 250°C



Conductor size (mm <sup>2</sup> )	Short circuit current (1s) (kA)
1.5	0.21
2.5	0.36
4	0.57
6	0.86
10	1.43
16	2.29
25	3.58
35	5.01
50	7.15
70	10.02
95	13.59
120	17.17
150	21.46
185	26.47
240	34.34
300	42.92
400	57.23
500	71.54
630	90.14
800	114.46
1000	143.08

Note:

For any other duration 't' seconds, please divide the given value by  $\sqrt{t}$

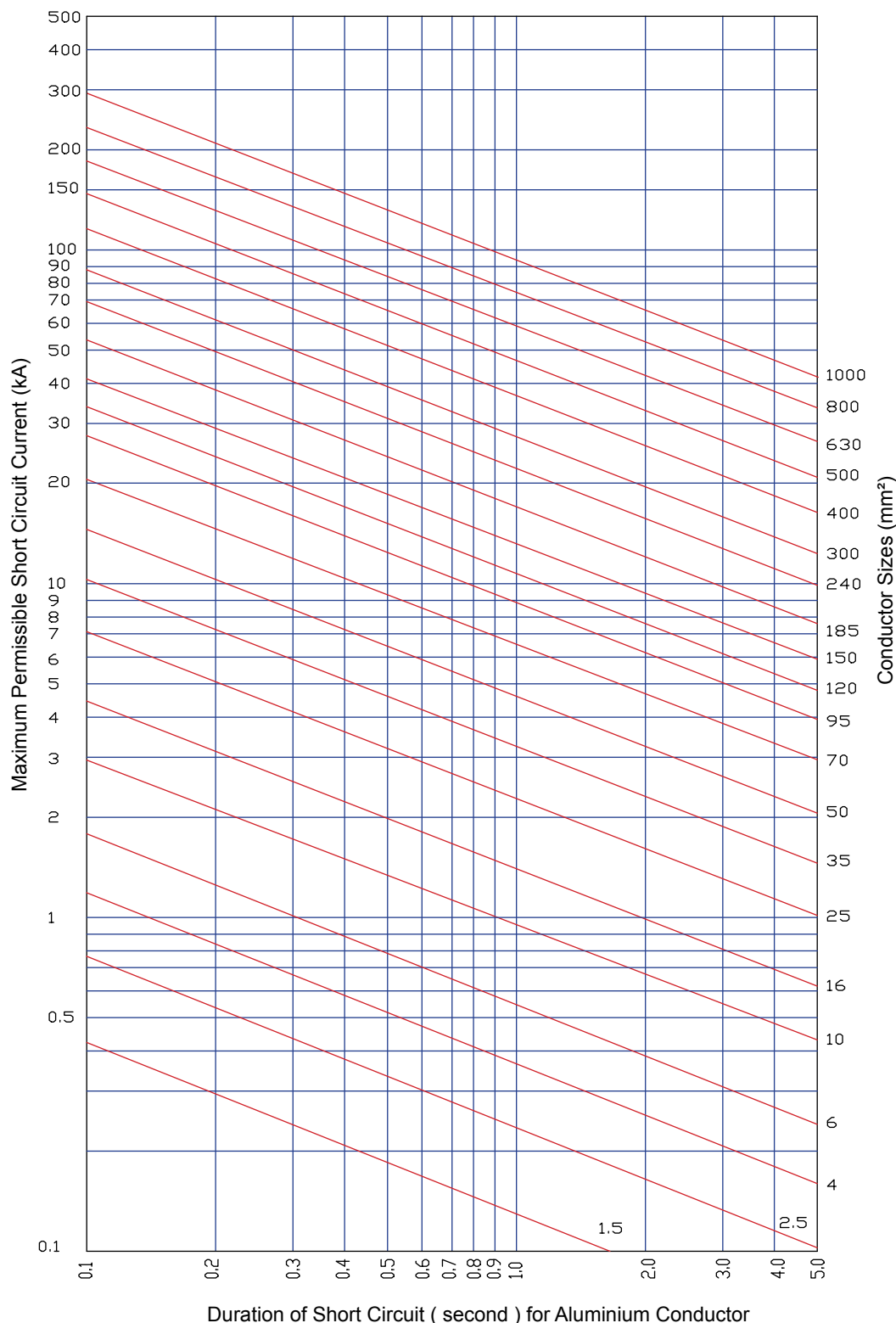
$$I = \frac{143.08 \times \text{size}(\text{mm}^2)}{\sqrt{t}}$$

## SHORT CIRCUIT CURRENT FOR XLPE CABLES (ALUMINIUM CONDUCTOR)

Curves are based on :

\* Cables was at maximum operating temperature of 90°C at the start of short-circuit.

\* Final conductor temperature of 250°C



Conductor size (mm <sup>2</sup> )	Short circuit current (1s) (kA)
1.5	0.14
2.5	0.24
4	0.38
6	0.57
10	0.94
16	1.51
25	2.36
35	3.31
50	4.72
70	6.61
95	8.98
120	11.34
150	14.17
185	17.48
240	22.68
300	28.34
400	37.79
500	47.24
630	59.52
800	75.58
1000	94.48

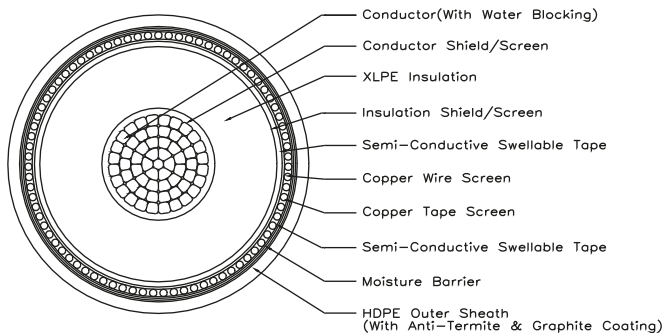
Note:

For any other duration 't' seconds, please divide the given value by  $\sqrt{t}$

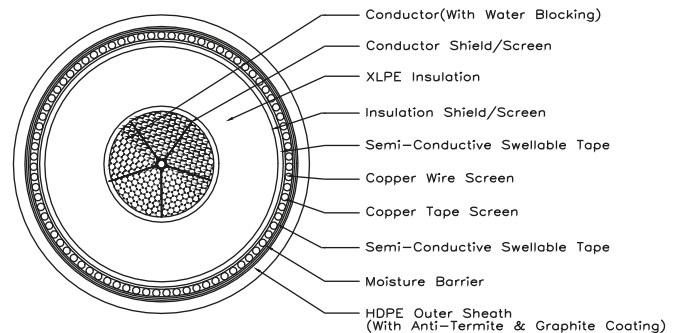
$$I = \frac{94.48 \times \text{size}(\text{mm}^2)}{\sqrt{t}}$$

# CU(WB) or AL(WB)/XLPE/SCW/HDPE CABLE 76/132(145)kV To IEC60840 & TNB XLPE INSULATED COPPER WIRE SCREENED HDPE SHEATHED CABLE

Circular Compacted



Segment Stranded (Milliken)



## DESCRIPTION

Circular compacted or segment stranded (Milliken) copper or aluminium (Water Blocking) conductor, XLPE insulated, with copper wire screened and HDPE outer sheath. Complies with Tenaga Nasional Berhad (TNB) Specification.

## CONSTRUCTION

### 1 Conductor

The conductor shall consist of circular compacted or segment stranded (Milliken) copper or aluminium wires. Water blocking shall be provided within the conductor strands by addition of swellable yarn and tape material.

### 2 Conductor Shield / Screen

The conductor shield / screen shall consist of an extruded layer of black, super-smooth thermosetting semi-conducting compound.

### 3 Insulation

The insulation shall consist of a homogeneous extrusion of " Super-clean " cross-linked polyethylene (XLPE).

### 4 Insulation Shield / Screen

#### a Non-metallic part

The insulation shield /screen shall consist of an extruded layer of black, super-smooth thermosetting semi-conducting compound.

The conductor shield/screen, insulation and insulation shield/screen are extruded by simultaneous triple extrusion process.

#### b Metallic part

Concentric round uncoated copper wires shall be applied helically and shall be capable of carrying a fault current of 31.5kA for 3 seconds.

A suitable equalizing tape shall be applied helically over the concentric wires.

### 5 Radial Moisture Barrier

Laminated Aluminium Tape shall be applied longitudinally.

### 6 Outer Sheath

The outer sheath shall be of extruded HDPE with anti-termite additive and shall have a baked-on graphite conducting layer.

## APPLICATIONS

For installation on trays, tunnel, ducts or direct burial.



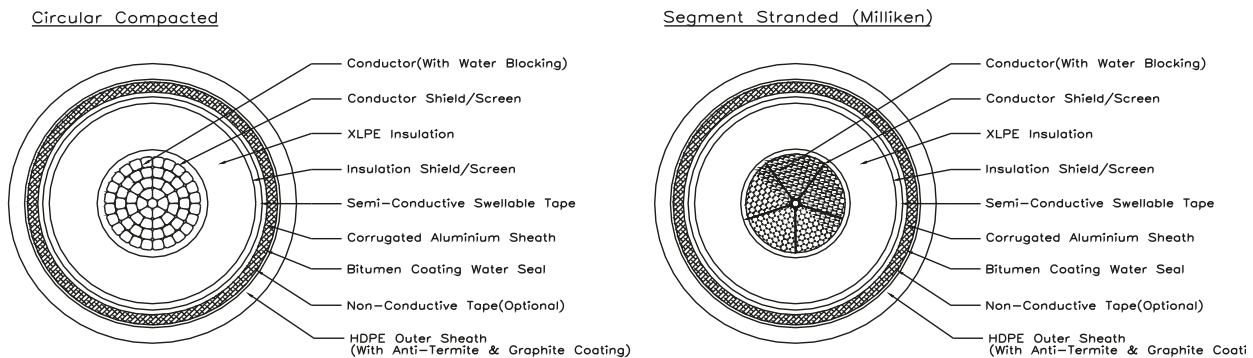
**CU(WB)/XLPE/SCW/HDPE CABLE [76/132(145)kV] TO IEC60840 & TNB Specification**

Code	Nominal Cross-Sectional Area of Conductor	Conductor Shape	Diameter of Copper Conductor (CU)	Nominal Thickness of XLPE Insulation	Earth Fault Current Carrying Capacity of Metallic Screen	Nominal Thickness of HDPE Sheath	Approx. Overall Diameter of Cable	Approx. Weight of Cable
	mm <sup>2</sup>		mm	mm		mm		
H1HBC01400CW00IT	400	Circular Compacted	23.3	20	31.5kA at 3 seconds (75~200 °C)	4.0	87	11490
H1HBC01500CW00IT	500		26.2				90	12630
H1HBC01630CW00IT	630		29.8				93	14130
H1HBC01800CW00IT	800		34.1				97	16010
H1HBC01A10MW00IT	1000	Segment Stranded (Milliken)	39.5				105	18580
H1HBC01A12MW00IT	1200		43.4				109	20740
H1HBC01A16MW00IT	1600		50.0				116	24890

**AL(WB)/XLPE/SCW/HDPE CABLE [76/132(145)kV] TO IEC60840 & TNB Specification**

Code	Nominal Cross-Sectional Area of Conductor	Conductor Shape	Diameter of Copper Conductor (AL)	Nominal Thickness of XLPE Insulation	Earth Fault Current Carrying Capacity of Metallic Screen	Nominal Thickness of HDPE Sheath	Approx. Overall Diameter of Cable	Approx. Weight of Cable
	mm <sup>2</sup>		mm	mm		mm		
H2HBC01630CW00IT	630	Circular Compacted	29.8	20	31.5kA at 3 seconds (75~200 °C)	4.0	93	10230
H2HBC01800CW00IT	800		34.1				97	11050
H2HBC01A10MW00IT	1000	Segment Stranded (Milliken)	39.5				105	12390
H2HBC01A12MW00IT	1200		43.4				109	13310
H2HBC01A16MW00IT	1600		50.0				116	14990

# CU(WB) or AL(WB)/XLPE/CAS/HDPE CABLE 160/275(300)kV To IEC62067 & TNB XLPE INSULATED CORRUGATED ALUMINIUM SHEATH & HDPE SHEATHED CABLE



## DESCRIPTION

Circular compacted or segment stranded (Milliken) copper or aluminium (Water Blocking) conductor, XLPE insulated, with corrugated aluminium sheath and HDPE outer sheath. Complies with Tenaga Nasional Berhad (TNB) Specification.

## CONSTRUCTION

### 1 Conductor

The conductor shall consist of circular compacted or segment stranded (Milliken) copper or aluminium wires. Water blocking shall be provided within the conductor strands by addition of swellable yarn and tape material.

### 2 Conductor Shield / Screen

The conductor shield / screen shall consist of an extruded layer of black, super-smooth thermosetting semi-conducting compound.

### 3 Insulation

The insulation shall consist of a homogeneous extrusion of " Super-clean " cross-linked polyethylene (XLPE).

### 4 Insulation Shield / Screen

The insulation shield /screen shall consist of an extruded layer of black, super-smooth thermosetting semi-conducting compound. The conductor shield/screen, insulation and insulation shield/screen are extruded by simultaneous triple extrusion process.

### 5 Swelling Tape

A semi-conductive non-biodegradable swellable tape shall be applied over the insulation shield / screen.

### 6 Metallic Sheath

The metallic part shall be provided by continuously welded corrugated aluminium sheath (CAS) in annular ring form.

### 7 Impervious Layer

A layer of bitumen shall be coated over the corrugated aluminium sheath. A separator may be applied.

### 8 Outer Sheath

The outer sheath shall be of extruded HDPE over the corrugated aluminium sheath with anti-termite additive. The outer surface of the HDPE sheath shall have a baked-on graphite conducting layer.

## APPLICATIONS

For installation on trays, tunnel, ducts or direct burial.

Note : Flame Retardant PVC outer sheath is available upon request

**CU(WB)/XLPE/CAS/HDPE CABLE [160/275(300)kV] TO IEC62067 & TNB Specification**

Code	Nominal Cross-Sectional Area of Conductor	Conductor Shape	Diameter of Copper Conductor (CU)	Nominal Thickness of XLPE Insulation	Nominal Thickness of Corrugated AL Sheath	Nominal Thickness of HDPE Sheath	Approx. Overall Diameter of Cable	Approx. Weight of Cable
	mm <sup>2</sup>		mm	mm	mm	mm	mm	Kg/Km
H1LGC01800CZ00I0	800	Compacted	33.7	27	2.4	7.0	132	19450
H1LGC01A10MZ00I0	1000	Segment Stranded (Milliken)	39.5				138	22160
H1LGC01A12MZ00I0	1200		43.4				142	24490
H1LGC01A14MZ00I0	1400		47.6				146	26900
H1LGC01A16MZ00I0	1600		50.1				148	29090
H1LGC01A20MZ00I0	2000		56.0				154	33530
H1LGC01A25MZ00I0	2500		60.2				159	38660

\* Metallic corrugated aluminium sheath (CAS) with earth fault current of 40kA at 3 seconds (75 ~ 200°C)

**AL(WB)/XLPE/CAS/HDPE CABLE [160/275(300)kV] TO IEC62067 & TNB Specification**

Code	Nominal Cross-Sectional Area of Conductor	Conductor Shape	Diameter of Copper Conductor (AL)	Nominal Thickness of XLPE Insulation	Nominal Thickness of Corrugated AL Sheath	Nominal Thickness of HDPE Sheath	Approx. Overall Diameter of Cable	Approx. Weight of Cable
	mm <sup>2</sup>		mm	mm	mm	mm	mm	Kg/Km
H2LGC01800CZ00I0	800	Compacted	33.7	27	2.4	7.0	132	14500
H2LGC01A10MZ00I0	1000	Segment Stranded (Milliken)	39.5				138	15970
H2LGC01A12MZ00I0	1200		43.4				142	17060
H2LGC01A14MZ00I0	1400		47.6				146	18230
H2LGC01A16MZ00I0	1600		50.1				148	19180
H2LGC01A20MZ00I0	2000		56.0				154	21150
H2LGC01A25MZ00I0	2500		60.2				159	23180

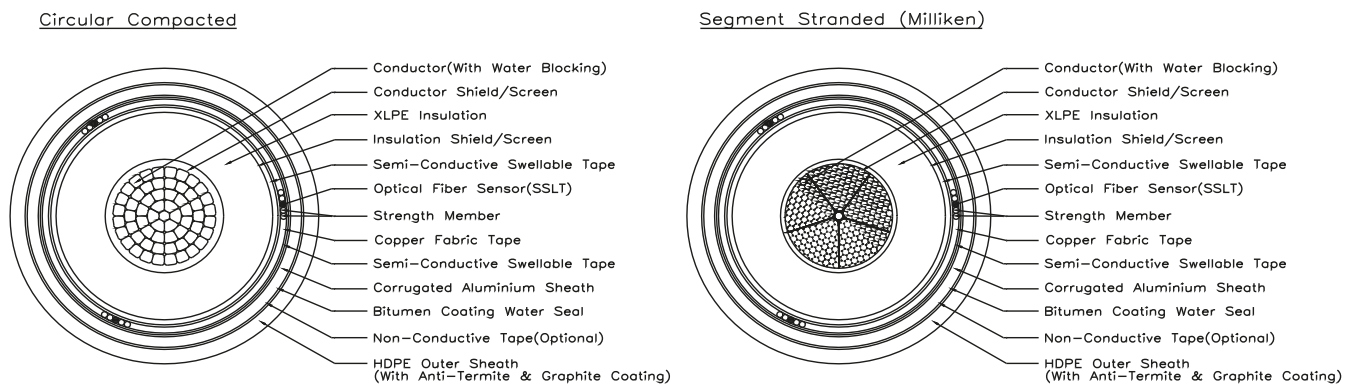
\* Metallic corrugated aluminium sheath (CAS) with earth fault current of 40kA at 3 seconds (75 ~ 200°C)

# CU(WB) or AL(WB)/XLPE/CAS/HDPE CABLE

160/275(300)kV To IEC62067

## XLPE INSULATED CORRUGATED ALUMINIUM SHEATH & HDPE SHEATHED CABLE

(With Optical Cable)



### DESCRIPTION

Circular compacted or segment stranded (Milliken) copper or aluminium (Water Blocking) conductor, XLPE insulated, in incorporated with optical cable, corrugated aluminium sheath and HDPE outer sheath.

### CONSTRUCTION

#### 1 Conductor

The conductor shall consist of circular compacted or segment stranded (Milliken) copper or aluminium wires. Water blocking shall be provided within the conductor strands by addition of swellable yarn and tape material.

#### 2 Conductor Shield / Screen

The conductor shield / screen shall consist of an extruded layer of black, super-smooth thermosetting semi-conducting compound.

#### 3 Insulation

The insulation shall consist of a homogeneous extrusion of " Super-clean " cross-linked polyethylene (XLPE).

#### 4 Insulation Shield / Screen

The insulation shield /screen shall consist of an extruded layer of black, super-smooth thermosetting semi-conducting compound. The conductor shield/screen, insulation and insulation shield/screen are extruded by simultaneous triple extrusion process.

#### 5 Swelling Tape

A semi-conductive non-biodegradable swellable tape shall be applied over the insulation shield / screen.

#### 6 Optical Fiber Sensor

Optical fibers shall be integrated in the stainless steel loose tube (SSLT) so that the temperature of the cable can be measured during operation.

#### 7 Metallic Sheath

The metallic part shall be provided by continuously welded corrugated aluminium sheath (CAS) in annular ring form.

#### 8 Impervious Layer

A layer of bitumen shall be coated over the corrugated aluminium sheath. A separator may be applied.

#### 9 Outer Sheath

The outer sheath shall be of extruded HDPE over the corrugated aluminium sheath with anti-termite additive. The outer surface of the HDPE sheath shall have a baked-on graphite conducting layer.

### APPLICATIONS

For installation on trays, tunnel, ducts or direct burial.

Note : Flame Retardant PVC outer sheath is available upon request

**CU(WB)/XLPE/CAS/HDPE CABLE (With Optical Cable) [160/275(300)kV] TO IEC62067**

Code	Nominal Cross-Sectional Area of Conductor	Conductor Shape	Diameter of Copper Conductor (CU)	Nominal Thickness of XLPE Insulation	Nominal Thickness of Corrugated AL Sheath	Nominal Thickness of HDPE Sheath	Approx. Overall Diameter of Cable	Approx. Weight of Cable
	mm <sup>2</sup>		mm	mm	mm	mm	mm	Kg/Km
H1LFC01800CZ00I0	800	Compacted	33.7	27	2.4	7.0	137	20480
H1LFC01A10MZ00I0	1000	Segment Stranded (Milliken)	39.5				143	23160
H1LFC01A12MZ00I0	1200		43.4				147	25530
H1LFC01A14MZ00I0	1400		47.6				151	27900
H1LFC01A16MZ00I0	1600		50.1				153	30100
H1LFC01A20MZ00I0	2000		56.0				159	34590
H1LFC01A25MZ00I0	2500		60.2				165	39780

\* Metallic corrugated aluminium sheath (CAS) with earth fault current of 40kA at 3 seconds (75 ~ 200°C)

**AL(WB)/XLPE/CAS/HDPE CABLE (With Optical Cable) [160/275(300)kV] TO IEC62067**

Code	Nominal Cross-Sectional Area of Conductor	Conductor Shape	Diameter of Copper Conductor (AL)	Nominal Thickness of XLPE Insulation	Nominal Thickness of Corrugated AL Sheath	Nominal Thickness of HDPE Sheath	Approx. Overall Diameter of Cable	Approx. Weight of Cable
	mm <sup>2</sup>		mm	mm	mm	mm	mm	Kg/Km
H2LFC01800CZ00I0	800	Compacted	33.7	27	2.4	7.0	137	15520
H2LFC01A10MZ00I0	1000	Segment Stranded (Milliken)	39.5				143	16970
H2LFC01A12MZ00I0	1200		43.4				147	18100
H2LFC01A14CZ00I0	1400		47.6				151	19240
H2LFC01A16MZ00I0	1600		50.1				153	20190
H2LFC01A20MZ00I0	2000		56.0				159	22210
H2LFC01A25MZ00I0	2500		60.2				165	24300

\* Metallic corrugated aluminium sheath (CAS) with earth fault current of 40kA at 3 seconds (75 ~ 200°C)

## CURRENT CARRYING CAPACITY

The Current Carrying Capacity given in the following tables are based on the assumption shown below :

- 1 **Maximum Conductor Temperature** : 90 °C
- 2 **Air Temperature** : 40 °C
- 3 **Ground Temperature** : 30 °C
- 4 **Soil Thermal Resistivity** : 1.2 °Cm/W
- 5 **Depth of Laying** : 1200 mm
- 6 **Cable Formation** : Trefoil or Flat (Touching)
- 7 **Frequency** : 50 Hz
- 8 **Load factor** : 100 %

## CONTINUOUS CURRENT RATINGS FOR SINGLE CIRCUIT

**Table A**  
**CU(WB) or AL(WB)/XLPE/SCW/HDPE CABLE [76/132(145)kV]**  
**TO IEC60840 & TNB Specification**

Conductor Size mm <sup>2</sup>	Copper Conductor				Aluminium Conductor			
	Direct Buried		In Air		Direct Buried		In Air	
	Trefoil	Flat	Trefoil	Flat	Trefoil	Flat	Trefoil	Flat
	A	A	A	A	A	A	A	A
400	593	595	792	807	-	-	-	-
500	674	676	912	930	-	-	-	-
630	764	766	1051	1072	607	609	835	852
800	857	859	1200	1225	690	692	966	986
1000	1001	1004	1426	1456	802	805	1143	1167
1200	1079	1083	1559	1592	879	882	1270	1297
1600	1227	1231	1813	1853	1027	1031	1517	1550

## CURRENT CARRYING CAPACITY

The Current Carrying Capacity given in the following tables are based on the assumption shown below :

<b>1 Maximum Conductor Temperature</b>	: 90 °C
<b>2 Air Temperature</b>	: 40 °C
<b>3 Ground Temperature</b>	: 30 °C
<b>4 Soil Thermal Resistivity</b>	: 1.2 °Cm/W
<b>5 Depth of Laying</b>	: 1500 mm
<b>6 Cable Formation</b>	: Trefoil or Flat (Touching)
<b>7 Frequency</b>	: 50 Hz
<b>8 Load factor</b>	: 100 %

## CONTINUOUS CURRENT RATINGS FOR SINGLE CIRCUIT

**Table B**  
**CU(WB) or AL(WB)/XLPE/CAS/HDPE CABLE [160/275(300)kV]**  
**TO IEC62067 & TNB Specification**

Conductor Size mm <sup>2</sup>	Copper Conductor				Aluminium Conductor			
	Direct Buried		In Air		Direct Buried		In Air	
	Trefoil	Flat	Trefoil	Flat	Trefoil	Flat	Trefoil	Flat
	A	A	A	A	A	A	A	A
800	760	755	1100	1072	630	627	898	887
1000	855	848	1282	1233	715	712	1052	1029
1200	904	894	1382	1320	770	765	1154	1123
1400	952	939	1486	1407	823	815	1259	1215
1600	989	972	1566	1471	867	856	1346	1289
2000	1048	1027	1708	1586	945	930	1510	1427
2500	1099	1075	1830	1683	999	983	1632	1528

## CURRENT CARRYING CAPACITY

The Current Carrying Capacity given in the following tables are based on the assumption shown below :

- 1 **Maximum Conductor Temperature** : 90 °C
- 2 **Air Temperature** : 40 °C
- 3 **Ground Temperature** : 30 °C
- 4 **Soil Thermal Resistivity** : 1.2 °Cm/W
- 5 **Depth of Laying** : 1500 mm
- 6 **Cable Formation** : Trefoil or Flat (Touching)
- 7 **Frequency** : 50 Hz
- 8 **Load factor** : 100 %

## CONTINUOUS CURRENT RATINGS FOR SINGLE CIRCUIT

**Table C**  
**CU(WB) or AL(WB)/XLPE/CAS/HDPE CABLE (With Optical Cable) [160/275(300)kV]**  
**TO IEC62067**

Conductor Size mm <sup>2</sup>	Copper Conductor				Aluminium Conductor			
	Direct Buried		In Air		Direct Buried		In Air	
	Trefoil	Flat	Trefoil	Flat	Trefoil	Flat	Trefoil	Flat
	A	A	A	A	A	A	A	A
800	759	753	1096	1068	629	626	894	883
1000	853	845	1277	1228	714	710	1047	1024
1200	902	892	1377	1315	769	763	1149	1117
1400	950	936	1480	1402	821	813	1253	1209
1600	988	969	1560	1467	866	854	1340	1283
2000	1048	1025	1703	1582	944	928	1503	1422
2500	1097	1071	1824	1677	997	979	1624	1520



## CORRECTION FACTORS FOR VARIOUS LAYING CONDITIONS

To determine the current carrying capacity of the cable for various laying conditions, the correction factors included should be applied.

**Table D.1 CORRECTION FACTORS FOR VARIOUS AMBIENT AIR TEMPERATURE**

Air Temperature	20 °C	25 °C	30 °C	35 °C	40 °C	45 °C	50 °C
Rating Factor	1.21	1.16	1.10	1.05	<b>1.00</b>	0.94	0.88

**Table D.2 CORRECTION FACTORS FOR VARIOUS AMBIENT GROUND TEMPERATURE**

Ground Temperature	20 °C	25 °C	30 °C	35 °C	40 °C	45 °C	50 °C
Rating Factor	1.08	1.04	<b>1.00</b>	0.96	0.92	0.87	0.82

**Table D.3 CORRECTION FACTORS FOR VARIOUS SOIL THERMAL RESISTIVITY**

Soil Thermal Resistivity	0.7 °Cm/W	1.0 °Cm/W	1.2 °Cm/W	1.5 °Cm/W	2.0 °Cm/W	2.5 °Cm/W	3.0 °Cm/W
Rating Factor	1.20	1.07	<b>1.00</b>	0.92	0.81	0.74	0.68

**Table D.4A CORRECTION FACTORS FOR DEPTH OF LAYING (132kV Cable)**

Conductor Size mm <sup>2</sup>	Depth of Laying (In trefoil formation, to centre of cable)				
	0.8 m	1.0 m	1.2 m	1.5 m	2.0 m
400 ~ 1000	1.05	1.03	<b>1.00</b>	0.97	0.94
1200 ~ 1600	1.06	1.03	<b>1.00</b>	0.96	0.93

**Table D.4B CORRECTION FACTORS FOR DEPTH OF LAYING (275kV Cable)**

Conductor Size mm <sup>2</sup>	Depth of Laying (In trefoil formation, to centre of cable)					
	0.8 m	1.0 m	1.2 m	1.5 m	2.0 m	2.5 m
800 ~ 1000	1.08	1.05	1.03	<b>1.00</b>	0.97	0.94
1200 ~ 2500	1.09	1.06	1.03	<b>1.00</b>	0.96	0.93

**Table D.5 CORRECTION FACTORS FOR PROXIMITY OF CIRCUIT**

Conductor Size mm <sup>2</sup>	Number of Cable System (600mm Axis-to-axis Spacing Between 2 Cable Systems)									
	1	2	3	4	5	6	7	8	9	10
630	<b>1.00</b>	0.87	0.79	0.76	0.73	0.71	0.70	0.69	0.68	0.67
800	<b>1.00</b>	0.87	0.79	0.75	0.72	0.70	0.69	0.68	0.67	0.66
1000	<b>1.00</b>	0.86	0.78	0.74	0.71	0.70	0.68	0.67	0.66	0.66
1200	<b>1.00</b>	0.86	0.78	0.74	0.71	0.69	0.67	0.66	0.65	0.65
1400	<b>1.00</b>	0.85	0.77	0.73	0.70	0.68	0.66	0.65	0.64	0.64
1600	<b>1.00</b>	0.85	0.77	0.73	0.70	0.68	0.66	0.65	0.64	0.64
2000	<b>1.00</b>	0.84	0.76	0.72	0.69	0.67	0.65	0.64	0.63	0.63
2500	<b>1.00</b>	0.84	0.75	0.71	0.68	0.66	0.65	0.64	0.63	0.62

A cable system is a set of 3 phase conductors (Lay in Trefoil Condition)

## ELECTRICAL CHARACTERISTICS

**Table E.1**  
**CU(WB) or AL(WB)/XLPE/SCW/HDPE CABL[76/132(145)kV]**  
**TO IEC60840 & TNB Specification**

Conductor	Single Core Cable						
	Copper Conductor		Aluminium Conductor		Capacitance	Inductance	Reactance (50Hz)
	DC Resistance (at 20°C)	AC Resistance (at 90°C)	DC Resistance (at 20°C)	AC Resistance (at 90°C)			
Size	ohm/km	ohm/km	ohm/km	ohm/km	uf/km	mH/km	ohm/km
mm <sup>2</sup>	ohm/km	ohm/km	ohm/km	ohm/km	uf/km	mH/km	ohm/km
400	0.0470	0.0617	-	-	0.155	0.451	0.142
500	0.0366	0.0489	-	-	0.166	0.434	0.136
630	0.0283	0.0391	0.0469	0.0618	0.179	0.416	0.131
800	0.0221	0.0320	0.0367	0.0493	0.194	0.398	0.125
1000	0.0176	0.0241	0.0291	0.0375	0.217	0.385	0.121
1200	0.0151	0.0212	0.0247	0.0319	0.231	0.373	0.117
1600	0.0113	0.0169	0.0186	0.0241	0.255	0.357	0.112

**Table E.2**  
**CU(WB) or AL(WB)/XLPE/CAS/HDPE CABLE [160/275(300)kV]**  
**TO IEC62067 & TNB Specification**

Conductor	Single Core Cable						
	Copper Conductor		Aluminium Conductor		Capacitance	Inductance	Reactance (50Hz)
	DC Resistance (at 20°C)	AC Resistance (at 90°C)	DC Resistance (at 20°C)	AC Resistance (at 90°C)			
Size	ohm/km	ohm/km	ohm/km	ohm/km	uf/km	mH/km	ohm/km
mm <sup>2</sup>	ohm/km	ohm/km	ohm/km	ohm/km	uf/km	mH/km	ohm/km
800	0.0221	0.0314	0.0367	0.0490	0.147	0.461	0.145
1000	0.0176	0.0239	0.0291	0.0375	0.161	0.438	0.138
1200	0.0151	0.0210	0.0247	0.0319	0.171	0.425	0.134
1400	0.0129	0.0185	0.0212	0.0274	0.181	0.412	0.130
1600	0.0113	0.0167	0.0186	0.0241	0.187	0.406	0.127
2000	0.0090	0.0142	0.0149	0.0194	0.202	0.391	0.123
2500	0.0072	0.0123	0.0127	0.0167	0.213	0.382	0.120

**Table E.3**  
**CU(WB) or AL(WB)/XLPE/CAS/HDPE CABLE (With Optical Cable) [160/275(300)kV]**  
**TO IEC62067**

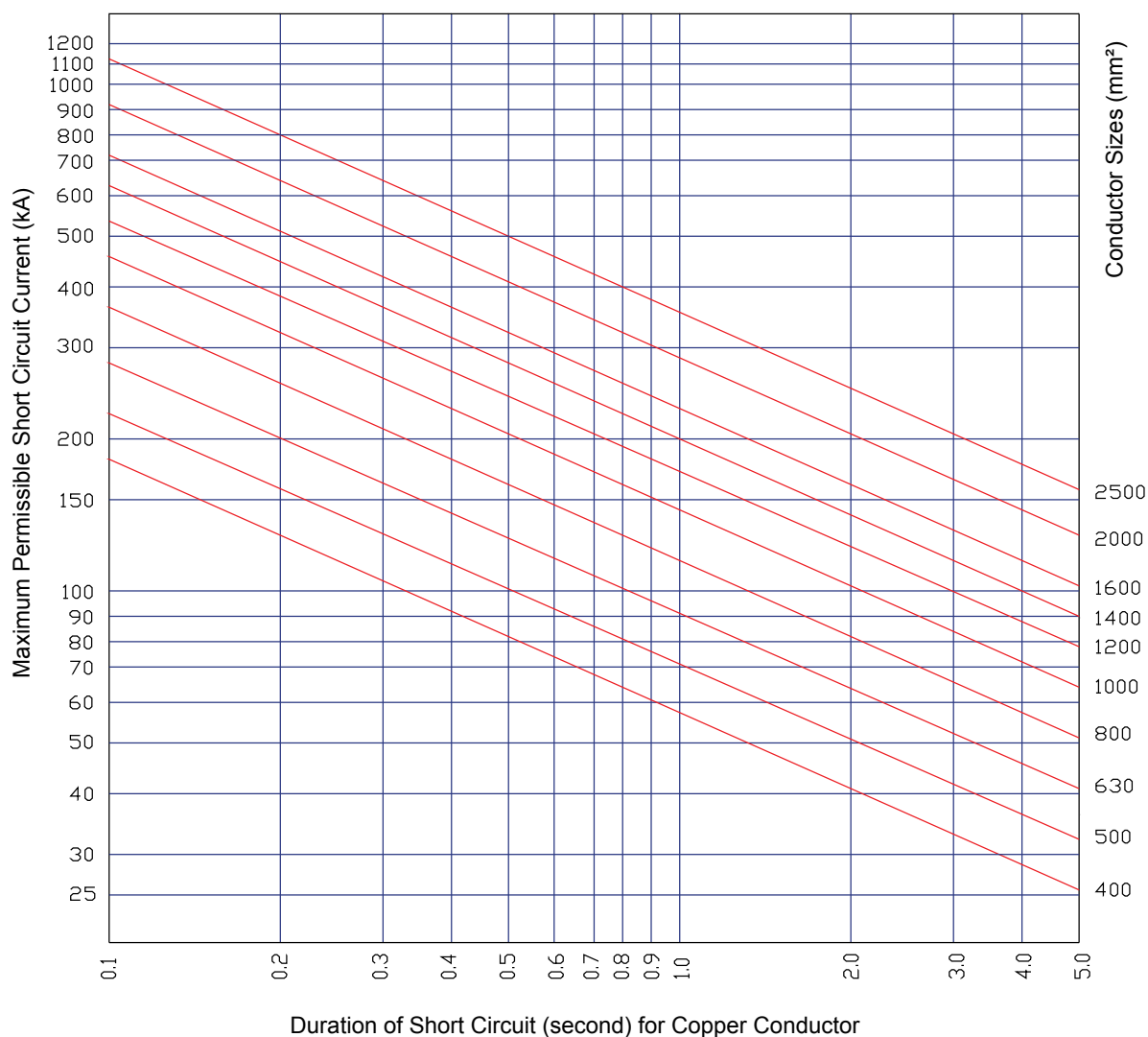
Conductor	Single Core Cable						
	Copper Conductor		Aluminium Conductor		Capacitance	Inductance	Reactance (50Hz)
	DC Resistance (at 20°C)	AC Resistance (at 90°C)	DC Resistance (at 20°C)	AC Resistance (at 90°C)			
Size	ohm/km	ohm/km	ohm/km	ohm/km	uf/km	mH/km	ohm/km
mm <sup>2</sup>	ohm/km	ohm/km	ohm/km	ohm/km	uf/km	mH/km	ohm/km
800	0.0221	0.0314	0.0367	0.0490	0.147	0.469	0.147
1000	0.0176	0.0239	0.0291	0.0375	0.161	0.446	0.140
1200	0.0151	0.0210	0.0247	0.0319	0.171	0.432	0.136
1400	0.0129	0.0185	0.0212	0.0274	0.181	0.419	0.132
1600	0.0113	0.0167	0.0186	0.0241	0.187	0.412	0.130
2000	0.0090	0.0142	0.0149	0.0194	0.202	0.398	0.125
2500	0.0072	0.0123	0.0127	0.0167	0.213	0.390	0.123

## SHORT CIRCUIT CURRENT FOR XLPE CABLES (COPPER CONDUCTOR)

Curves are based on :

\* Cables was at maximum operating temperature of 90°C at the start of short-circuit.

\* Final conductor temperature of 250°C



Conductor Size (mm <sup>2</sup> )	Short Circuit Current (I)	
	1 Second (kA)	3 Seconds (kA)
400	57	33
500	72	41
630	90	52
800	114	66
1000	143	83
1200	172	99
1400	200	116
1600	229	132
2000	286	165
2500	358	207

Short Circuit Current (kA) :

$$I = \frac{143.08 \times \text{'mm}^2\text{'}}{\sqrt{t}}$$

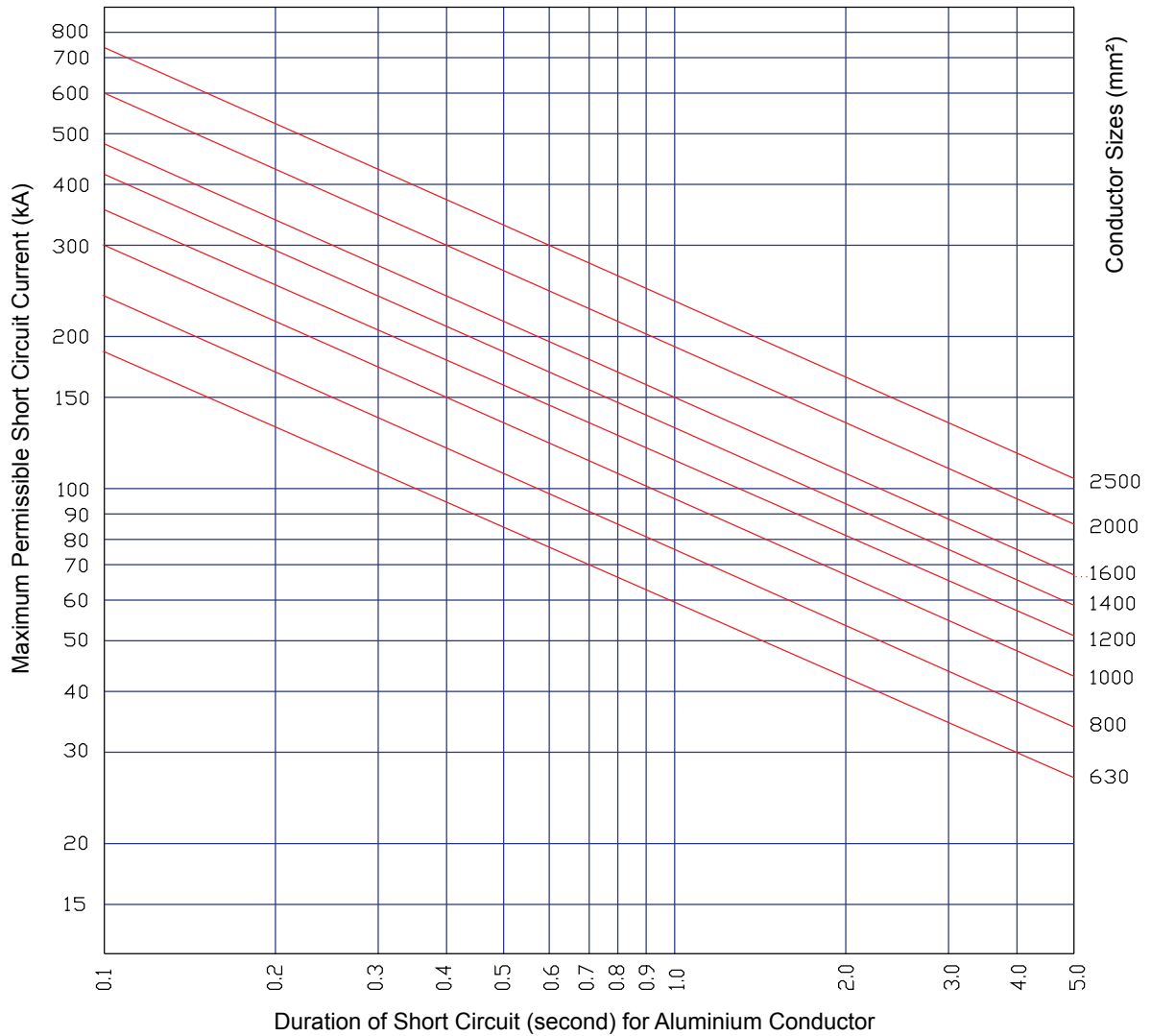
Note:

For any other conductor size 'mm<sup>2</sup>' & duration 't' seconds, please use above formula

## SHORT CIRCUIT CURRENT FOR ALUMINIUM CABLES (ALUMINIUM CONDUCTOR)

Curves are based on :

- \* Cables was at maximum operating temperature of 90°C at the start of short-circuit.
- \* Final conductor temperature of 250°C



Conductor Size (mm <sup>2</sup> )	Short Circuit Current (I)	
	1 Second (kA)	3 Seconds (kA)
630	60	34
800	76	44
1000	94	55
1200	113	65
1400	132	76
1600	151	87
2000	189	109
2500	236	136

Short Circuit Current (kA) :

$$I = \frac{94.48 \times \sqrt{\text{mm}^2}}{\sqrt{t}}$$

Note:

For any other conductor size 'mm<sup>2</sup>' & duration 't' seconds, please use above formula

# PUBLICATIONS REFERRED TO

IEC 60038	IEC Standard Voltages
IEC 60060	High Voltage Test Techniques
IEC 60183	Guidance For The Selection Of High Voltage Cable A.C. Cable Systems
IEC 60228	Conductors Of Insulated Cables
IEC 60229	Electric Cables - Test On Extruded Oversheaths With A Special Protective Function
IEC 60230	Impulse Test On Cables And Their Accessories
IEC 60287	Electric Cable -- Calculation Of The Current Rating
IEC 60332	Tests On Electric And Optical Fibre Cables Under Fire Conditions
IEC 60502	Power Cable With Extruded Insulation And Their Accessories For Rated Voltages From 1 kV ( $U_m = 1.2$ kV ) Up To 30 kV ( $U_m = 36$ kV )
IEC 60724	Short Circuit Temperature Limits Of Electric Cable With Rated Voltage Of 1kV ( $U_m = 1.2$ kV ) And 3 kV ( $U_m = 3.6$ kV )
IEC 60811	Common Test Methods For Insulating And Sheathing Materials Of Electric Cables And Optical Cables.
IEC 60840	Power Cable With Extruded Insulation And Their Accessories For Rated Voltages Above 30 kV ( $U_m = 36$ kV ) Up To 150 kV ( $U_m = 170$ kV )
IEC 60885	Electrical Test Methods For Electric Cables
IEC 60949	Calculation Of Thermally Permissible Short Circuit Currents, Taking Account Non-adiabatic Heating Effect
IEC 60986	Short Circuit Temperature Limits Of Electric Cables With Rated Voltages From 6 kV ( $U_m = 7.2$ kV ) Up To 30 kV ( $U_m = 36$ kV )
IEC 61443	Short Circuit Temperature Limits Of Electric Cables With Rated Voltages Above 30 kV ( $U_m = 36$ kV )
IEC 62067	Power Cables With Extruded Insulation And Their Accessories For Rated Voltages above 150 kV ( $U_m = 170$ kV ) Up To 500 kV ( $U_m = 550$ kV ) - Test Methods And Requirements
MS 2104	Electric Cable And Wire : 600/1000 ( $U_m = 1200$ ) V Single Core XLPE Insulated Cable - Non-Armoured
MS 2105	Electric Cable And Wire : 600/1000 ( $U_m = 1200$ ) V Single Core XLPE Insulated Cable - Armoured
MS 2106	Electric Cable And Wire : 600/1000 ( $U_m = 1200$ ) V Multi Core XLPE Insulated Cable - Non-Armoured
MS 2107	Electric Cable And Wire : 600/1000 ( $U_m = 1200$ ) V Multi Core XLPE Insulated Cable - Armoured

The manufacturer reserves the right to modify or vary the construction or specification or any of the products at their discretion and without prior notice. The information contained herein is in line with the appropriate standards and sound electrical practice - it is believed to be reliable but as each applicant is unique, thus the manufacturer can accept no responsibility as to the suitability of any products for a particular use, or for any errors or omissions, unintentional or otherwise.

**Note:**





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