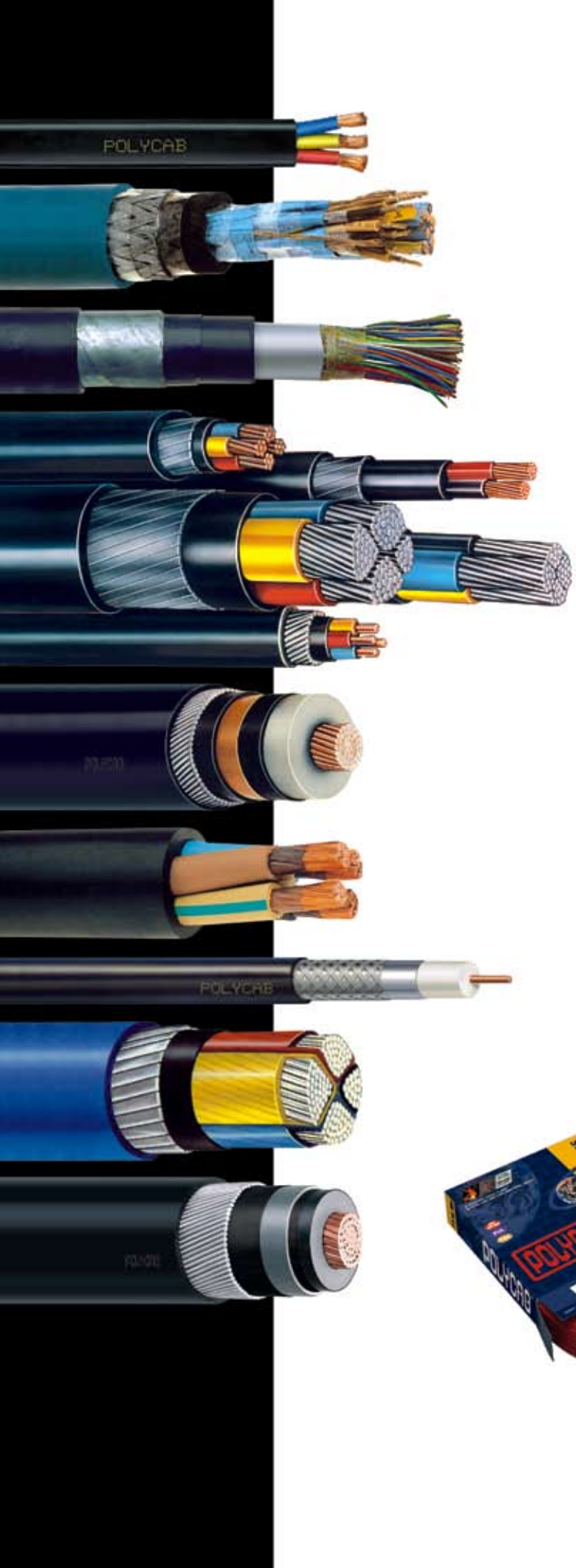
POLYCAB®

ISO 9001:2000

HIGH TENSION XLPE CABLES (UP TO 45 kV)



PRODUCT RANGE

- L.T. PVC & XLPE POWER CABLES WITH COPPER / ALUMINIUM CONDUCTOR (1100 V. UPTO 4 CORE X 630 SQ. MM., 1 CORE X 1000 SQ. MM.)
- L.T PVC & XLPE CONTROL CABLES (1100 V. UPTO 61 CORE X 1.5 & 2.5 SQ.MM.)
- H.T. XLPE CABLES UPTO 132 kV
- FIRE SURVIVAL, ZERO HALOGEN CABLES
- THERMO COUPLE COMPENSATING & EXTENSION CABLES
- INSTRUMENTATION CABLES SCREENED / UNSCREENED
- FRLS / FR / HR / HFFR / HOFR / RUBBER – POWER, CONTROL & INSTRUMENTATION CABLES
- HT / LT AERIAL BUNCHED CABLES
- RAILWAY SIGNALLING CABLES
- TELEPHONE CABLES – DRY & JELLY FILLED
- ACSR & AAAC CONDUCTORS
- MINING / WELDING – RUBBER CABLES
- EPR / SILICONE / HIGH TEMP. CABLES
- SUBMERSIBLE CABLES
- COAXIAL CABLES
- BUILDING WIRES & FLEXIBLES (SINGLE & MULTICORE)
- LAN CAT-5 / 5E, 6 CABLES
- PVC PIPES & ACCESSORIES
- INDUSTRIAL PLUGS & SOCKETS

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POLYCAB WIRES & CABLES
AN ISO 9001:2000 COMPANY

COMPANY PROFILE

POLYCAB WIRES & CABLES
AN ISO 9001:2000 COMPANY

POLYCAB, an ISO 9001: 2000 company is the largest Wire & Cable manufacturer in India with a proven track record of over three decades. The fastest growing company in the Indian Cable Industry with consistent growth of more then 40% per annum for the last 3 years. Polycab group has crossed Rs. 1500 crore turnover and is set to achieve Rs. 2000 crore turnover in the year 2006 – 07.

From a modest beginning with Wires and Cables, over three decades ago Polycab set up State of Art manufacturing facilities at Daman in 1996. In the manufacture of cables, a competitive edge lies not so much in product innovation as in consistent quality and ready availability. Polycab's Daman factory was created to address these key market determinants. The manufacturing set up is sourced out from the world renowned Machinery and Technology suppliers with constant upgradation and expansions.

In an on going process to improve Customer Satisfaction Polycab offers a variety of services:

- Commercially competitive prices.
- Reliable & consistent quality.
- Reliable & just in time delivery.
- Product development for a changing market.
- A targeted stocking policy.
- Technical Support for Applications/ Projects

POLYCAB derives its strength from its customers. The growth of the latter is a prerequisite to the growth of the company and hence customers' satisfaction is its prime objective. Over the years sincere service and dedication to its Customers has earned the Company distinguished Customers which includes leaders in Sectors like Utilities, Power Generation, Transmission & Distribution, Petroleum & Oil Refineries, Oem's, EPC contractors, Steel & Metal, Cement, Chemical, Atomic Energy, Nuclear Power, Consultants & Specifiers etc.

POLYCAB has highly experienced qualified and dedicated professionals with strong adherence to the quality management system. Polycab has offices all over the country and also has a wide network of authorized distributors and dealers to cater to all the customer segments in India and abroad.

POLYCAB has earned the trust and reputation in India and abroad by winning the customers' confidence. Several thousands kilometers of HV XLPE Cables in the voltage range of 6.6KV, 11KV, 22KV & 33KV have been manufactured and are in operation in India and abroad.

Polycab HV XLPE Cables are preferred choice in Power Plants, Distribution Systems, Heavy Industries, Various Utilities, The Titans of Indian Industry & Consultants / Specifiers.

MANUFACTURING PROCESS – AT POLYCAB

POLYCAB
WIRES & CABLES
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POLYCAB HV XLPE cables are manufactured at its most modern manufacturing setup in DAMAN. Manufacture of HV XLPE CABLES requires great care and skill at all stages of processing.Work on HV cables has shown to raise the electric stress of XLPE cables it is essential that the extruded insulation is of high cleanliness without any imperfection, free of contamination, voids and manufacturing defects, and that the screen interface is smooth. In addition an integrated extrusion plant employing a Continuous Centenary Vulcanizing (CCV) process line (Dry Curing Line) is required.Polycab easily met these two criteria by carefully selecting imported insulating materials and by installing 2 CCV lines sourced from world renowned manufacturers. (Fig 1)

Figure1 : 2 CCV (DRY CURE) LINES

The cable core is triple extruded and crosslinked in the fully enclosed process in which the inner semi-conducting screen, the XLPE insulation and the outer semi conducting screen are applied simultaneously (Fig 2) to the pre-heated cable conductor. Specialized in-line inspection techniques using X-rays are employed to monitor the dimensional accuracy of the extruded core. These examinations confirm the correct levels of dimensional accuracy.

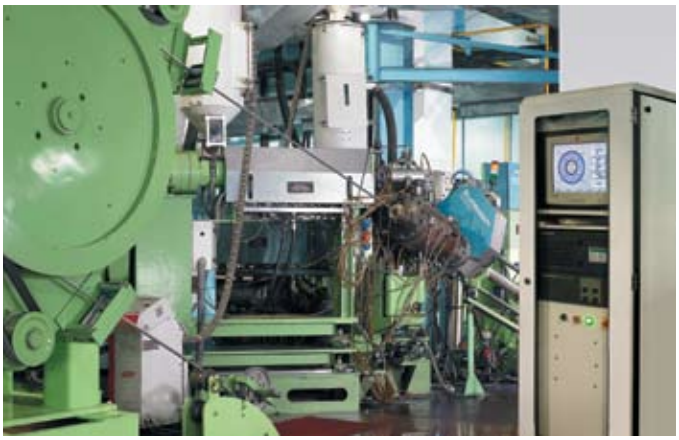

Figure 2 : THREE LAYER COMON TRIPLE EXTRUSION METHOD

The final stage of HV cable manufacture is the high voltage test, which comprises an HV withstand, and a partial discharge detection test. These tests take place in Polycab's sophisticated HV Test Lab (Fig 3). The tests are of short duration, typically 30 minutes, and are capable of detecting the defects that initiate partial discharges, as small as one pico-coulomb. Such defects lead to gradual deterioration of the XLPE and eventually breakdown may occur.

Figure3 : ULTRA MODERN HV TESTING LAB

FLOW CHART

POLYCAB WIRES & CABLES
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Conductor

Quality Checks

No. of Wires, Size, Conductor Resistance, Surface Finish, Diameter of Conductor

Continuous Triple Extrusion
Inner Semicon, XLPE Insulation Outer Semicon

Quality Checks

Type of Compounds, Batch No. details, Thickness, Core Dia, Eccentricity, Surface Finish, Hot Set Test

Copper Taping

Quality Checks

Size & Type of Tape, Market /Lot No., Overlap, Dia over tape, Continuity, Tape Jointing, Core Identification

Laying –Up / Twisting

Quality Checks

Core Sequence, No of Cores, Laylength., Binder /Roundness

Inner Sheathing (Extrusion*)

Quality Checks

Type of PVC, Batch/Lot No., Thickness of Sheath, Dia over Sheath

Armouring

Quality Checks

Armour Dimensions, No. of Armour, Coverage, Armour Joint

Outer Sheathing

Quality Checks

Type of PVC, Batch/Lot No., Thickness of Sheath, Dia over Sheath, Color, Surface Finish

Final Testing

Quality Checks

Conductor Resistance, High Voltage Test, Partial Discharge Test

Packing / Marking

Quality Checks

Marking Details, Lagging Coverage

Storage / Dispatch

* Lead Sheath (optional)

Cables with FRLS / Zero Halogen Outer Sheath can be supplied against specific requirement.

CONSTRUCTION OF HT CABLES

POLYCAB WIRES & CABLES
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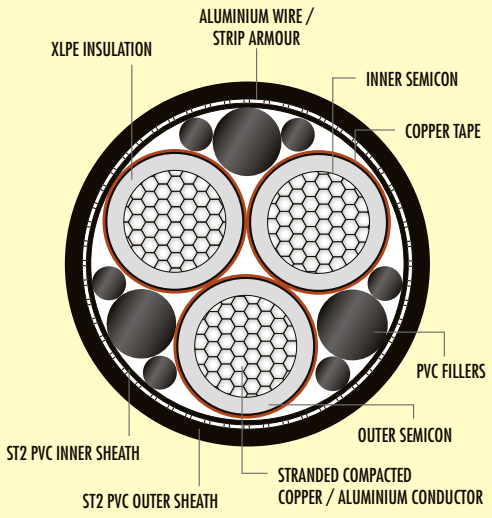
1.	**Conductor**	:	Stranded Class 2 - Annealed Plain / Tinned Copper / Aluminium - IS:8130 / IEC 60228/ BS 6360.
2.	**Conductor Screen**	:	Extruded semi-conducting compound – IS:7098 Part 2, IEC:60502 Part – 2, BS:6622, BS:7835.
3.	**Insulation**	:	XLPE – IS : 7098 Part 2, IEC:60502 Part – 2, BS:6622, BS:7835.
4.	**Insulation Non-metallic Screen**	:	Extruded semi-conducting compound – IS:7098 Part 2, IEC:60502 Part – 2, BS:6622, BS:7835.
5.	**Insulation Metallic Screen**	:	Copper Wire / Tape or Aluminium Wire / Strip – IS:7098 Part 2, IEC:60502 Part – 2, BS:6622, BS:7835.
6.	**Fillers**	:	Non Hygroscopic PVC * / Polypropelene Fiber to maintain roundness of cable.
7.	**Inner sheath/Bedding**	:	PVC ST 2 as per IS:7098 Part 2, IEC:60502 Part – 2, BS:6622, LSOH to BS:7835.
8.	**Armour**	:	IS:7098 Part 2, IS: 3975, IEC:60502 Part – 2, BS:6622, BS:7835.
9.	**Outer Sheath**	:	PVC ST 2, FR, FRLS as per IS:7098 Part 2, IEC:60502 Part – 2, BS:6622, LSOH to BS:7835.

Flame Retardant (FR), Flame Retardant Low Smoke (FRLS) and Low Smoke Zero Halogen & Flame Retardant (LSOH) Sheathed HT XLPE cables are also manufactured.

** Weights given in the Tables are with PVC Fillers.*

Polycab manufactures following voltage grade cables as per IS-7098[Part-2], IEC-60502 Part-2 and BS-6622 & BS:7835



- 45 kV or 33 kV (UE) Screened XLPE Cables as per customer requirement.
- 19/33 kV Screened Cable i.e. 33 kV (E)
- 12.7/22 kV Screened Cables i.e. 22 kV (E)
- 11/11 kV Screened Cables. i.e. 11 kV (UE)
- 6.35/11 kV, Screened Cables i.e. 6.6 kV (UE)
- 3.8/6.6 kV Screened Cables.
- 3.3kV (E) and (UE) Unscreened & Screened Cables.

SIZES:

- 50 Sq.mm up to 1000 Sq.mm in Single Core Cables.
- 35 Sq.mm to 400 Sq.mm in Multi Cores Cables.

QUALITY ASSURANCE

POLYCAB WIRES & CABLES
AN ISO 9001:2000 COMPANY

Polycabs goal is to have satisfied customers. Quality assurance consisting of rigorous inspection followed by meticulous process and quality control in all phases, guarantees the superior quality of POLYCABS products. Up-to-Date laboratory facilities ensure that quality control requirements are met in full. Polycab XLPE Cables are tested to ensure high reliability in performance. Continuous process monitoring and post manufacturing tests ensure the compliance to Indian and International Standards. The assurance of quality is further ensured by ISI certification No. CM/L-7180366 on cables and ISO 9001 certification by $U_{L,}$ USA, A-7913.

QUALITY ASSURANCE TESTING :

Polycab is self sufficient to carry out all Routine & Type Tests in its own laboratory. It has world class Testing facilities for Routine & Type Tests. **Routine Tests : IS:7098 Part 2, IEC:60502, BS:6622, BS:7835**

- Partial Discharge Test
- High Voltage Test
- Conductor Resistance Test. Routine Tests are performed on each manufactured length of cable in Routine Test Laboratory.

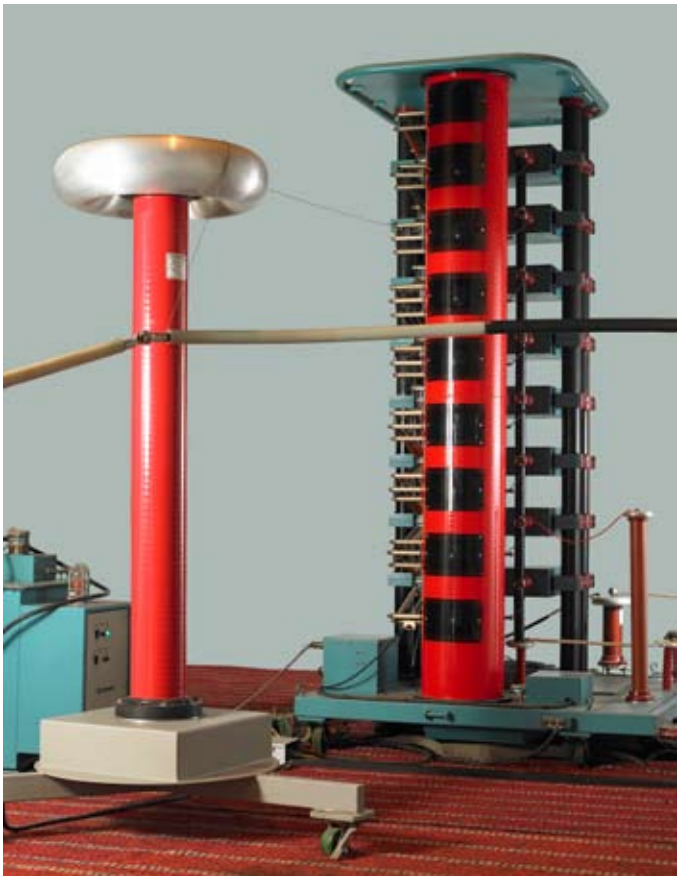
TYPE TESTS:

IS:7098 Part 2, IEC:60502, BS:6622, BS:7835

a) Electrical Type Tests
b) Non-Electrical Type Tests
c) Special Tests.

The cable samples are type tested in-house to ensure conformance as to various standards.

Polycab cables of various voltage grades are type tested at CPRI Bangalore & ERDA Vadodara. Short circuit tests on cable conductor and armour are successfully carried at CPRI Bhopal & ERDA Vadodara.



IMPULSE TEST SET UP

NON ELECTRICAL TYPE TEST LABORATORY

FLAME RETARDANT LOW SMOKE CABLES

The behaviour of Electric Cables in presence of fire has been a matter of great concern to all Electrical Engineers involved in Generation, Transmission and Utilisation of electric power. Normally all XLPE Cables have an outer sheath of PVC. Although PVC by itself is flame retarding, it does produce highly toxic and corrosive fumes in the event of fire.

As a matter of fact, in closed and crowded places such as power stations, subways, railways with long sections in tunnels, road tunnels, ships, hospitals, schools, hotels, cinema theatres, museums and public premises in general, besides the obvious danger represented by fire propagation, also fume toxicity and opacity are particularly important as they may cause, with equally serious consequences for human safety, suffocation intoxication and panic due to reduced visibility.

FRLS PVC compound should ensure the following :

1) Minimum smoke emission.

2) Very low toxic and corrosive fumes emission.

3) Fire Retardant characteristics.

Our laboratory is well equipped with latest test equipments to carry out following test requirements.

a) The oxygen index and temperature index of sheath as per ASTM-D 2863.

b) Flammability characteristics of cable as per IEC-332 (Pt. I) & IEC-332 (Pt. III)

c) Flammability characteristics of cables as per Swedish Standard SS 424 14 75, Class F3.

d) Determination of the amount of halogen acid gas evolved during combustion of outersheath materials as per per IEC 754 (Pt. I).

e) Determination of smoke generation of outersheath material under fire as per ASTM-D 2843

f) The measurement of smoke density as per IEC 61034.

ADVANTAGES OF POLYCAB XLPE CABLES

POLYCAB WIRES & CABLES
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- **Higher Electrical Strength Retention**
- **Higher Short Circuit Rating**
- **Better Electrical , Mechanical & Thermal Properties**
- **Easy Jointing & Termination**

SELECTION OF CABLES

Power Cables are generally selected considering the application. However, following factors are important for selection of suitable cable construction required to transport electrical energy from one end to the other.

1) Maximum operating voltage,
2) Fault Level,
3) Load to be carried,
4) Possible overloading duration & magnitude,
5) Route length and voltage drop.
6) Mode of installation considering installation environment such as ambient & ground temperature chemical & physical properties of soil.
7) Flame retardant properties.

All sizes of POLYCAB XLPE cables are designed to standard operating conditions in India and abroad. The standards adopted are considering the geographical/climatical conditions and general applications of power for utilities, distribution and generation purposes.

The cables are manufactured conforming to Indian & International cables specifications for XLPE Insulated cables. Customer specific requirements can also be met.

POLYCAB GUIDELINES FOR SELECTION OF CABLES

POLYCAB WIRES & CABLES
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Polycab is manufacturing wide range of cables, so it is important that while placing enquiries or orders, as much information as possible shall be given to Polycab, so that the enquiries and orders are dealt quickly and efficiently.

1) **Voltage Grade** : 1.9/3.3kV(E),3.3/3.3kV(UE),3.8/6.6kV(E),6.6/6.6kV(UE),6.35/11kV(E), 11 / 11 kV (UE), 12.7 / 22 kV (E) & 33 kV (E), 33 kV (UE) & 45 kV

2) **Relevant Indian Standard** : IS 7098 (Part-2) – 1985 or International standard – IEC-60502 (Part-2), BS-6622 & BS:7835.

3) **Number of cores.** : Single & Three.

4) **Conductor** : Size - 35 Sq.mm to 1000 Sq.mm in Single Core Cables & 35 Sq.mm to 400 Sq.mm in 3Core cables.

5) **Conductor Material** : Copper / Aluminium

6) **Type of Insulation** : XLPE

7) **Type of Inner Sheathing** : PVC Wrapped / PVC Extruded.

8) **Type of Armour** : Unarmoured / Strip Armoured / Round Wire Armoured.

9) **Type of Outer Sheath** : PVC / Flame Retardant / Flame Retardant Low Smoke / Zero Halogen (LSOH).

10) **Length of cable required and drum length.**

CONDUCTOR RESISTANCE

The details to the above Guidelines are given in tables.

Table - 1 *Conductor Technical Information for Single Core and Multicore cables conforming to IS-8130 /1984 (Stranded –Class-2) Copper & Aluminium Conductors.

Nominal Size of Conductor	Minimum no. of wires		Max. D.C. Resistance at 20°C		A.C. Resistance at 90°C	
	Compacted Round		Plain Copper	Aluminium	Plain Copper	Aluminium
Sq.mm	CU.	ALU.	Ohm/Km	Ohm/Km	Ohm/Km	Ohm/Km
25	6	6	0.727	1.20	0.930	1.54
35	6	6	0.524	0.868	0.671	1.11
50	6	6	0.387	0.641	0.495	0.82
70	12	12	0.268	0.443	0.343	0.567
95	15	15	0.193	0.320	0.247	0.410
120	18	15	0.153	0.253	0.196	0.324
150	18	15	0.124	0.206	0.159	0.264
185	30	30	0.0991	0.164	0.127	0.210
240	34	30	0.0754	0.125	0.0965	0.160
300	34	30	0.0601	0.100	0.0769	0.130
400	53	53	0.0470	0.0778	0.0602	0.10
500	53	53	0.0366	0.0605	0.0468	0.0774
630	53	53	0.0283	0.0469	0.0362	0.060
800	53	53	0.0221	0.0367	0.0283	0.0470
1000	53	53	0.0176	0.0291	0.0225	0.0372

* Conductor meeting requirements of IEC-60228 and BS 6360 can also be manufactured.

Table - 2 SHORT CIRCUIT RATING FOR 1 SECOND DURATION FOR COPPER AND ALUMINIUM XLPE CABLES (CURRENT IN K. AMPS)

Nominal Size	XLPE Insulated	
Sq.mm	Copper	Aluminium
25	3.6	2.4
35	5.0	3.3
50	7.1	4.7
70	10.0	6.6
95	13.6	9.0
120	17.1	11.3
150	21.4	14.2
185	26.4	17.5
240	34.3	22.6
300	42.9	28.3
400	57.1	37.7
500	71.4	47.2
630	90.0	59.4
800	114.3	75.5
1000	142.9	94.3

XLPE Cables as per IS-7098 (Part-2)-1985

1) Max. Conductor Temperature during operation: 90°C
2) Max. Conductor Temperature during short Circuit: 250° C

Formula relating Short Circuit Rating with duration

$$It = \frac{I\,sh}{\sqrt{t}}$$

Where

It = Short Circuit Rating for t Seconds.

t = duration in seconds

I sh = Short Circuit rating for 1 second.

Table - 3 CAPACITANCE

Approximate Capacitance (Microfarads/km) for Single Core Cables

Size	Voltage Grade(kV)						
	1.9/3.3 & 3.3/3.3	3.8/6.6	6.6/6.6 & 6.35/11	11/11	12.7/22	19/33	33/33
35							
50	0.30	0.27	0.23				
70	0.34	0.31	0.27	0.18			
95	0.39	0.34	0.31	0.20	0.19	0.15	0.14
120	0.43	0.37	0.33	0.22	0.20	0.16	0.15
150	0.49	0.42	0.36	0.24	0.22	0.17	0.16
185	0.52	0.44	0.39	0.25	0.24	0.18	0.17
240	0.59	0.50	0.43	0.28	0.26	0.20	0.19
300	0.67	0.53	0.48	0.32	0.30	0.23	0.20
400	0.76	0.55	0.53	0.36	0.33	0.25	0.23
500	0.77	0.57	0.50	0.39	0.36	0.27	0.25
630	0.81	0.64	0.69	0.43	0.40	0.29	0.28
800	0.86	0.73	0.79	0.49	0.45	0.33	0.30
1000	0.88	0.80	0.88	0.53	0.49	0.35	0.33

Table - 4 CAPACITANCE

Approximate Capacitance (Microfarads/km) For Three Core Cables

Size	Voltage Grade(kV)						
	1.9/3.3& 3.3/3.3	3.8/6.6	6.6/6.6 & 6.35/11	11/11	12.7/22	19/33	33/33
35	0.24	0.25	0.21				
50	0.27	0.27	0.22				
70	0.31	0.31	0.25	0.19			
95	0.35	0.35	0.29	0.21	0.20	0.15	0.14
120	0.39	0.38	0.31	0.23	0.22	0.16	0.15
150	0.42	0.43	0.34	0.25	0.23	0.18	0.16
185	0.46	0.45	0.36	0.27	0.25	0.18	0.17
240	0.51	0.51	0.41	0.30	0.28	0.20	0.19
300	0.57	0.54	0.46	0.33	0.31	0.23	0.20
400	0.63	0.57	0.52	0.37	0.34	0.25	0.23

POLYCAB WIRES & CABLES
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Table - 5 REACTANCE

Approximate Reactance At 50 Hz(Ohms/km) For Single Core Cables

Size	Voltage Grade(kV)													
	1.9/3.3& 3.3/3.3		3.8/6.6		6.6/6.6 & 6.35/11		11/11		12.7/22		19/33		33/33	
	Arm	Un-Arm	Arm	Un-Arm	Arm	Un-Arm	Arm	Un-Arm	Arm	Un-Arm	Arm	Un-Arm	Arm	Un-Arm
35														
50	0.115	0.104	0.119	0.110	0.133	0.127	0.133	0.125	0.137	0.130	0.147	0.140		
70	0.109	0.098	0.113	0.105	0.123	0.118	0.126	0.119	0.130	0.123	0.141	0.133		
95	0.104	0.095	0.108	0.100	0.116	0.111	0.120	0.114	0.124	0.116	0.135	0.127	0.143	0.137
120	0.100	0.092	0.104	0.101	0.112	0.107	0.117	0.110	0.119	0.112	0.130	0.122	0.137	0.131
150	0.096	0.088	0.101	0.093	0.109	0.104	0.112	0.106	0.115	0.107	0.126	0.118	0.134	0.129
185	0.094	0.087	0.099	0.091	0.107	0.101	0.110	0.103	0.114	0.105	0.124	0.115	0.128	0.122
240	0.091	0.084	0.096	0.089	0.104	0.097	0.106	0.100	0.110	0.101	0.118	0.110	0.124	0.118
300	0.088	0.081	0.093	0.086	0.100	0.094	0.102	0.096	0.105	0.097	0.112	0.105	0.120	0.114
400	0.086	0.079	0.091	0.085	0.096	0.091	0.098	0.092	0.101	0.093	0.119	0.102	0.115	0.109
500	0.085	0.078	0.088	0.083	0.093	0.089	0.095	0.090	8.099	0.091	0.105	0.099	0.111	0.106
630	0.083	0.077	0.087	0.081	0.092	0.086	0.094	0.087	0.095	0.089	0.101	0.096	0.108	0.103
800	0.082	0.076	0.085	0.077	0.089	0.084	0.091	0.085	0.092	0.086	0.097	0.092	0.106	0.099
1000	0.081	0.075	0.084	0.076	0.087	0.082	0.088	0.083	0.090	0.085	0.096	0.090	0.102	0.096

Table - 6 REACTANCE

Approximate Reactance At 50 Hz (Ohms/km) For Three Core Cables

Size	Voltage Grade(kV)						
	1.9/3.3& 3.3/3.3	3.8/6.6	6.6/6.6 & 6.35/11	11/11	12.7/22	19/33	33/33
35	0.094	0.104	0.111				
50	0.087	0.098	0.104				
70	0.084	0.094	0.100	0.129			
95	0.081	0.090	0.095	0.123	0.125	0.121	0.131
120	0.078	0.087	0.092	0.117	0.120	0.116	0.125
150	0.076	0.085	0.089	0.114	0.116	0.112	0.122
185	0.075	0.083	0.087	0.110	0.113	0.110	0.116
240	0.073	0.081	0.085	0.106	0.108	0.105	0.112
300	0.072	0.079	0.082	0.103	0.105	0.100	0.108
400	0.071	0.078	0.079	0.099	0.101	0.097	0.103

Note: All figures given in various tables are indicative only.

POLYCAB RECOMMENDATIONS FOR CURRENT RATINGS:

The current rating of power cable is defined by the maximum intensity of current (amperes) which can flow continuously through the cable, under permanent loading conditions, without any risk of damaging the cable or deterioration of its electrical properties.

The value given in the tables are valid for one circuit in a three phase system under conditions specified. For grouping cables rating factors must be used.

The current carrying capacities mentioned in POLYCAB technical data are intended as a guide, to assist operating engineers in selecting cables for safety and reliability.

Basic assumptions and conditions of installation :

1) Maximum Conductor Temperature : 90° C
2) Ambient Ground Temperature : 30° C
3) Ambient Air Temperature : 40° C
4) Thermal resistivity of soil : 150° C. Cm/W

Depth of laying (to the highest point of the cables laid direct in the ground)

1) 3.3, 6.6 & 11kV Cables : 90 cm
2) 22 and 33kV Cables : 105 cm

*Max. Conductor temperature at the end of a short circuit : 250° C

To obtain the maximum current carrying capacity of a cable operating at different conditions from the standard, various rating factors are to be multiplied, as follows :

$I_a = K \times I_s$ in amperes Where ;

I_a : Current rating at actual operating conditions (amperes)

I_s : Current rating at standard operating conditions (amperes)

K : Rating factor as, applicable.

A). FOR AIR AND GROUND TEMPERATURE.

A. Rating factors for variation in ambient air temperature.							
Ambient Temp (°C)	25	30	35	40	45	50	
Rating Factors	1.14	1.10	1.04	1.00	0.95	0.90	
B. Rating factors for variation in ground temperature.							
Ground Temp (°C)	15	20	25	30	35	40	45
Rating Factors	1.12	1.08	1.03	1.00	0.96	0.91	0.87

B). FOR DEPTH OF LAYING (CABLES LAID DIRECT IN THE GROUND)

Depth of laying (cm)	3.3kV, 6.6kV & 11kV all sizes	22kV & 33 kV all Size
90	1	—
105	0.99	1
120	0.98	0.99
150	0.96	0.97
180 or more	0.95	0.96

C). FOR VARIATION IN THERMAL RESISTIVITY OF SOIL

Thermal Resistivity of Soil (°Ccm/w)	100	120	150	200	250	300
Factor	1.20	1.11	1.0	0.89	0.80	0.73

GROUP RATING FACTORS FOR SINGLE-CORE CABLES

A). Cables laid direct in the ground in horizontal formation.

Number of trefoils in group	Spacing between trefoils 3.3 to 22kV cables				33 kV Cables.			
	Touching	15 cm	30 cm	45 cm	Touching	15 cm	30 cm	45 cm
2	0.78	0.81	0.85	0.88	0.80	0.82	0.85	0.88
3	0.68	0.71	0.77	0.81	0.68	0.71	0.76	0.79
4	0.61	0.65	0.72	0.76	0.62	0.65	0.71	0.75
5	0.56	0.61	0.68	0.73	0.57	0.60	0.67	0.72

B). Cables laid on Racks / Trays in covered trench with removable covers where air circulation is restricted, Trefoils are separated by two cable diameter horizontally and the trays are in tiers having 300 mm distance.

No. racks/trays in tiers	No. of Trefoils in Horizontal formation		
	1	2	3
1	0.95	0.90	0.88
2	0.90	0.85	0.83
3	0.88	0.83	0.81
6	0.86	0.81	0.79

C). As above B. but c ables laid in open air.

No. racks/trays in tiers	No. of Trefoils in Horizontal formation		
	1	2	3
1	1	0.98	0.96
2	1	0.95	0.93
3	1	0.94	0.92
6	1	0.93	0.90

FOR MULTI-CORE CABLES:

A) Cables laid inside concrete trench with removable covers, on cable trays where air circulation is restricted.The cables spaced by one cable diameter and trays are in tiers spaced by 300 mm.The clearance between the wall and the cable is 25 mm.

No. of cables trays in tier	No. of cables				
	1	2	3	6	9
1	0.95	0.90	0.88	0.85	0.84
2	0.90	0.85	0.83	0.81	0.80
3	0.88	0.83	0.81	0.79	0.78
6	0.86	0.81	0.79	0.77	0.76

B) Cable laid on cable trays exposed to air , the cables spaced by one cable diameter and trays are in tiers spaced by 300 mm.The clearance of the cable from the wall is 25 mm.

No. of cables trays in tier	No. of cables				
	1	2	3	6	9
1	1	0.98	0.96	0.93	0.92
2	1	0.95	0.93	0.90	0.89
3	1	0.94	0.92	0.89	0.88
6	1	0.93	0.90	0.87	0.86

C) Cables laid on cable trays exposed to air, the cables touching and trays are in tiers spaced by 300 mm. The clearance between the wall and the cable is 25 mm.

No. of cables trays.	No. of cables per tray				
	1	2	3	6	9
1	1	0.84	0.80	0.75	0.73
2	1	0.80	0.76	0.71	0.69
3	1	0.78	0.74	0.70	0.68
6	1	0.76	0.72	0.68	0.66

D) Cables laid direct in ground in horizontal formation

No. of cables in group	Distance of cables			
	Touching	15 mm	30 mm	45 mm
2	0.79	0.82	0.87	0.90
3	0.69	0.75	0.79	0.83
4	0.62	0.69	0.74	0.79
5	0.58	0.65	0.72	0.76
6	0.54	0.61	0.69	0.75

TABLE 7-3.8 / 6.6 KV (E) HT XLPE SINGLE CORE ALUMINIUM CONDUCTOR CABLES

"POLYCAB" SINGLE CORE ALUMINIUM CONDUCTOR, XLPE INSULATED, UNARMOURED & ARMOURED CABLES CONFORMING TO IS: 7098 PART-2/1985:

Nominal Size of Conductor	Nominal Thickness of XLPE Insulation	UNARMOURED CABLE			Minimum Thickness of Inner Sheath	ALUMINIUM STRIP ARMOURED CABLE				ALUMINIUM ROUND WIRE ARMOURED CABLE				CURRENT CARRYING CAPACITY			*Normal Delivery Length.
		Nominal Thickness of PVC Outer Sheath	Approx. Overall Diaeter of Cable.	Approx. Weight of Cable.		Nominal Dimesion of Strip	Minimum Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx. Weight of Cable.	Nominal Dimesion of Round Wire	Minimum Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx. Weight of Cable.	In Ground at 30° C.	In Duct at 30° C.	In Air at 40° C.	
Sq.mm.	mm	mm	mm	Kg/Km	mm	mm	mm	mm	Kg/Km	mm	mm	mm	Kg/Km	Amps.	Amps.	Amps.	Mtrs.
35	2.8	2.0	20.0	450	0.30	0.8	1.4	21.0	550	1.6	1.40	22.5	620	120	105	145	500
50	2.8	2.0	21.0	500	0.30	0.8	1.4	22.0	600	1.6	1.40	23.5	700	140	125	170	500
70	2.8	2.0	23.0	600	0.30	0.8	1.4	24.0	750	1.6	1.40	25.5	800	175	155	215	500
95	2.8	2.0	24.5	750	0.30	0.8	1.4	25.5	850	1.6	1.40	27.0	950	205	180	260	500
120	2.8	2.0	26.0	850	0.30	0.8	1.4	27.0	950	1.6	1.40	29.0	1050	235	205	305	500
150	2.8	2.0	27.0	950	0.30	0.8	1.4	28.5	1100	1.6	1.56	30.5	1200	260	230	345	500
185	2.8	2.0	29.0	1100	0.30	0.8	1.56	31.0	1250	1.6	1.56	32.5	1400	295	260	395	500
240	2.8	2.2	32.0	1350	0.40	0.8	1.56	33.0	1500	2.0	1.56	35.5	1700	340	300	470	500
300	3.0	2.2	34.5	1550	0.40	0.8	1.56	36.0	1750	2.0	1.56	38.0	2000	385	335	540	500
400	3.3	2.2	38.5	1950	0.40	0.8	1.56	40.0	2200	2.0	1.72	42.5	2450	440	380	630	500
500	3.5	2.4	42.0	2400	0.50	0.8	1.72	43.5	2650	2.0	1.88	46.5	2950	495	430	730	500
630	3.5	2.4	45.5	2850	0.50	0.8	1.88	47.5	3200	2.0	1.88	50.0	3450	560	480	840	500
800	3.5	2.6	50.0	3450	0.50	0.8	1.88	51.0	3750	2.5	2.04	55.0	4300	620	530	960	500
1000	3.6	2.8	55.0	4250	0.60	0.8	2.04	56.5	4600	2.5	2.20	60.5	5150	680	580	1070	500

TABLE 8 - 3.8 / 6.6 KV (E) HT XLPE SINGLE CORE COPPER CONDUCTOR CABLES

"POLYCAB" SINGLE CORE COPPER CONDUCTOR, XLPE INSULATED, UNARMOURED & ARMOURED CABLES CONFORMING TO IS: 7098 PART-2/1985:

Nominal Size of Conductor	Nominal Thickness of XLPE Insulation	UNARMOURED CABLE			Minimum Thickness of Inner Sheath	ALUMINIUM STRIP ARMOURED CABLE				ALUMINIUM ROUND WIRE ARMOURED CABLE				CURRENT CARRYING CAPACITY			*Normal Delivery Length.
		Nominal Thickness of PVC Outer Sheath	Approx. Overall Diaeter of Cable.	Approx. Weight of Cable.		Nominal Dimesion of Strip	Minimum Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx. Weight of Cable.	Nominal Dimesion of Round Wire	Minimum Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx. Weight of Cable.	In Ground at 30° C.	In Duct at 30° C.	In Air at 40° C.	
Sq.mm.	mm	mm	mm	Kg/Km	mm	mm	mm	mm	Kg/Km	mm	mm	mm	Kg/Km	Amps.	Amps.	Amps.	Mtrs.
35	2.8	2.0	20.0	670	0.30	0.8	1.4	21.0	750	1.6	1.40	22.5	850	155	140	185	500
50	2.8	2.0	21.0	850	0.30	0.8	1.4	22.0	900	1.6	1.40	23.5	1000	185	160	220	500
70	2.8	2.0	23.0	1050	0.30	0.8	1.4	24.0	1150	1.6	1.40	25.5	1250	225	195	275	500
95	2.8	2.0	24.5	1300	0.30	0.8	1.4	25.5	1450	1.6	1.40	27.0	1550	265	235	340	500
120	2.8	2.0	26.0	1600	0.30	0.8	1.4	27.0	1700	1.6	1.40	29.0	1800	300	265	390	500
150	2.8	2.0	27.0	1900	0.30	0.8	1.4	28.5	2050	1.6	1.56	30.5	2150	335	295	440	500
185	2.8	2.0	29.0	2250	0.30	0.8	1.56	31.0	2400	1.6	1.56	32.5	2550	380	330	510	500
240	2.8	2.2	32.0	2850	0.40	0.8	1.56	33.0	3000	2.0	1.56	35.5	3200	435	380	600	500
300	3.0	2.2	34.5	3450	0.40	0.8	1.56	36.0	3600	2.0	1.56	38.0	3850	490	425	680	500
400	3.3	2.2	38.5	4450	0.40	0.8	1.56	40.0	4650	2.0	1.72	42.5	4950	550	480	790	500
500	3.5	2.4	42.0	5500	0.50	0.8	1.72	43.5	5750	2.0	1.88	46.5	6050	610	530	910	500
630	3.5	2.4	45.5	6750	0.50	0.8	1.88	47.5	7100	2.0	1.88	50.0	7350	680	580	1030	500
800	3.5	2.6	50.0	8450	0.50	0.8	1.88	51.0	8700	2.5	2.04	55.0	9250	740	630	1140	500
1000	3.6	2.8	55.0	10450	0.60	0.8	2.04	56.5	10800	2.5	2.20	60.5	11350	790	670	1250	500

The above data is approximate and subject to manufacturing tolerance.

* Delivery Length tolerance is ± 5 %. Length more than normal as per customer request.

TABLE 9 - 6.35/11 KV (E), 6.6/6.6 KV (UE) HT XLPE SINGLE CORE ALUMINIUM CONDUCTOR CABLES

"POLYCAB" SINGLE CORE ALUMINIUM CONDUCTOR, XLPE INSULATED, UNARMOURED & ARMOURED CABLES CONFORMING TO IS: 7098 PART-2/1985:

Nominal Size of Conductor	Nominal Thickness of XLPE Insulation	UNARMOURED CABLE			Minimum Thickness of Inner Sheath	ALUMINIUM STRIP ARMOURED CABLE				ALUMINIUM ROUND WIRE ARMOURED CABLE				CURRENT CARRYING CAPACITY			*Normal Delivery Length.
		Nominal Thickness of PVC Outer Sheath	Approx. Overall Diaeter of Cable.	Approx. Weight of Cable.		Nominal Dimesion of Strip	Minimum Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx. Weight of Cable.	Nominal Dimesion of Round Wire	Minimum Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx. Weight of Cable.	In Ground at 30° C.	In Duct at 30° C.	In Air at 40° C.	
Sq.mm.	mm	mm	mm	Kg/Km	mm	mm	mm	mm	Kg/Km	mm	mm	mm	Kg/Km	Amps.	Amps.	Amps.	Mtrs.
35	3.6	2.0	21.5	550	0.30	0.8	1.4	23.0	650	1.6	1.40	24.5	750	120	105	145	500
50	3.6	2.0	23.0	600	0.30	0.8	1.4	24.0	700	1.6	1.40	25.5	800	140	125	170	500
70	3.6	2.0	24.5	700	0.30	0.8	1.4	25.5	800	1.6	1.40	27.5	950	175	155	215	500
95	3.6	2.0	26.0	800	0.30	0.8	1.4	27.5	950	1.6	1.40	29.0	1050	205	180	260	500
120	3.6	2.0	28.0	950	0.30	0.8	1.4	29.0	1050	1.6	1.56	31.0	1200	235	205	305	500
150	3.6	2.0	29.0	1050	0.30	0.8	1.56	30.5	1200	1.6	1.56	32.5	1350	260	230	345	500
185	3.6	2.2	31.5	1250	0.40	0.8	1.56	33.0	1400	2.0	1.56	35.5	1600	295	260	395	500
240	3.6	2.2	35.0	1450	0.40	0.8	1.56	35.0	1600	2.0	1.56	38.0	1850	340	300	470	500
300	3.6	2.2	36.0	1650	0.40	0.8	1.56	37.0	1850	2.0	1.56	40.0	2100	385	335	540	500
400	3.6	2.2	39.0	2000	0.40	0.8	1.72	40.5	2250	2.0	1.72	43.5	2550	440	380	630	500
500	3.6	2.4	42.5	2450	0.50	0.8	1.72	44.0	2650	2.0	1.88	46.5	3000	495	430	730	500
630	3.6	2.4	46.0	2900	0.50	0.8	1.88	47.5	3200	2.0	1.88	50.0	3450	560	480	840	500
800	3.6	2.6	50.0	3500	0.50	0.8	1.88	51.5	3800	2.5	2.04	55.0	4300	620	530	960	500
1000	3.6	2.8	55.0	4250	0.60	0.8	2.04	56.5	4600	2.5	2.20	60.5	5150	680	580	1070	500

TABLE 10 - 6.35/11 KV (E), 6.6/6.6 KV (UE) HT XLPE SINGLE CORE COPPER CONDUCTOR CABLES

"POLYCAB" SINGLE CORE COPPER CONDUCTOR, XLPE INSULATED, UNARMOURED & ARMOURED CABLES CONFORMING TO IS: 7098 PART-2/1985:

Nominal Size of Conductor	Nominal Thickness of XLPE Insulation	UNARMOURED CABLE			Minimum Thickness of Inner Sheath	ALUMINIUM STRIP ARMOURED CABLE				ALUMINIUM ROUND WIRE ARMOURED CABLE				CURRENT CARRYING CAPACITY			*Normal Delivery Length.
		Nominal Thickness of PVC Outer Sheath	Approx. Overall Diaeter of Cable.	Approx. Weight of Cable.		Nominal Dimesion of Strip	Minimum Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx. Weight of Cable.	Nominal Dimesion of Round Wire	Minimum Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx. Weight of Cable.	In Ground at 30° C.	In Duct at 30° C.	In Air at 40° C.	
Sq.mm.	mm	mm	mm	Kg/Km	mm	mm	mm	mm	Kg/Km	mm	mm	mm	Kg/Km	Amps.	Amps.	Amps.	Mtrs.
35	3.6	2.0	21.5	750	0.30	0.8	1.4	23.0	850	1.6	1.40	24.5	950	155	140	185	500
50	3.6	2.0	23.0	900	0.30	0.8	1.4	24.0	1000	1.6	1.40	25.5	1110	185	160	220	500
70	3.6	2.0	24.5	1150	0.30	0.8	1.4	25.5	1250	1.6	1.40	27.5	1350	225	195	275	500
95	3.6	2.0	26.0	1400	0.30	0.8	1.4	27.5	1550	1.6	1.40	29.0	1650	265	235	340	500
120	3.6	2.0	28.0	1650	0.30	0.8	1.4	29.0	1800	1.6	1.56	31.0	1950	300	265	390	500
150	3.6	2.0	29.0	1950	0.30	0.8	1.56	30.5	2150	1.6	1.56	32.5	2250	335	295	440	500
185	3.6	2.2	31.5	2400	0.40	0.8	1.56	33.0	2550	2.0	1.56	35.5	2750	380	330	510	500
240	3.6	2.2	33.5	2900	0.40	0.8	1.56	35.0	3100	2.0	1.56	38.0	3350	435	380	600	500
300	3.6	2.2	36.0	3500	0.40	0.8	1.56	37.0	3700	2.0	1.56	40.0	3950	490	425	680	500
400	3.6	2.2	39.0	4500	0.40	0.8	1.72	40.5	4750	2.0	1.72	43.5	5050	550	480	790	500
500	3.6	2.4	42.5	5500	0.50	0.8	1.72	44.0	5800	2.0	1.88	46.5	6100	610	530	910	250
630	3.6	2.4	46.0	6800	0.50	0.8	1.88	47.5	7100	2.0	1.88	50.0	7350	680	580	1030	250
800	3.6	2.6	50.0	8450	0.50	0.8	1.88	51.5	8750	2.5	2.04	55.0	9250	740	630	1140	250
1000	3.6	2.8	55.0	10450	0.60	0.8	2.04	56.5	10800	2.5	2.20	60.5	11350	790	670	1250	200

The above data is approximate and subject to manufacturing tolerance.
* Delivery Length tolerance is ± 5 %. Length more than normal as per customer request.

TABLE 11 - 11/ 11 KV (UE) HT XLPE SINGLE CORE ALUMINIUM CONDUCTOR CABLES

"POLYCAB" SINGLE CORE ALUMINIUM CONDUCTOR, XLPE INSULATED, UNARMOURED & ARMOURED CABLES CONFORMING TO IS: 7098 PART-2/1985:

Nominal Size of Conductor	Nominal Thickness of XLPE Insulation	UNARMOURED CABLE			Minimum Thickness of Inner Sheath	ALUMINIUM STRIP ARMOURED CABLE				ALUMINIUM ROUND WIRE ARMOURED CABLE				CURRENT CARRYING CAPACITY			*Normal Delivery Length.
		Nominal Thickness of PVC Outer Sheath	Approx. Overall Diaeter of Cable.	Approx. Weight of Cable.		Nominal Dimesion of Strip	Minimum Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx. Weight of Cable.	Nominal Dimesion of Round Wire	Minimum Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx. Weight of Cable.	In Ground at 30° C.	In Duct at 30° C.	In Air at 40° C.	
Sq.mm.	mm	mm	mm	Kg/Km	mm	mm	mm	mm	Kg/Km	mm	mm	mm	Kg/Km	Amps.	Amps.	Amps.	Mtrs.
70	5.5	2.0	28.5	850	0.30	0.8	1.56	30.0	1050	1.6	1.56	31.5	1150	175	155	215	500
95	5.5	2.0	30.0	980	0.30	0.8	1.56	32.0	1200	2.0	1.56	34.0	1350	205	180	260	500
120	5.5	2.2	32.0	1150	0.40	0.8	1.56	33.5	1300	2.0	1.56	36.0	1500	235	205	305	500
150	5.5	2.2	33.5	1260	0.40	0.8	1.56	35.0	1450	2.0	1.56	37.0	1650	260	230	345	500
185	5.5	2.2	35.5	1430	0.40	0.8	1.56	37.0	1600	2.0	1.56	39.0	1850	295	260	395	500
240	5.5	2.2	37.5	1650	0.40	0.8	1.56	39.0	1850	2.0	1.72	42.0	2150	340	300	470	500
300	5.5	2.2	39.5	1900	0.40	0.8	1.72	41.5	2150	2.0	1.72	44.0	2400	385	335	540	500
400	5.5	2.4	43.0	2300	0.50	0.8	1.72	45.0	2600	2.0	1.88	47.5	2900	440	380	630	500
500	5.5	2.4	46.0	2700	0.50	0.8	1.88	48.0	3000	2.5	2.04	52.0	3500	495	430	730	500
630	5.5	2.6	50.0	3200	0.50	0.8	1.88	51.5	3500	2.5	2.04	55.0	4050	560	480	840	500
800	5.5	2.8	54.0	3880	0.60	0.8	2.04	56.0	4200	2.5	2.2	60.0	4800	620	530	960	500
1000	5.5	2.8	59.0	4600	0.60	0.8	2.2	61.0	5000	2.5	2.36	65.0	5650	680	580	1070	500

TABLE 12 - 11 / 11 KV (UE) HT XLPE SINGLE CORE COPPER CONDUCTOR CABLES

"POLYCAB" SINGLE CORE COPPER CONDUCTOR, XLPE INSULATED, UNARMOURED & ARMOURED CABLES CONFORMING TO IS: 7098 PART-2/1985:

Nominal Size of Conductor	Nominal Thickness of XLPE Insulation	UNARMOURED CABLE			Minimum Thickness of Inner Sheath	ALUMINIUM STRIP ARMOURED CABLE				ALUMINIUM ROUND WIRE ARMOURED CABLE				CURRENT CARRYING CAPACITY			*Normal Delivery Length.
		Nominal Thickness of PVC Outer Sheath	Approx. Overall Diaeter of Cable.	Approx. Weight of Cable.		Nominal Dimesion of Strip	Minimum Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx. Weight of Cable.	Nominal Dimesion of Round Wire	Minimum Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx. Weight of Cable.	In Ground at 30° C.	In Duct at 30° C.	In Air at 40° C.	
Sq.mm.	mm	mm	mm	Kg/Km	mm	mm	mm	mm	Kg/Km	mm	mm	mm	Kg/Km	Amps.	Amps.	Amps.	Mtrs.
70	5.5	2.0	28.5	1300	0.30	0.8	1.56	30.0	1500	1.6	1.56	31.5	1600	225	195	275	500
95	5.5	2.0	30.0	1550	0.30	0.8	1.56	32.0	1800	2.0	1.56	34.0	1950	265	235	340	500
120	5.5	2.2	32.0	1900	0.40	0.8	1.56	33.5	2050	2.0	1.56	36.0	2250	300	265	390	500
150	5.5	2.2	33.5	2200	0.40	0.8	1.56	35.0	2400	2.0	1.56	37.0	2600	335	295	440	500
185	5.5	2.2	35.5	2600	0.40	0.8	1.56	37.0	2750	2.0	1.56	39.0	3000	380	330	510	500
240	5.5	2.2	37.5	3150	0.40	0.8	1.56	39.0	3350	2.0	1.72	42.0	3650	435	380	600	500
300	5.5	2.2	39.5	3750	0.40	0.8	1.72	41.5	4000	2.0	1.72	44.0	4250	490	425	680	500
400	5.5	2.4	43.0	4800	0.50	0.8	1.72	45.0	5100	2.0	1.88	47.5	5400	550	480	790	500
500	5.5	2.4	46.0	5800	0.50	0.8	1.88	48.0	6100	2.5	2.04	52.0	6600	610	530	910	500
630	5.5	2.6	50.0	7100	0.50	0.8	1.88	51.5	7400	2.5	2.04	55.0	7950	680	580	1030	500
800	5.5	2.8	54.0	8850	0.60	0.8	2.04	56.0	9150	2.5	2.2	60.0	9750	740	630	1140	500
1000	5.5	2.8	59.0	10800	0.60	0.8	2.2	61.0	11200	2.5	2.36	65.0	11850	790	670	1250	500

The above data is approximate and subject to manufacturing tolerance.

* Delivery Length tolerance is ± 5 %. Length more than normal as per customer request.

TABLE 13 - 12.7/22 KV (E) HT XLPE SINGLE CORE ALUMINIUM CONDUCTOR CABLES

"POLYCAB" SINGLE CORE ALUMINIUM CONDUCTOR, XLPE INSULATED, UNARMOURED & ARMOURED CABLES CONFORMING TO IS: 7098 PART-2/1985:

Nominal Size of Conductor	Nominal Thickness of XLPE Insulation	UNARMOURED CABLE			Minimum Thickness of Inner Sheath	ALUMINIUM STRIP ARMOURED CABLE				ALUMINIUM ROUND WIRE ARMOURED CABLE				CURRENT CARRYING CAPACITY			*Normal Delivery Length.
		Nominal Thickness of PVC Outer Sheath	Approx. Overall Diaeter of Cable.	Approx. Weight of Cable.		Nominal Dimesion of Strip	Minimum Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx. Weight of Cable.	Nominal Dimesion of Round Wire	Minimum Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx. Weight of Cable.	In Ground at 30° C.	In Duct at 30° C.	In Air at 40° C.	
Sq.mm.	mm	mm	mm	Kg/Km	mm	mm	mm	mm	Kg/Km	mm	mm	mm	Kg/Km	Amps.	Amps.	Amps.	Mtrs.
95	6.0	2.2	32.0	1100	0.40	0.8	1.56	33.0	1250	2.0	1.56	36.0	1450	205	180	270	500
120	6.0	2.2	34.0	1200	0.40	0.8	1.56	35.0	1400	2.0	1.56	37.5	1600	230	200	310	500
150	6.0	2.2	35.0	1350	0.40	0.8	1.56	36.0	1530	2.0	1.56	39.0	1750	260	225	350	500
185	6.0	2.2	37.0	1500	0.40	0.8	1.56	38.0	1700	2.0	1.72	41.0	2000	290	255	400	500
240	6.0	2.2	39.0	1750	0.40	0.8	1.56	40.5	1950	2.0	1.72	43.0	2250	335	290	470	500
300	6.0	2.2	41.0	2000	0.40	0.8	1.72	43.0	2250	2.0	1.72	45.0	2500	380	325	540	500
400	6.0	2.4	45.0	2400	0.50	0.8	1.88	47.0	2700	2.0	1.88	49.0	3000	430	370	630	500
500	6.0	2.6	48.0	2850	0.50	0.8	1.88	50.0	3100	2.5	2.04	53.5	3650	485	420	730	500
630	6.0	2.6	51.5	3300	0.50	0.8	2.04	54.0	3700	2.5	2.04	57.0	4150	550	470	840	500
800	6.0	2.8	56.0	4000	0.60	0.8	2.04	58.0	4350	2.5	2.2	61.0	5000	610	520	950	500
1000	6.0	3.0	61.0	4800	0.60	0.8	2.2	62.5	5150	2.5	2.36	66.0	5800	660	560	1060	500

TABLE 14 - 12.7 / 22 KV (E) HT XLPE SINGLE CORE COPPER CONDUCTOR CABLES

"POLYCAB" SINGLE CORE COPPER CONDUCTOR, XLPE INSULATED, UNARMOURED & ARMOURED CABLES CONFORMING TO IS: 7098 PART-2/1985:

Nominal Size of Conductor	Nominal Thickness of XLPE Insulation	UNARMOURED CABLE			Minimum Thickness of Inner Sheath	ALUMINIUM STRIP ARMOURED CABLE				ALUMINIUM ROUND WIRE ARMOURED CABLE				CURRENT CARRYING CAPACITY			*Normal Delivery Length.
		Nominal Thickness of PVC Outer Sheath	Approx. Overall Diaeter of Cable.	Approx. Weight of Cable.		Nominal Dimesion of Strip	Minimum Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx. Weight of Cable.	Nominal Dimesion of Round Wire	Minimum Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx. Weight of Cable.	In Ground at 30° C.	In Duct at 30° C.	In Air at 40° C.	
Sq.mm.	mm	mm	mm	Kg/Km	mm	mm	mm	mm	Kg/Km	mm	mm	mm	Kg/Km	Amps.	Amps.	Amps.	Mtrs.
95	6.0	2.2	32.0	1650	0.40	0.8	1.56	33.0	1850	2.0	1.56	36.0	2050	265	230	345	500
120	6.0	2.2	34.0	1950	0.40	0.8	1.56	35.0	2150	2.0	1.56	37.5	2350	300	260	400	500
150	6.0	2.2	35.0	2250	0.40	0.8	1.56	36.0	2450	2.0	1.56	39.0	2700	330	290	450	500
185	6.0	2.2	37.0	2650	0.40	0.8	1.56	38.0	2850	2.0	1.72	41.0	3150	375	325	510	500
240	6.0	2.2	39.0	3200	0.40	0.8	1.56	40.5	3450	2.0	1.72	43.0	3750	430	370	600	500
300	6.0	2.2	41.0	3850	0.40	0.8	1.72	43.0	4100	2.0	1.72	45.0	4350	480	415	690	500
400	6.0	2.4	45.0	4900	0.50	0.8	1.88	47.0	5200	2.0	1.88	49.0	5500	540	465	790	500
500	6.0	2.6	48.0	5950	0.50	0.8	1.88	50.0	6200	2.5	2.04	53.5	6750	600	520	910	250
630	6.0	2.6	51.5	7200	0.50	0.8	2.04	54.0	7600	2.5	2.04	57.0	8050	660	570	1020	250
800	6.0	2.8	56.0	8950	0.60	0.8	2.04	58.0	9300	2.5	2.2	61.0	9900	720	620	1140	250
1000	6.0	3.0	61.0	11000	0.60	0.8	2.2	62.5	11350	2.5	2.36	66.0	12000	760	660	1240	200

The above data is approximate and subject to manufacturing tolerance.

* Delivery Length tolerance is ± 5 %. Length more than normal as per customer request.

TABLE 15 - 19 / 33 KV (E) HT XLPE SINGLE CORE ALUMINIUM CONDUCTOR CABLES

"POLYCAB" SINGLE CORE ALUMINIUM CONDUCTOR, XLPE INSULATED, UNARMOURED & ARMOURED CABLES CONFORMING TO IS: 7098 PART-2/1985:

Nominal Size of Conductor	Nominal Thickness of XLPE Insulation	UNARMOURED CABLE			Minimum Thickness of Inner Sheath	ALUMINIUM STRIP ARMOURED CABLE				ALUMINIUM ROUND WIRE ARMOURED CABLE				CURRENT CARRYING CAPACITY			*Normal Delivery Length.
		Nominal Thickness of PVC Outer Sheath	Approx. Overall Diaeter of Cable.	Approx. Weight of Cable.		Nominal Dimesion of Strip	Minimum Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx. Weight of Cable.	Nominal Dimesion of Round Wire	Minimum Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx. Weight of Cable.	In Ground at 30° C.	In Duct at 30° C.	In Air at 40° C.	
Sq.mm.	mm	mm	mm	Kg/Km	mm	mm	mm	mm	Kg/Km	mm	mm	mm	Kg/Km	Amps.	Amps.	Amps.	Mtrs.
95	8.8	2.2	37.5	1400	0.40	0.8	1.56	39.0	1600	2.0	1.72	41.5	1900	200	180	270	500
120	8.8	2.2	39.0	1550	0.40	0.8	1.72	41.0	1800	2.0	1.72	43.0	2050	230	200	310	500
150	8.8	2.2	40.0	1700	0.40	0.8	1.72	42.0	1950	2.0	1.72	44.5	2200	260	225	350	500
185	8.8	2.4	43.0	1900	0.50	0.8	1.72	44.5	2200	2.0	1.88	47.0	2500	290	255	400	500
240	8.8	2.4	45.0	2200	0.50	0.8	1.88	47.0	2500	2.0	1.88	49.5	2760	335	290	470	500
300	8.8	2.6	48.0	2500	0.50	0.8	1.88	49.0	2750	2.0	2.04	52.0	3100	380	325	540	500
400	8.8	2.6	51.0	2900	0.50	0.8	2.04	52.5	3250	2.0	2.04	55.0	3550	430	370	630	500
500	8.8	2.8	54.0	3400	0.60	0.8	2.04	56.0	3700	2.5	2.2	60.0	4250	485	420	730	500
630	8.8	2.8	57.5	3900	0.60	0.8	2.2	60.0	4300	2.5	2.36	63.0	4900	550	470	840	500
800	8.8	3.0	62.0	4600	0.60	0.8	2.36	64.0	5050	2.5	2.36	67.0	5600	610	520	950	500
1000	8.8	3.2	67.0	5450	0.70	0.8	2.36	69.0	5900	2.5	2.52	72.5	6550	660	560	1060	500

TABLE 16 - 19 / 33 KV (E) HT XLPE SINGLE CORE COPPER CONDUCTOR CABLES

"POLYCAB" SINGLE CORE COPPER CONDUCTOR, XLPE INSULATED, UNARMOURED & ARMOURED CABLES CONFORMING TO IS: 7098 PART-2/1985:

Nominal Size of Conductor	Nominal Thickness of XLPE Insulation	UNARMOURED CABLE			Minimum Thickness of Inner Sheath	ALUMINIUM STRIP ARMOURED CABLE				ALUMINIUM ROUND WIRE ARMOURED CABLE				CURRENT CARRYING CAPACITY			*Normal Delivery Length.
		Nominal Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx. Weight of Cable.		Nominal Dimension of Strip	Minimum Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx. Weight of Cable.	Nominal Dimension of Round Wire	Minimum Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx. Weight of Cable.	In Ground at 30° C.	In Duct at 30° C.	In Air at 40° C.	
Sq.mm.	mm	mm	mm	Kg/Km	mm	mm	mm	mm	Kg/Km	mm	mm	mm	Kg/Km	Amps.	Amps.	Amps.	Mtrs.
95	8.8	2.2	37.5	2000	0.40	0.8	1.56	39.0	2200	2.0	1.72	41.5	2550	265	230	345	500
120	8.8	2.2	39.0	2300	0.40	0.8	1.72	41.0	2550	2.0	1.72	43.0	2800	300	260	400	500
150	8.8	2.2	40.0	2600	0.40	0.8	1.72	42.0	2850	2.0	1.72	44.5	3100	330	290	450	500
185	8.8	2.4	43.0	3050	0.50	0.8	1.72	44.5	3300	2.0	1.88	47.0	3650	375	325	510	500
240	8.8	2.4	45.0	3650	0.50	0.8	1.88	47.0	4000	2.0	1.88	49.5	4250	430	370	600	500
300	8.8	2.6	48.0	4350	0.50	0.8	1.88	49.0	4600	2.0	2.04	52.0	4950	480	415	690	500
400	8.8	2.6	51.0	5350	0.50	0.8	2.04	52.5	5700	2.0	2.04	55.0	6050	540	465	790	250
500	8.8	2.8	54.0	6450	0.60	0.8	2.04	56.0	6800	2.5	2.2	60.0	7350	600	520	910	250
630	8.8	2.8	57.5	7000	0.60	0.8	2.2	60.0	8200	2.5	2.36	63.0	8800	660	570	1020	250
800	8.8	3.0	62.0	9550	0.60	0.8	2.36	64.0	10000	2.5	2.36	67.0	10600	720	620	1140	250
1000	8.8	3.2	67.0	11600	0.70	0.8	2.36	69.0	12100	2.5	2.52	72.5	12750	760	660	1240	200

The above data is approximate and subject to manufacturing tolerance.

* Delivery Length tolerance is ± 5 %. Length more than normal as per customer request.

TABLE 17 - 33 / 33 KV (UE) HT XLPE SINGLE CORE ALUMINIUM CONDUCTOR CABLE

"POLYCAB" SINGLE CORE ALUMINIUM CONDUCTOR, XLPE INSULATED, UNARMOURED & ARMOURED CABLES CONFORMING TO IS: 7098 PART-2/1985:

Nominal Size of Conductor	Nominal Thickness of XLPE Insulation	UNARMOURED CABLE			Minimum Thickness of Inner Sheath	ALUMINIUM STRIP ARMOURED CABLE				ALUMINIUM ROUND WIRE ARMOURED CABLE				CURRENT CARRYING CAPACITY			*Normal Delivery Length.
		Nominal Thickness of PVC Outer Sheath	Approx. Overall Diaeter of Cable.	Approx. Weight of Cable.		Nominal Dimesion of Strip	Minimum Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx. Weight of Cable.	Nominal Dimesion of Round Wire	Minimum Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx. Weight of Cable.	In Ground at 30° C.	In Duct at 30° C.	In Air at 40° C.	
Sq.mm.	mm	mm	mm	Kg/Km	mm	mm	mm	mm	Kg/Km	mm	mm	mm	Kg/Km	Amps.	Amps.	Amps.	Mtrs.
120	9.5	2.2	41.5	1700	0.40	0.8	1.72	43.0	2000	2.0	1.72	45.5	2250	230	200	310	500
150	9.5	2.4	43.0	1900	0.40	0.8	1.72	44.5	2150	2.0	1.88	47.5	2500	260	225	350	500
185	9.5	2.4	45.0	2100	0.50	0.8	1.72	46.5	2400	2.0	1.88	49.5	2700	290	255	400	500
240	9.5	2.4	47.5	2350	0.50	0.8	1.88	49.5	2700	2.5	2.04	53.0	3200	335	290	470	500
300	9.5	2.6	50.0	2650	0.50	0.8	1.88	51.5	3000	2.5	2.04	55.0	3500	380	325	540	500
400	9.5	2.6	53.0	3100	0.50	0.8	2.04	55.0	3450	2.5	2.2	58.5	4000	430	370	630	500
500	9.5	2.8	56.5	3600	0.60	0.8	2.04	58.0	3950	2.5	2.2	62.0	4550	485	420	730	500
630	9.5	3.0	60.0	4200	0.60	0.8	2.2	61.5	4550	2.5	2.36	65.5	5200	550	470	840	500
800	9.5	3.0	64.0	4850	0.60	0.8	2.36	66.0	5300	3.15	2.52	71.0	6200	610	520	950	500
1000	9.5	3.2	69.0	5700	0.70	0.8	2.52	71.0	6250	3.15	2.68	76.0	7250	660	560	1060	500

TABLE 18 - 33 / 33 KV (UE) HT XLPE SINGLE CORE COPPER CONDUCTOR CABLE

"POLYCAB" SINGLE CORE COPPER CONDUCTOR, XLPE INSULATED, UNARMOURED & ARMOURED CABLES CONFORMING TO IS: 7098 PART-2/1985:

Nominal Size of Conductor	Nominal Thickness of XLPE Insulation	UNARMOURED CABLE			Minimum Thickness of Inner Sheath	ALUMINIUM STRIP ARMOURED CABLE				ALUMINIUM ROUND WIRE ARMOURED CABLE				CURRENT CARRYING CAPACITY			*Normal Delivery Length.
		Nominal Thickness of PVC Outer Sheath	Approx. Overall Diaeter of Cable.	Approx. Weight of Cable.		Nominal Dimesion of Strip	Minimum Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx. Weight of Cable.	Nominal Dimesion of Round Wire	Minimum Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx. Weight of Cable.	In Ground at 30° C.	In Duct at 30° C.	In Air at 40° C.	
Sq.mm.	mm	mm	mm	Kg/Km	mm	mm	mm	mm	Kg/Km	mm	mm	mm	Kg/Km	Amps.	Amps.	Amps.	Mtrs.
120	9.5	2.2	41.5	2450	0.40	0.8	1.72	43.0	2750	2.0	1.72	45.5	3000	300	260	400	500
150	9.5	2.4	43.0	2850	0.40	0.8	1.72	44.5	3050	2.0	1.88	47.5	3400	330	290	450	500
185	9.5	2.4	45.0	3250	0.50	0.8	1.72	46.5	3500	2.0	1.88	49.5	3850	375	325	510	500
240	9.5	2.4	47.5	3850	0.50	0.8	1.88	49.5	4200	2.5	2.04	53.0	4650	430	370	600	500
300	9.5	2.6	50.0	4550	0.50	0.8	1.88	51.5	4850	2.5	2.04	55.0	5350	480	415	690	500
400	9.5	2.6	53.0	5600	0.50	0.8	2.04	55.0	5950	2.5	2.2	58.5	6500	540	465	790	250
500	9.5	2.8	56.5	6700	0.60	0.8	2.04	58.0	7050	2.5	2.2	62.0	7650	600	520	910	250
630	9.5	3.0	60.0	8100	0.60	0.8	2.2	61.5	8450	2.5	2.36	65.5	9100	660	570	1020	250
800	9.5	3.0	64.0	9800	0.60	0.8	2.36	66.0	10250	3.15	2.52	71.0	11200	720	620	1140	250
1000	9.5	3.2	69.0	11900	0.70	0.8	2.52	71.0	12450	3.15	2.68	76.0	13450	760	660	1240	200

The above data is approximate and subject to manufacturing tolerance.

* Delivery Length tolerance is ± 5 %. Length more than normal as per customer request.

TABLE 19 - 1.9/3.3 KV (E) & 3.3/3.3 KV (UE) HT XLPE THREE CORE ALUMINIUM CONDUCTOR CABLES

"POLYCAB" THREE CORE ALUMINIUM CONDUCTOR, XLPE INSULATED, UNARMOURED & ARMOURED SCREENED CABLES CONFORMING TO IS: 7098 PART-2/1985:

Nominal Size of Conductor	Nominal Thickness of XLPE Insulation	Minimum Thickness of PVC Inner Sheath	UNARMOURED CABLE			FORMED WIRE / STRIP ARMOURED CABLE				ROUND WIRE ARMOURED CABLE				CURRENT CARRYING CAPACITY			*Normal Delivery Length.
			Nomonal Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx Weight of Cable	Nominal Dimension of GI Flat Strip	Minimum Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx. Weight of Cable.	Nominal Dimension of GI Round Wire	Minimum Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx. Weight of Cable.	In Ground at 30° C.	In Duct at 30° C.	In Air at 40° C.	
Sq.mm.	mm	mm	mm	Kg/Km	mm	mm	mm	mm	Kg/Km	mm	mm	mm	Kg/Km	Amps.	Amps.	Amps.	Mtrs.
35	2.2	0.4	2.2	38.0	1500	0.8	1.56	37.0	1950	2.0	1.72	40.5	2600	115	97	125	500
50	2.2	0.4	2.2	40.0	1700	0.8	1.72	39.5	2200	2.0	1.72	42.5	2900	130	115	150	500
70	2.2	0.5	2.4	44.5	2150	0.8	1.72	44.0	2650	2.0	1.88	47.0	3450	160	140	190	500
95	2.2	0.5	2.6	48.5	2600	0.8	1.88	47.5	3150	2.5	2.04	51.5	4400	190	165	230	500
120	2.2	0.5	2.6	52.0	3000	0.8	2.04	51.5	3650	2.5	2.04	55.5	5000	220	190	260	500
150	2.2	0.6	2.8	55.5	3500	0.8	2.04	54.5	4100	2.5	2.2	58.5	5550	245	210	295	500
185	2.2	0.6	3.0	60.0	4150	0.8	2.2	59.0	4800	2.5	2.36	63.0	6350	275	240	335	500
240	2.2	0.7	3.0	65.0	4900	0.8	2.36	64.5	5750	2.5	2.36	68.0	7350	315	275	395	500
300	2.2	0.7	3.2	70.0	5850	0.8	2.52	70.0	6650	3.15	2.68	75.0	9250	355	310	450	500
400	2.2	0.7	3.6	78.0	7300	0.8	2.68	76.5	8100	3.15	2.84	82.0	11000	400	350	520	500

TABLE 20 - 1.9/3.3 KV (E) & 3.3/3.3 (UE) KV HT XLPE THREE CORE COPPER CONDUCTOR CABLES

"POLYCAB" THREE CORE COPPER CONDUCTOR, XLPE INSULATED, UNARMOURED & ARMOURED SCREENED CABLES CONFORMING TO IS: 7098 PART-2/1985:

Nominal Size of Conductor	Nominal Thickness of XLPE Insulation	Minimum Thickness of PVC Inner Sheath	UNARMOURED CABLE			FORMED WIRE / STRIP ARMOURED CABLE				ROUND WIRE ARMOURED CABLE				CURRENT CARRYING CAPACITY			*Normal Delivery Length.
			Nomonal Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx Weight of Cable	Nominal Dimension of GI Flat Strip	Minimum Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx. Weight of Cable.	Nominal Dimension of GI Round Wire	Minimum Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx. Weight of Cable.	In Ground at 30° C.	In Duct at 30° C.	In Air at 40° C.	
Sq.mm.	mm	mm	mm	Kg/Km	mm	mm	mm	mm	Kg/Km	mm	mm	mm	Kg/Km	Amps.	Amps.	Amps.	Mtrs.
35	2.2	0.4	2.2	38.0	2150	0.8	1.56	37.0	2600	2.0	1.72	40.5	3250	145	125	165	500
50	2.2	0.4	2.2	40.0	2650	0.8	1.72	39.5	3150	2.0	1.72	42.5	3800	170	150	195	500
70	2.2	0.5	2.4	44.5	3450	0.8	1.72	44.0	3950	2.0	1.88	47.0	4750	210	180	240	500
95	2.2	0.5	2.6	48.5	4350	0.8	1.88	47.5	4950	2.5	2.04	51.5	6150	250	215	295	500
120	2.2	0.5	2.6	52.0	5250	0.8	2.04	51.5	5900	2.5	2.04	55.5	7200	280	240	335	500
150	2.2	0.6	2.8	55.5	6300	0.8	2.04	54.5	6900	2.5	2.2	58.5	8350	310	270	380	500
185	2.2	0.6	3.0	60.0	7600	0.8	2.2	59.0	8250	2.5	2.36	63.0	9800	350	305	430	500
240	2.2	0.7	3.0	65.0	9350	0.8	2.36	64.5	10250	2.5	2.36	68.0	11800	400	350	500	500
300	2.2	0.7	3.2	70.0	11400	0.8	2.52	70.0	12250	3.15	2.68	75.0	14850	445	390	510	500
400	2.2	0.7	3.6	78.0	14750	0.8	2.68	76.5	15550	3.15	2.84	82.0	18450	500	440	650	250

The above data is approximate and subject to manufacturing tolerance.

* Delivery Length tolerance is ± 5 %. Length more than normal as per customer request.

TABLE 21 - 3.8 / 6.6 KV (E) HT XLPE THREE CORE ALUMINIUM CONDUCTOR CABLES

"POLYCAB" THREE CORE ALUMINIUM CONDUCTOR, XLPE INSULATED, UNARMOURED & ARMOURED CABLES CONFORMING TO IS: 7098 PART-2/1985:

Nominal Size of Conductor	Nominal Thickness of XLPE Insulation	Minimum Thickness of PVC Inner Sheath	UNARMOURED CABLE			FORMED WIRE / STRIP ARMOURED CABLE				ROUND WIRE ARMOURED CABLE				CURRENT CARRYING CAPACITY			*Normal Delivery Length.
			Nomonal Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx Weight of Cable	Nominal Dimension of GI Flat Strip	Minimum Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx. Weight of Cable.	Nominal Dimension of GI Round Wire	Minimum Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx. Weight of Cable.	In Ground at 30° C.	In Duct at 30° C.	In Air at 40° C.	
Sq.mm.	mm	mm	mm	Kg/Km	mm	mm	mm	mm	Kg/Km	mm	mm	mm	Kg/Km	Amps.	Amps.	Amps.	Mtrs.
35	2.8	0.4	2.2	40.0	1600	0.8	1.72	40.0	2200	2.0	1.72	43.0	2800	115	97	125	500
50	2.8	0.5	2.4	43.0	1950	0.8	1.72	42.5	2500	2.0	1.88	45.5	3200	130	115	150	500
70	2.8	0.5	2.6	47.0	2350	0.8	1.88	47.0	3000	2.0	1.88	49.5	3700	160	140	190	500
95	2.8	0.5	2.6	51.0	2800	0.8	1.88	50.5	3400	2.5	2.04	54.0	4700	190	165	230	500
120	2.8	0.6	2.8	55.0	3300	0.8	2.04	55.0	4000	2.5	2.20	58.5	5400	220	190	260	500
150	2.8	0.6	3.0	58.0	3800	0.8	2.2	58.0	4500	2.5	2.2	61.0	5900	245	210	295	500
185	2.8	0.6	3.2	63.0	4400	0.8	2.2	62.0	5150	2.5	2.36	66.0	6700	275	240	335	500
240	2.8	0.7	3.4	68.0	5300	0.8	2.36	67.5	6100	3.15	2.52	73.0	8600	315	275	395	500
300	3.0	0.7	3.6	74.0	6300	0.8	2.52	73.5	7160	3.15	2.68	78.5	9900	355	310	450	250
400	3.3	0.7	3.8	83.0	8000	0.8	2.84	82.0	9000	4.0	3.0	89.0	13200	400	350	520	250

TABLE 22 - 3.8/6.6 KV (E) HT XLPE THREE CORE COPPER CONDUCTOR CABLES

"POLYCAB" THREE CORE COPPER CONDUCTOR, XLPE INSULATED, UNARMOURED & ARMOURED CABLES CONFORMING TO IS: 7098 PART-2/1985:

Nominal Size of Conductor	Nominal Thickness of XLPE Insulation	Minimum Thickness of PVC Inner Sheath	UNARMOURED CABLE			FORMED WIRE / STRIP ARMOURED CABLE				ROUND WIRE ARMOURED CABLE				CURRENT CARRYING CAPACITY			*Normal Delivery Length.
			Nomonal Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx Weight of Cable	Nominal Dimension of GI Flat Strip	Minimum Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx. Weight of Cable.	Nominal Dimension of GI Round Wire	Minimum Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx. Weight of Cable.	In Ground at 30° C.	In Duct at 30° C.	In Air at 40° C.	
Sq.mm.	mm	mm	mm	Kg/Km	mm	mm	mm	mm	Kg/Km	mm	mm	mm	Kg/Km	Amps.	Amps.	Amps.	Mtrs.
35	2.8	0.4	2.2	40.0	2250	0.8	1.72	40.0	2850	2.0	1.72	43.0	3450	145	125	165	500
50	2.8	0.5	2.4	43.0	2850	0.8	1.72	42.5	3400	2.0	1.88	45.5	4150	170	150	195	500
70	2.8	0.5	2.6	47.0	3650	0.8	1.88	47.0	4250	2.0	1.88	49.5	5000	210	180	240	500
95	2.8	0.5	2.6	51.0	4550	0.8	1.88	50.5	5200	2.5	2.04	54.0	6500	250	215	295	500
120	2.8	0.6	2.8	55.0	5500	0.8	2.04	55.0	6200	2.5	2.20	58.5	7600	280	240	335	500
150	2.8	0.6	3.0	58.0	6550	0.8	2.2	58.0	7250	2.5	2.2	61.0	8700	310	270	380	500
185	2.8	0.6	3.2	63.0	7850	0.8	2.2	62.0	8600	2.5	2.36	66.0	10150	350	305	430	500
240	2.8	0.7	3.4	68.0	9800	0.8	2.36	67.5	10550	3.15	2.52	73.0	13050	400	350	500	500
300	3.0	0.7	3.6	74.0	11900	0.8	2.52	73.5	12750	3.15	2.68	78.5	15450	445	390	570	250
400	3.3	0.7	3.8	83.0	15400	0.8	2.84	82.0	16400	4.0	3.0	89.0	20650	500	440	650	200

The above data is approximate and subject to manufacturing tolerance.

* Delivery Length tolerance is ± 5 %. Length more than normal as per customer request.

TABLE 23 - 6.35 / 11 KV (E) HT XLPE THREE CORE ALUMINIUM CONDUCTOR CABLES

"POLYCAB" THREE CORE ALUMINIUM CONDUCTOR, XLPE INSULATED, UNARMOURED & ARMOURED CABLES CONFORMING TO IS: 7098 PART-2/1985:

Nominal Size of Conductor	Nominal Thickness of XLPE Insulation	Minimum Thickness of PVC Inner Sheath	UNARMOURED CABLE			FORMED WIRE / STRIP ARMOURED CABLE				ROUND WIRE ARMOURED CABLE				CURRENT CARRYING CAPACITY			*Normal Delivery Length.
			Nomonal Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx Weight of Cable	Nominal Dimension of GI Flat Strip	Minimum Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx. Weight of Cable.	Nominal Dimension of GI Round Wire	Minimum Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx. Weight of Cable.	In Ground at 30° C.	In Duct at 30° C.	In Air at 40° C.	
Sq.mm.	mm	mm	mm	Kg/Km	mm	mm	mm	mm	Kg/Km	mm	mm	mm	Kg/Km	Amps.	Amps.	Amps.	Mtrs.
35	3.6	0.5	2.4	42.5	1950	0.8	1.72	42.5	2500	2.0	1.88	45.5	3250	115	97	125	500
50	3.6	0.5	2.6	46.0	2250	0.8	1.88	46.0	2850	2.5	2.04	49.5	4000	130	115	150	500
70	3.6	0.5	2.6	48.5	2650	0.8	1.88	49.0	3300	2.5	2.04	52.5	4600	160	140	190	500
95	3.6	0.6	2.8	53.0	3150	0.8	2.04	53.0	3850	2.5	2.20	56.5	5250	190	165	230	500
120	3.6	0.6	2.8	56.0	3600	0.8	2.2	56.0	4400	2.5	2.20	59.5	5850	220	190	260	500
150	3.6	0.6	3.0	59.0	4100	0.8	2.2	59.0	4900	2.5	2.36	63.0	6450	245	210	295	500
185	3.6	0.7	3.2	63.0	4850	0.8	2.36	63.0	5650	3.15	2.52	68.0	8100	275	240	335	500
240	3.6	0.7	3.4	68.0	5700	0.8	2.52	68.0	6600	3.15	2.68	73.0	9250	315	275	395	500
300	3.6	0.7	3.6	73.0	6650	0.8	2.68	73.0	7600	3.15	2.84	78.0	10400	355	310	450	250
400	3.6	0.7	3.8	80.0	8100	0.8	2.84	80.0	9100	4.0	3.0	86.5	13450	400	350	520	250

TABLE 24 - 6.35 / 11 KV (E) HT XLPE THREE CORE COPPER CONDUCTOR CABLES

"POLYCAB" THREE CORE COPPER CONDUCTOR, XLPE INSULATED, UNARMOURED & ARMOURED CABLES CONFORMING TO IS: 7098 PART-2/1985:

Nominal Size of Conductor	Nominal Thickness of XLPE Insulation	Minimum Thickness of PVC Inner Sheath	UNARMOURED CABLE			FORMED WIRE / STRIP ARMOURED CABLE				ROUND WIRE ARMOURED CABLE				CURRENT CARRYING CAPACITY			*Normal Delivery Length.
			Nomonal Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx Weight of Cable	Nominal Dimension of GI Flat Strip	Minimum Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx. Weight of Cable.	Nominal Dimension of GI Round Wire	Minimum Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx. Weight of Cable.	In Ground at 30° C.	In Duct at 30° C.	In Air at 40° C.	
Sq.mm.	mm	mm	mm	Kg/Km	mm	mm	mm	mm	Kg/Km	mm	mm	mm	Kg/Km	Amps.	Amps.	Amps.	Mtrs.
35	3.6	0.5	2.4	42.5	2600	0.8	1.72	42.5	3150	2.0	1.88	45.5	3900	145	125	165	500
50	3.6	0.5	2.6	46.0	3150	0.8	1.88	46.0	3750	2.5	2.04	49.5	4950	170	150	195	500
70	3.6	0.5	2.6	48.5	3950	0.8	1.88	49.0	4600	2.5	2.04	52.5	5900	210	180	240	500
95	3.6	0.6	2.8	53.0	4950	0.8	2.04	53.0	5600	2.5	2.20	56.5	7000	250	215	295	500
120	3.6	0.6	2.8	56.0	5850	0.8	2.2	56.0	6650	2.5	2.20	59.5	8100	280	240	335	500
150	3.6	0.6	3.0	59.0	6900	0.8	2.2	59.0	7650	2.5	2.36	63.0	9250	310	270	380	500
185	3.6	0.7	3.2	63.0	8300	0.8	2.36	63.0	9100	3.15	2.52	68.0	11550	350	305	430	500
240	3.6	0.7	3.4	68.0	10200	0.8	2.52	68.0	11050	3.15	2.68	73.0	13700	400	350	500	250
300	3.6	0.7	3.6	73.0	12200	0.8	2.68	73.0	13150	3.15	2.84	78.0	15950	445	390	570	250
400	3.6	0.7	3.8	80.0	15550	0.8	2.84	80.0	16550	4.0	3.0	86.5	20900	500	440	650	250

The above data is approximate and subject to manufacturing tolerance.

* Delivery Length tolerance is ± 5 %. Length more than normal as per customer request.

TABLE 25 - 11 / 11 KV (UE) HT XLPE THREE CORE ALUMINIUM CONDUCTOR CABLES

"POLYCAB" THREE CORE ALUMINIUM CONDUCTOR, XLPE INSULATED, UNARMOURED & ARMOURED CABLES CONFORMING TO IS: 7098 PART-2/1985:

Nominal Size of Conductor	Nominal Thickness of XLPE Insulation	Minimum Thickness of PVC Inner Sheath	UNARMOURED CABLE			FORMED WIRE / STRIP ARMOURED CABLE				ROUND WIRE ARMOURED CABLE				CURRENT CARRYING CAPACITY			*Normal Delivery Length.
			Nomonal Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx Weight of Cable	Nominal Dimension of GI Flat Strip	Minimum Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx. Weight of Cable.	Nominal Dimension of GI Round Wire	Minimum Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx. Weight of Cable.	In Ground at 30° C.	In Duct at 30° C.	In Air at 40° C.	
Sq.mm.	mm	mm	mm	Kg/Km	mm	mm	mm	mm	Kg/Km	mm	mm	mm	Kg/Km	Amps.	Amps.	Amps.	Mtrs.
70	5.5	0.6	3.0	58.0	3550	0.8	2.2	58.0	4300	2.5	2.36	61.5	5900	160	140	190	500
95	5.5	0.6	3.2	62.0	4100	0.8	2.36	62.0	4900	3.15	2.52	66.5	7250	190	165	230	500
120	5.5	0.7	3.2	65.0	4650	0.8	2.36	65.0	5500	3.15	2.52	70.0	8000	220	190	260	500
150	5.5	0.7	3.4	68.5	5200	0.8	2.52	68.5	6100	3.15	2.68	73.0	8650	245	210	295	500
185	5.5	0.7	3.4	71.5	5900	0.8	2.68	71.5	6950	3.15	2.84	77.0	9650	275	240	335	500
240	5.5	0.7	3.6	77.0	6850	0.8	2.84	77.0	7900	3.15	3.0	82.0	10850	315	275	395	250
300	5.5	0.7	3.8	81.5	7850	0.8	3.0	81.5	8950	4.0	3.0	88.0	13250	355	310	450	250
400	5.5	0.7	4.0	88.0	9400	0.8	3.0	88.0	10500	4.0	3.0	94.5	15200	400	350	520	250

TABLE 26 - 11 / 11 KV (UE) HT XLPE THREE CORE COPPER CONDUCTOR CABLES

"POLYCAB" THREE CORE COPPER CONDUCTOR, XLPE INSULATED, UNARMOURED & ARMOURED CABLES CONFORMING TO IS: 7098 PART-2/1985:

Nominal Size of Conductor	Nominal Thickness of XLPE Insulation	Minimum Thickness of PVC Inner Sheath	UNARMOURED CABLE			FORMED WIRE / STRIP ARMOURED CABLE				ROUND WIRE ARMOURED CABLE				CURRENT CARRYING CAPACITY			*Normal Delivery Length.
			Nomonal Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx Weight of Cable	Nominal Dimension of GI Flat Strip	Minimum Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx. Weight of Cable.	Nominal Dimension of GI Round Wire	Minimum Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx. Weight of Cable.	In Ground at 30° C.	In Duct at 30° C.	In Air at 40° C.	
Sq.mm.	mm	mm	mm	Kg/Km	mm	mm	mm	mm	Kg/Km	mm	mm	mm	Kg/Km	Amps.	Amps.	Amps.	Mtrs.
70	5.5	0.6	3.0	58.0	4900	0.8	2.2	58.0	5600	2.5	2.36	61.5	7150	210	180	240	500
95	5.5	0.6	3.2	62.0	5900	0.8	2.36	62.0	6700	3.15	2.52	66.5	9000	250	215	295	500
120	5.5	0.7	3.2	65.0	6900	0.8	2.36	65.0	7750	3.15	2.52	70.0	10250	280	240	335	500
150	5.5	0.7	3.4	68.5	8000	0.8	2.52	68.5	8900	3.15	2.68	73.0	11450	310	270	380	500
185	5.5	0.7	3.4	71.5	9300	0.8	2.68	71.5	10300	3.15	2.84	77.0	13100	350	305	430	250
240	5.5	0.7	3.6	77.0	11300	0.8	2.84	77.0	12350	3.15	3.0	82.0	15350	400	350	500	250
300	5.5	0.7	3.8	81.5	13400	0.8	3.0	81.5	14500	4.0	3.0	88.0	18850	445	390	570	250
400	5.5	0.7	4.0	88.0	16850	0.8	3.0	88.0	17950	4.0	3.0	94.5	22650	500	440	650	250

The above data is approximate and subject to manufacturing tolerance.

* Delivery Length tolerance is ± 5 %. Length more than normal as per customer request.

TABLE 27 - 12.7/22 KV (E) HT XLPE THREE CORE ALUMINIUM CONDUCTOR CABLES

"POLYCAB" THREE CORE ALUMINIUM CONDUCTOR, XLPE INSULATED, UNARMOURED & ARMOURED CABLES CONFORMING TO IS: 7098 PART-2/1985:

Nominal Size of Conductor	Nominal Thickness of XLPE Insulation	Minimum Thickness of PVC Inner Sheath	UNARMOURED CABLE			FORMED WIRE / STRIP ARMOURED CABLE				ROUND WIRE ARMOURED CABLE				CURRENT CARRYING CAPACITY			*Normal Delivery Length.
			Nomonal Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx Weight of Cable	Nominal Dimension of GI Flat Strip	Minimum Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx. Weight of Cable.	Nominal Dimension of GI Round Wire	Minimum Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx. Weight of Cable.	In Ground at 30° C.	In Duct at 30° C.	In Air at 40° C.	
Sq.mm.	mm	mm	mm	Kg/Km	mm	mm	mm	mm	Kg/Km	mm	mm	mm	Kg/Km	Amps.	Amps.	Amps.	Mtrs.
95	6.0	0.7	3.2	64.0	4450	0.8	2.36	64.0	5300	3.15	2.52	69.0	7750	190	170	230	500
120	6.0	0.7	3.4	67.5	5050	0.8	2.52	67.5	5900	3.15	2.68	72.0	8500	215	190	265	500
150	6.0	0.7	3.4	70.5	5550	0.8	2.68	70.5	6500	3.15	2.68	75.5	9200	240	215	300	250
185	6.0	0.7	3.6	74.0	6300	0.8	2.68	74.0	7250	3.15	2.84	79.0	10150	270	240	340	250
240	6.0	0.7	3.8	79.5	7300	0.8	2.84	79.0	8300	4.0	3.0	85.5	12600	310	275	400	250
300	6.0	0.7	4.0	84.0	8300	0.8	3.0	83.5	9350	4.0	3.0	90.0	13850	350	310	455	250
400	6.0	0.7	4.0	90.5	9850	0.8	3.0	90.5	10950	4.0	3.0	96.5	15800	395	355	530	250

TABLE 28 - 12.7 / 22 KV (E) HT XLPE THREE CORE COPPER CONDUCTOR CABLES

"POLYCAB" THREE CORE COPPER CONDUCTOR, XLPE INSULATED, UNARMOURED & ARMOURED CABLES CONFORMING TO IS: 7098 PART-2/1985:

Nominal Size of Conductor	Nominal Thickness of XLPE Insulation	Minimum Thickness of PVC Inner Sheath	UNARMOURED CABLE			FORMED WIRE / STRIP ARMOURED CABLE				ROUND WIRE ARMOURED CABLE				CURRENT CARRYING CAPACITY			*Normal Delivery Length.
			Nomonal Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx Weight of Cable	Nominal Dimension of GI Flat Strip	Minimum Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx. Weight of Cable.	Nominal Dimension of GI Round Wire	Minimum Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx. Weight of Cable.	In Ground at 30° C.	In Duct at 30° C.	In Air at 40° C.	
Sq.mm.	mm	mm	mm	Kg/Km	mm	mm	mm	mm	Kg/Km	mm	mm	mm	Kg/Km	Amps.	Amps.	Amps.	Mtrs.
95	6.0	0.7	3.2	64.0	6200	0.8	2.36	64.0	7050	3.15	2.52	69.0	9500	245	215	300	500
120	6.0	0.7	3.4	67.5	7300	0.8	2.52	67.5	8150	3.15	2.68	72.0	10750	275	245	340	500
150	6.0	0.7	3.4	70.5	8300	0.8	2.68	70.5	9300	3.15	2.68	75.5	11950	305	275	385	250
185	6.0	0.7	3.6	74.0	9750	0.8	2.68	74.0	10700	3.15	2.84	79.0	13600	345	305	435	250
240	6.0	0.7	3.8	79.5	11750	0.8	2.84	79.0	12750	4.0	3.0	85.5	17050	395	350	510	250
300	6.0	0.7	4.0	84.0	13900	0.8	3.0	83.5	14950	4.0	3.0	90.0	19400	440	390	580	250
400	6.0	0.7	4.0	90.5	17250	0.8	3.0	90.5	18400	4.0	3.0	96.5	23250	495	440	660	200

The above data is approximate and subject to manufacturing tolerance.

* Delivery Length tolerance is ± 5 %. Length more than normal as per customer request.

TABLE 29 - 19 / 33 KV (E) HT XLPE THREE CORE ALUMINIUM CONDUCTOR CABLES

"POLYCAB" THREE CORE ALUMINIUM CONDUCTOR, XLPE INSULATED, UNARMOURED & ARMOURED CABLES CONFORMING TO IS: 7098 PART-2/1985:

Nominal Size of Conductor	Nominal Thickness of XLPE Insulation	Minimum Thickness of PVC Inner Sheath	UNARMOURED CABLE			FORMED WIRE / STRIP ARMOURED CABLE				ROUND WIRE ARMOURED CABLE				CURRENT CARRYING CAPACITY			*Normal Delivery Length.
			Nomonal Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx Weight of Cable	Nominal Dimension of GI Flat Strip	Minimum Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx. Weight of Cable.	Nominal Dimension of GI Round Wire	Minimum Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx. Weight of Cable.	In Ground at 30° C.	In Duct at 30° C.	In Air at 40° C.	
Sq.mm.	mm	mm	mm	Kg/Km	mm	mm	mm	mm	Kg/Km	mm	mm	mm	Kg/Km	Amps.	Amps.	Amps.	Mtrs.
95	8.8	0.7	3.6	77.0	6050	0.8	2.84	77.0	7100	3.15	3.0	82.0	10050	190	170	230	500
120	8.8	0.7	3.8	80.5	6750	0.8	2.84	80.5	7750	4.0	3.0	86.5	12100	215	190	265	500
150	8.8	0.7	4.0	83.5	7400	0.8	3.0	83.5	8400	4.0	3.0	90.0	12800	240	215	300	250
185	8.8	0.7	4.0	87.0	8150	0.8	3.0	87.0	9250	4.0	3.0	93.0	13900	270	240	340	250
240	8.8	0.7	4.0	91.5	9150	0.8	3.0	91.5	10300	4.0	3.0	98.0	15150	310	275	400	250
300	8.8	0.7	4.0	96.0	10200	0.8	3.0	96.0	11350	4.0	3.0	102.0	16450	350	310	455	250
400	8.8	0.7	4.0	102.5	11800	0.8	3.0	102.5	13100	4.0	3.0	109.0	18550	395	355	530	250

TABLE 30 - 19 / 33 KV (E) HT XLPE THREE CORE COPPER CONDUCTOR CABLES

"POLYCAB" THREE CORE COPPER CONDUCTOR, XLPE INSULATED, UNARMOURED & ARMOURED CABLES CONFORMING TO IS: 7098 PART-2/1985:

Nominal Size of Conductor	Nominal Thickness of XLPE Insulation	Minimum Thickness of PVC Inner Sheath	UNARMOURED CABLE			FORMED WIRE / STRIP ARMOURED CABLE				ROUND WIRE ARMOURED CABLE				CURRENT CARRYING CAPACITY			*Normal Delivery Length.
			Nomonal Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx Weight of Cable	Nominal Dimension of GI Flat Strip	Minimum Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx. Weight of Cable.	Nominal Dimension of GI Round Wire	Minimum Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx. Weight of Cable.	In Ground at 30° C.	In Duct at 30° C.	In Air at 40° C.	
Sq.mm.	mm	mm	mm	Kg/Km	mm	mm	mm	mm	Kg/Km	mm	mm	mm	Kg/Km	Amps.	Amps.	Amps.	Mtrs.
95	8.8	0.7	3.6	77.0	7850	0.8	2.84	77.0	8900	3.15	3.0	82.0	11800	245	215	300	250
120	8.8	0.7	3.8	80.5	9000	0.8	2.84	80.5	10000	4.0	3.0	86.5	14300	275	245	340	250
150	8.8	0.7	4.0	83.5	10150	0.8	3.0	83.5	11200	4.0	3.0	90.0	15600	305	275	385	250
185	8.8	0.7	4.0	87.0	11600	0.8	3.0	87.0	12700	4.0	3.0	93.0	17300	345	305	435	250
240	8.8	0.7	4.0	91.5	13600	0.8	3.0	91.5	14750	4.0	3.0	98.0	19600	395	350	510	250
300	8.8	0.7	4.0	96.0	15750	0.8	3.0	96.5	16950	4.0	3.0	102.0	22000	440	390	580	200
400	8.8	0.7	4.0	102.5	19250	0.8	3.0	102.5	20550	4.0	3.0	109.0	26000	495	440	660	200

The above data is approximate and subject to manufacturing tolerance.

* Delivery Length tolerance is ± 5 %. Length more than normal as per customer request.

TABLE 31 - 33 / 33 KV (UE) HT XLPE THREE CORE ALUMINIUM CONDUCTOR CABLES

"POLYCAB" THREE CORE ALUMINIUM CONDUCTOR, XLPE INSULATED, UNARMOURED & ARMOURED CABLES CONFORMING TO IS: 7098 PART-2/1985:

Nominal Size of Conductor	Nominal Thickness of XLPE Insulation	Minimum Thickness of PVC Inner Sheath	UNARMOURED CABLE			FORMED WIRE / STRIP ARMOURED CABLE				ROUND WIRE ARMOURED CABLE				CURRENT CARRYING CAPACITY			*Normal Delivery Length.
			Nomonal Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx Weight of Cable	Nominal Dimension of GI Flat Strip	Minimum Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx. Weight of Cable.	Nominal Dimension of GI Round Wire	Minimum Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx. Weight of Cable.	In Ground at 30° C.	In Duct at 30° C.	In Air at 40° C.	
Sq.mm.	mm	mm	mm	Kg/Km	mm	mm	mm	mm	Kg/Km	mm	mm	mm	Kg/Km	Amps.	Amps.	Amps.	Mtrs.
120	9.5	0.7	4.0	84.0	7600	0.8	3.0	83.5	8650	4.0	3.0	90.0	12700	215	190	265	500
150	9.5	0.7	4.0	87.0	8150	0.8	3.0	86.5	9250	4.0	3.0	93.0	13450	240	215	300	250
185	9.5	0.7	4.0	90.0	8950	0.8	3.0	89.5	10100	4.0	3.0	96.0	14550	270	240	340	250
240	9.5	0.7	4.0	94.5	10000	0.8	3.0	94.5	11200	4.0	3.0	101.0	15850	310	275	400	250
300	9.5	0.7	4.0	99.0	11050	0.8	3.0	98.5	12300	4.0	3.0	105.0	17300	350	310	455	250
400	9.5	0.7	4.0	105.5	12750	0.8	3.0	105.0	14100	4.0	3.0	112.0	19350	395	355	530	250

TABLE 31 - 33 / 33 KV (UE) HT XLPE THREE CORE COPPER CONDUCTOR CABLES

"POLYCAB" THREE CORE COPPER CONDUCTOR, XLPE INSULATED, UNARMOURED & ARMOURED CABLES CONFORMING TO IS: 7098 PART-2/1985:

Nominal Size of Conductor	Nominal Thickness of XLPE Insulation	Minimum Thickness of PVC Inner Sheath	UNARMOURED CABLE			FORMED WIRE / STRIP ARMOURED CABLE				ROUND WIRE ARMOURED CABLE				CURRENT CARRYING CAPACITY			*Normal Delivery Length.
			Nomonal Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx Weight of Cable	Nominal Dimension of GI Flat Strip	Minimum Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx. Weight of Cable.	Nominal Dimension of GI Round Wire	Minimum Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx. Weight of Cable.	In Ground at 30° C.	In Duct at 30° C.	In Air at 40° C.	
Sq.mm.	mm	mm	mm	Kg/Km	mm	mm	mm	mm	Kg/Km	mm	mm	mm	Kg/Km	Amps.	Amps.	Amps.	Mtrs.
120	9.5	0.7	4.0	84.0	9800	0.8	3.0	83.5	10850	4.0	3.0	90.0	14950	275	245	340	250
150	9.5	0.7	4.0	87.0	10950	0.8	3.0	86.5	12000	4.0	3.0	93.0	16250	305	275	385	250
185	9.5	0.7	4.0	90.0	12400	0.8	3.0	89.5	13550	4.0	3.0	96.0	18000	345	305	435	250
240	9.5	0.7	4.0	94.5	14450	0.8	3.0	94.5	15650	4.0	3.0	101.0	20300	395	350	510	250
300	9.5	0.7	4.0	99.0	16650	0.8	3.0	98.5	17900	4.0	3.0	105.0	22900	440	390	580	200
400	9.5	0.7	4.0	105.5	20150	0.8	3.0	105.0	21550	4.0	3.0	112.0	26750	495	440	660	200

The above data is approximate and subject to manufacturing tolerance.

* Delivery Length tolerance is ± 5 %. Length more than normal as per customer request.

POLYCAB WIRES & CABLES
AN ISO 9001:2000 COMPANY

A. CABLE INSPECTION

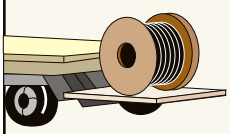
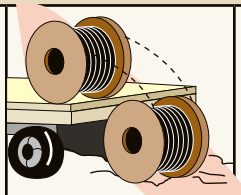
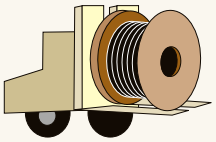
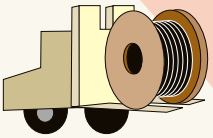
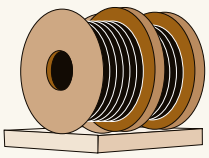
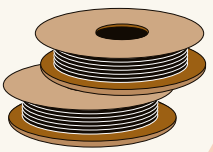
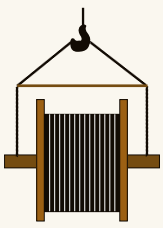
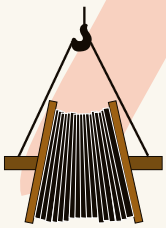
Inspect every cable reel for damage before accepting the shipment. Be particularly alert for cable damage if:

1. A reel is lying flat on its side
2. Several reels are stacked
3. Other freight is stacked on a reel
4. Nails have been driven into reel flanges to secure shipping blocks
5. A reel flange is damaged
6. A cable covering is removed, stained or damaged
7. A cable end seal is removed or damaged. A reel has been dropped (hidden damage likely)

B. CABLE HANDLING & STORAGE

Damage to cables can occur due to the incorrect handling to which the drums and cables may be subjected; causing breakdown of the drum flanges and in exceptional cases, movement of the drum barrel takes place. Once this breakdown of the drum occurs, the cable is immediately exposed to damage. Cables damaged during handling & storage can cause service failures when the subject cable is put to use.

Thus the following is a list of Do's and Don'ts that should be followed while handling and storing the cables before it is put to use.

Do's		Don'ts	
	When off loading reels from a truck, lower reels carefully using a hydraulic gate, hoist or forklift truck		Never drop reels. If reels must be rolled, roll in opposite direction of the cable wraps to keep cable from loosening on the reel.
	If a fork lift is used, approach the reel from the flange side. Position the forks such that the reel is lifted by both reel flanges. Also Consideration should be given to, Traffic patterns during off-loading & damage during the time in storage		Do not allow the lift forks to contact the cable. Care must be taken by the fork lift operator not to make sudden turns or stops.
	Cable reels should be stored on hard surfaces resting on the flanges edge (flanges vertical). Align reels flange to flange and, if possible, arrange so that first in is first out.		Multiple reels stacked on top of each other ("Pancake" storage) is not recommended for cable drums. The weight of the stack can total thousands of kgs. creating an enormous load on the bottom reel. Also, damage to the reel and/or cable will likely occur when the reel is flipped for transit. A concentration of stress on the reel flange may cause it to break and subsequently damage the cable.
	When using a hoist, install a mandrel through the reel arbor holes and attach a sling. Use a spreader bar approximately 6 inches longer than the overall reel width placed between the sling ends just above the reel flanges.		This may lead to the bending of the reel flanges and mashing the cable

C. PRE- INSTALLATION

To ensure safety during cable installation, following shall be checked prior to installation.

1. The cable selected is proper for designed application.
2. The cable has not been damaged in transit or storage.

Review all applicable state and national codes to verify that the cable chosen is appropriate for the job. Also consult your local electricity authority. Next, you must identify any existing cable damage and prevent any further damaged from occurring. This is done through proper cable inspection, handling and storage.

D. INSTALLATION & LAYING

Mechanical stresses during installation are generally more severe than those encountered while in service. Thus care should be taken as regards to the following while installation and laying of cables.

1. Polycab recommend the laying and installation of cables as per IS: 1255/84.
2. Care shall be taken during laying to avoid sharp bending, and twisting.
3. Cable shall be un wound from the drum by lifting the drum on the center
4. Shaft supported both ends with suitable jacks / stands.
5. Under no circumstances the cable winding shall be lifted off a coil or drum lying flat at the flanges. This would cause serious twist and damages.
6. Suitable protection shall be provided to the cables against mechanical damages, it includes covers, pipes etc.

E. RECOMMENDED MINIMUM BENDING RADIUS FOR HEAVY DUTY CABLES.

Single Core : 20 x D

Multicore : 15 x D

Where D= Diameter of cable in mm

F. RECOMMENDED SAFE PULLING FORCE WITH STOCKINGS:

a) For Unarmoured Cable: $P = 5 D^2$

Where P= Pulling Force

b) For Armoured Cable : $P = 9 D^2$

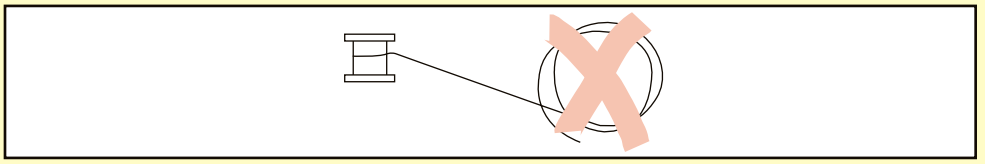
Where D= Diameter of cable in mm

G. RECOMMENDED SAFE PULLING FORCE WHEN PULLED WITH PULLING EYE :

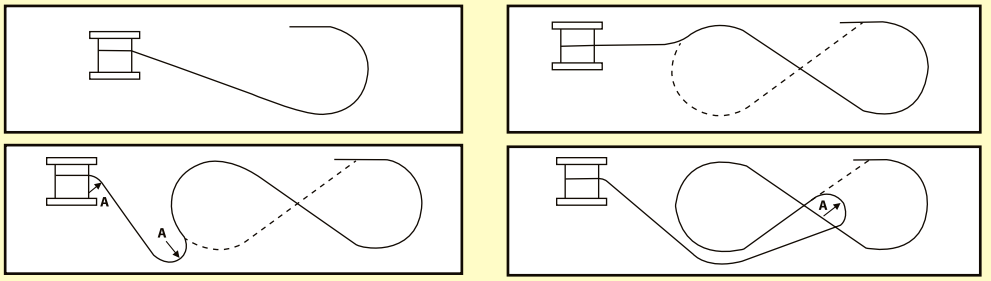
a) For Aluminium Conductors : 30 N/mm^2

b) For Copper Conductor : 50 N/mm^2

DO NOT ATTEMPT "COILING" OF CABLE ON THE GROUND



ON THE GROUND CABLE CAN BE FLAKED IN A FIGURE OF EIGHT FORMATION



Note: R Minimum Permissible bending radius of cable.

IMPORTANT FORMULAE * TO CALCULATE VARIOUS ELECTRICAL PARAMETERS OF CABLES

1) Inductance :

$$L = K + 0.2 \log_e \left(\frac{2S}{d}\right) \text{ (mH/km)}$$

where K = Constant for different stranded conductors
S = Axial Spacing between Cables & Conductors in mm.
d = Conductor Diameter

No. of wires in Conductor	K
7	0.0642
19	0.0554
37	0.0528
61	0.0514
Above 61	0.0500

2) Reactance :

$$X = 2\pi f \times L \times 10^{-3} \Omega / km$$

where f = frequency
L = Inductance

3) Impedance :

$$Z = (R^2 + X^2)^{1/2} \Omega / km$$

where R = A.C Resistance at operating temperature Ω / km
X = Reactance

4) Charging Current :

$$A = Uo \times 2\pi \times f \times C \times 10^{-6} \quad \Omega / km$$

5) Voltage Drop :

For 3 Core Cables : $\sqrt{3} \times Z$ V/A/Mtr
For 1 Core Cables : $2 \times Z$

where Z = Impedance

6) Capacitance:

$$C = \frac{Er}{18 \log_e (D/d)} \text{ (μf / km)}$$

where Er = Relative Permitivity for XLPE : 2.3
D = Dia over Insulation in mm
d = Dia over conductor in mm

7) Dielectric loss in watts per km/phase:

$$2\pi f \times C\, Uo^2 \tan\delta\, 10^{-6} \text{ (watt / km per phase)}$$

where C = Capacitance
Uo = Power frequency voltage between conductor & earth
Tanδ = Dielectric power factor
= 0.0003 for XLPE

8) Voltage Induced in Sheath :

$$E_S = IXm$$

where I = conductor current (A)
Xm = $2\pi fM \times 10^{-3}$ (Ω / km)
M = $0.2 \log_e \frac{2S}{dm}$ (mH/km)
S = Distance between Cable Centres, dm
= Mean Diameter of Sheath

9) Short Circuit Rating:

$$I^2 = \frac{K^2 S^2}{T} \log_e \left(\frac{\theta_1 + \beta}{\theta_0 + \beta}\right)$$

where I = Short circuit (R.M.S over duration) in Amps.
T = Duration of short circuit in second
K = Constant – 226 for Copper, 148 for Aluminium, 78 for Steel
S = Area of Conductor in mm^2
θ_1 = Final Temperature of Conductor or Armour
θ_0 = Initial Temperature of Conductor or Armour
β = Reciprocal of the temperature coefficient of resistance of the conductor per° C at 0° C (228 for Aluminium, 202 for Steel, & 234.5 for Copper)

* source BICC handbook

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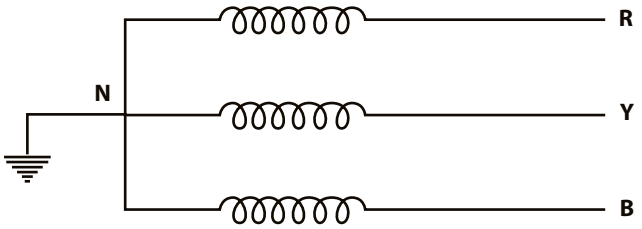
EARTHED SYSTEM:

In the initial years, the generators and transformers were having capacities of few MVA and hence fault current was also less. The star point or neutral point was solidly grounded and this is called earthed system.

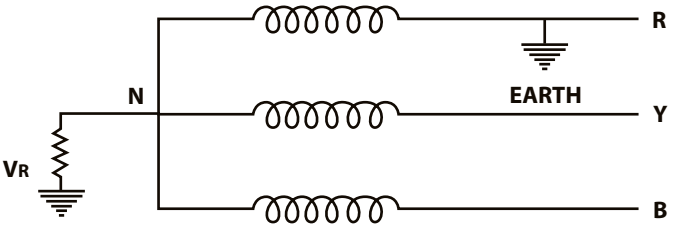


In this system if an earth fault occurs on any of the phases, the voltages of other two healthy phases with respect to the earth remain the same.

UNEARTHED SYSTEM:

Today generators of 500 MVA capacity are in commercial use. More over several mega power stations are connected to grid. Due to this, the fault level has increased tremendously. In case of an earth fault, a heavy current flows in to the fault and this may damage the costly generators and power transformers.

To reduce the fault current, the star point is connected to the earth through a resistance or a reactance as under:



In this case if an earth fault occurs on R phase, the voltage of the faulty phase with respect to the earth (R) appears across the current limiting resistance or reactance in the earth circuit of the star point and as a result the voltage of the star point which was at earth potential under normal conditions rises to VR. Due to this the voltages of other two healthy phases (B and Y) with respect to the earth rises by 1.7 times (Vector sum of VR and VB). If the insulation of these phases are not designed for these increased voltages they may develop earth fault. This is called Unearthed System.

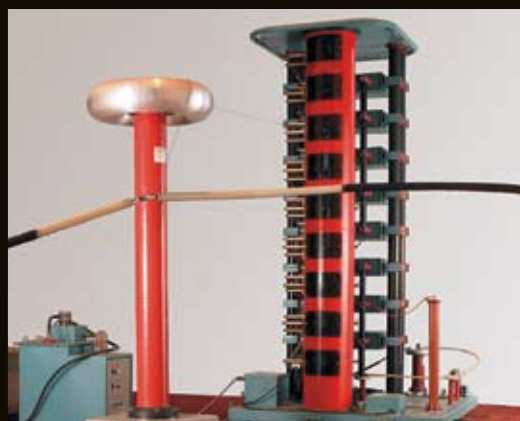





Production Facilities at Daman Factory





Wiring the World

POLYCAB®
WIRES & CABLES

POLYCAB WIRES PVT. LTD.

(an ISO 9001:2000 Company)

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POLYCAB WIRES PVT LTD

TECHNICAL DETAILS

HT XLPE CABLES

UPTO 132Kv

C O N T E N T S

POLYCAB CCV - LINES FOR XLPE CABLE

INTRODUCTION

Polycab - Experience & Trust:

Polycab is the fastest growing cable manufacturer in India. "Polycab" has earned trust and confidence of customers over 3 decades of performance.

Today being leader in India and South East Asia, Polycab manufactures Electrical Power and communication cables. Strategic control over basic raw materials and wide range of cables from 1.1 kV to 132 kV has given an edge and ensured phenomenal growth.

Million lengths of cables manufactured by Polycab in different voltage grades are in operation for years.

Inspired by customer support, Polycab has enhanced the manufacturing ability with 66 kV and 132 kV production facilities.

66 KV & 132 KV XLPE CABLES

Cables for transmission of Power at 66 KV and 132 KV are used in Power Plants, and distribution systems of utilities and Industries consuming bulk power. Where overhead lines are not suitable due to densely built areas and buildings in cities, the use of these cables have become inevitable.

The cables are designed to be used underground directly, buried in ducts, trenches or in tunnels.

Polycab cables are successfully type tested as per IEC 60840 and IS:7098 Part 3 for all critical electrical, Mechanical, thermal and installation parameters, ensuring the quality and reliability.

MANUFACTURING PROCESS

Polycab 132 & 66 KV cables are manufactured on the most modern and state of the art Dry-curing CCV (continuous Catenary Vulcanization) XLPE Insulation Line. True Triple Extrusion, Dust free environment and On-Line Thickness measurement and control are the highlights of manufacturing process which ensures consistency in quality standards.

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XLPE CABLES

XLPE insulated cables are increasingly replacing conventional oil-filled paper insulated cables for higher service voltage up to 220 kV. Also EHV cable up to 500 kV are being manufactured with XLPE insulation and slowly replacing oil filled cables.

As experienced over twenty years, the XLPE EHV cable links showed no fundamental failures, such as, internal breakdowns or premature ageing. Actually these cables have surpassed the performance of oil filled paper insulated cables in many areas for their long term reliability under all kinds of practical service conditions.

The advantages for the substitution of XLPE cables as compared to oil filled cables are as:

(1) XLPE cables have extremely low dielectric losses and are therefore economical in use.

(2) XLPE cables – properly designed, manufactured and installed – are reliable and have a long service life expectancy.

(3) XLPE cables are lighter and easier to handle, thus reducing the installation costs.

(4) Jointing and terminations are easier with XLPE cables.

(5) XLPE cables do not contain oil and are therefore pro-environmental.

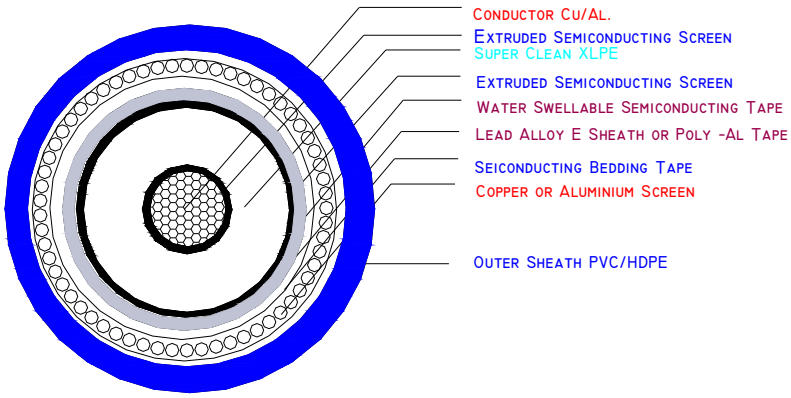
(6) XLPE cables require lesser maintenance.

In fact certain countries have stopped using oil filled cable due to pollution aspects.

Out of various process being used today, Polycab manufactures EHV Cables with a dry cure/dry cool technology with Scholz, Germany and Royal U.S.A. manufacturing lines.

The important feature of this technology are discussed in the following pages in detail.

SCHEMATIC DIAGRAM OF TYPICAL POLYCAB EHV- CABLES FROM 66 TO 132 KV



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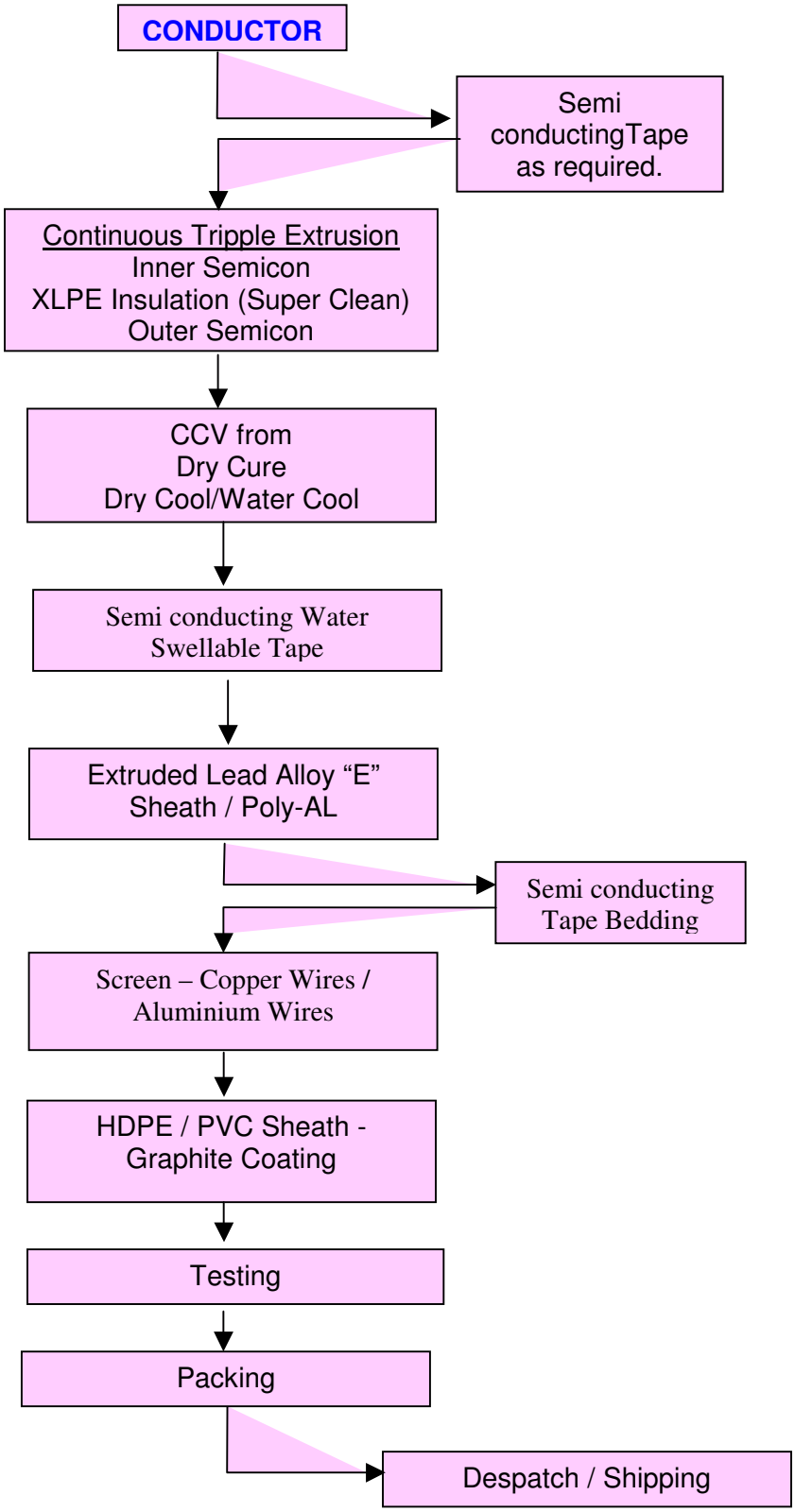
WIRES & CABLES

PROCESS FLOW DIAGRAM OF XLPE CABLES FOR 66 & 132 KV



POLYCAB
WIRES & CABLES

MATERIAL HANDLING & ENVIRONMENT CONTROL

MANUFACTURING PROCESS HIGHLIGHTS

Super Clean grades of insulating material consisting basically of high purity polyethylene with a cross-linkable structure especially developed for the manufacturing of high voltage cables are used. The compound meets the stringent requirement of cleanliness. The suppliers are selected from the leading manufacturers of XLPE material in the world.

Also the semi-conductive material is selected based on its compatibility with insulation and having uniform surface smoothness and excellent extrusion properties.

A contamination free insulation is essential when demanding a long lifetime under high electrical stress.

Therefore the material transportation system includes clean air washing of all materials delivery containers, feeding of insulating and semiconducting compounds to the clean rooms having buffers, and finally supplying to hopper dryers in closed stainless steel pipes, ensuring the followings:

- Minimum personal contact with material.
- Prevention of contamination entering into the insulation or semi conducting material.
- Removes materials fins if any associated with the material conveying.

The entire insulation process is performed in clean room condition and positive pressure to maintain conducive environment.

XLPE CONTAINER TRANSPORTATION TO MANUFACTURING LINES

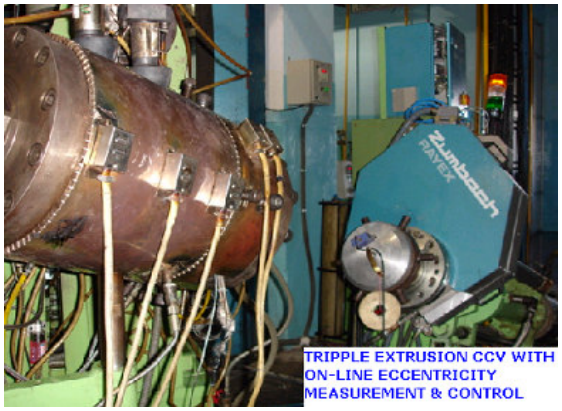
QUALITY PLANNING AND PROCESS OF PRODUCTION

In extra high voltage application, there are three polymeric layers over the conductor. The first layer comprises of a conductor screen, (semi conducting compound and semi conducting tape – optional), the XLPE insulation (Super Smooth Clean Grade of XLPE Compound) and an insulation screen. The protective layers consisting of the bedding, a copper wire screen or tape screen, metallic (lead sheath) or non-metallic Poly Al. Sheath outer PVC/HDPE sheath.

PROCESS

(a) **Conductor:** The conductor is made form high purity Copper or Aluminium rods. These rods are drawn to specific diameter wire with excellent smoothness, cylindercity and online annealing. These wires are then compacted to required size conductor with very good compactness & smoothness. The conductors are measured online for conductor resistance by Asea Cartelloid, (Switzerland) online instrument conductor meets Standard IEC-60228, IS:8130.

(b) **XLPE Insulation (Continuous Tripple Extrusion & Continuous Catenary Vulcanization):** The insulation process is the most critical phase of the manufacturing chain, as the insulation layer of a high voltage or extra high voltage cable is under high electrical stress and it has to be free from defects.



TRIPPLE EXTRUSION CCV WITH ON-LINE ECCENTRICITY MEASUREMENT & CONTROL

During extrusion, the compound are handled with due care reducing possibility of contamination and fed directly to the hopper of extruders. The temperature profile of all three extruders & the head is controlled by computers with in an accuracy of ± 1°C. All requirements are preprogrammed. The triple crosshead and all extruders are from Royal, USA, ensuring uniform layers of semi-conducting and insulation. Insulated conductor dimension such as diameter, thickness of each layer and eccentricity is controlled by online x-ray monitoring equipment from Zumbach, Germany, to ensure the consistency.

ON-LINE ECCENTRICITY MEASUREMENT

Continous Catenary Vulcanization : The insulated conductor then enters a heated vucanization zone located within a tube of 200 mm diameter and 140 mtrs. long, in "Catenany" form. The heating is done using inert & dry pressurized (10-12 bar) Nitrogen gas to minimize voids and moisture content.

Also the hot dry nitrogen sweeps away all volatiles such as peroxides, acetophenone, methane, methylstyrene, ethane and water vapours. The M/C is equipped with auto centering device and also fixed with X'Ray machinery equipped from Zumbatch, Germany for Tripple Extrusion. The dry cool zone of this Catenary tube of CCV line provides stress relaxation in the core particularly the innermost layer of the insulation, in addition to the cooling of the insulated conductor.

The complete CCV line is automated with programming system and ensures achievement of required parameters.

(c) **Taping**: Semi-conducting Water Blocking or water swellable tape of superior quality are applied on the insulated conductor. This being done on double helical tape dispenser machines with synchronized payoffs and take ups.

(d) **Extruded Lead Alloy 'E' Sheathing**:

Introduction: Basic purpose of lead sheathing is to protect the core and prevent moisture reaching the insulation during service.

The inherent inertness and excellent corrosion resistance of lead and moisture repellent nature made it an obvious choice for underground cables. Continuous Lead extruders are used for this process.

Process: Lead Ingot of 99.98% min. purity is used and melted in the melting pot of 10 tons capacity at approx. 370°C also added master batch to bring right metallurgy to make lead alloy 'E', which yields to good extrusion, softwares, smoothness and pliability in lead sheathing.

After melting the lead is transported by a gravity feed pipe (in special omega shape to handle heat stresses) to the vertical screw housing at the bottom and the rotating screw transports the lead alloy up to the die block, with water cooling system to control the plasticity of the lead. From cross head die block lead alloy is forced to form the tube. The computerized system controls the output and dimensions of the lead alloy, to required thickness.

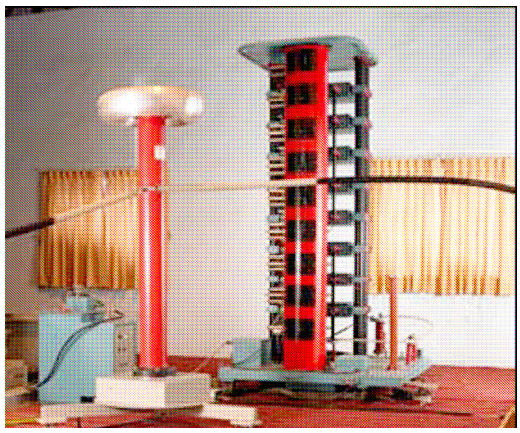
1. **Taping** : Semi Conducting Cotton Tape are helically wound on the core as bedding.
2. **Copper Screening & Taping** : The metallic part of the screening consists of copper wires /copper tape (s) helically applied over the lead alloy sheath bedding. Screening is normally selected – based on the fault current requirement.
3. **Sheathing with graphite coating**: Sheathing is either of PVC or of Black Polyethylene.

QUALITY ASSURANCE AND TESTING

4. **Testing** : All cable drums are tested for High voltage test, partial discharge and Conductor Resistance, as per IS:7098 Part 3 or IEC 60840. Online inspection is carried by stagewise physical inspection and measurement of thickness, diameter, voids and eccentricity and hot set test. The verification of cable is done with detailed cable engineering Data sheets.

Quality Assurance Testing: Polycab EHV Cables are tested to ensure high reliability in performance. Continuous process monitoring and post manufacturing tests to ensure the compliance to Indian and International Standards.

Polycab is self sufficient to carry out all Routine, Type & Special Tests in the laboratory. It has world class Testing facilities for Routine & Type Tests.



IMPULSE GENERATOR

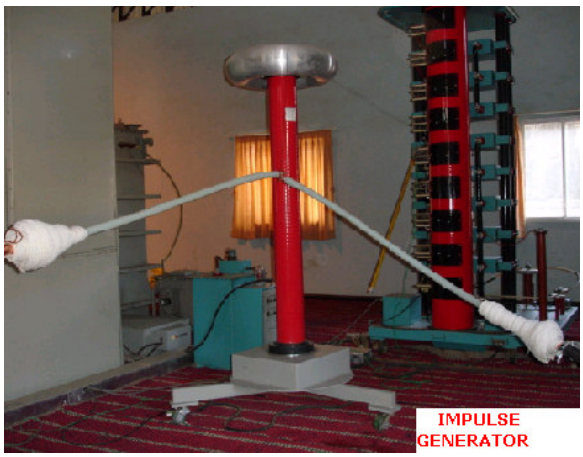
(A) **Routine Tests:**

- Partial Discharge Test
- High Voltage Test
- Conductor Resistance Test.

Routine Tests are performed on each manufactured length of cable in Routine Test Laboratory.

COMPUTERISED PARTIAL DISCHARGE DETECTOR

ROUTINE TEST ENCLOSURE



Type Tests: Type Test is performed on a representative sample.

i) **Electrical**: All electrical type tests as per IEC 60840 or IS:7098 Part 3 are carried out on the cable samples.

ii) **Non-Electrical**: All non- electrical type tests as per IEC 60840 or IS:7098 Part 3 are carried out on the cable samples.

BASIC DESIGN OF 66 & 132 KV CABLES

Polycab 66 & 132 KV XLPE Cables are designed to meet requirement of customer and those set in national and international standards mainly Indian Standard IS-7098 Part 3 and IEC 60840.

Polycab has established system of Quality Management which complies ISO 9001 requirements and ensures customer needs and expectations.

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WIRES & CABLES

APPLICABLE STANDARDS FOR XLPE CABLES 66 KV & 132 KV

The cable systems described in this publication generally conform, where appropriate, to the following standards:

1. IS Standards 7098 Part 3 — Cross-Linked Polyethylene Insulated Thermoplastic Sheathed Cables - Specification. Part - 3 for working voltages from 66 Kv up to and including 220 kV.
2. IEC Publication 60228 — Conductors of Insulated Cables.
3. IEC Publication 60502 — Extruded Solid Dielectric Insulated Power Cables for Rated Voltages from 1 kV to 30 kV.
4. IEC 60840 — Power cables with extruded insulation and their accessories for rated voltages above 30 kV (Um = 36 kV) up to 150 kV (Um = 170 kV) - Test methods and requirements
5. IEC – 60287 — Electric Cables calculation of current rating.
6. IEC- 60332 — Tests on Electric cables under fire conditions.

Test Requirement of 66 & 132 kV Cables as per IEC 60840 and IS:7098 Part 3

No.	Description of the Test	Type Designation			
		Routine	Special	Elect.	Non-Elect.
1	Partial Discharge Test	X		X	
2	Voltage Test	X		X	
3	Electrical test on non-metallic sheath (if required)	X			
4	Conductor examination		X		X
5	Measurement of electrical resistance of conductor	X	X		
6	Measurement of thickness of insulation and non-metallic sheaths		X		X
7	Measurement of thickness of metallic sheaths		X		X
8	Measurement of diameters (if required)		X		
9	Hot set test for XLPE Insulation		X		X
10	Measurement of capacitance		X		
11	Check on insulation thickness of cable for electrical type tests				X
12	Bending test followed by partial discharge test				
13	Tangent Delta Measurement				
14	Heating Cycle voltage test, followed by partial discharge test				
15	Impulse withstand test followed by a power frequency voltage test				
16	Resistivity of semi-conducting layers.				
17	Determining the mechanical properties of insulation before and after ageing.				X
18	Determining the mechanical properties of non-metallic sheath before and after ageing.				X
19	Ageing tests on pieces of complete cable				X
20	Loss of mass test on PVC Sheath				X
21	Pressure test at high temperature on sheaths				X
22	Tests on PVC Sheaths at low temperature				X
23	Heat shock test for PVC Sheaths				X
24	Carbon black content of PE Sheaths				X
25	Shrinkage test for XLPE Insulation				X
26	Test under fire conditions (if required)				X
27	Water penetration test.				X

POLYCAB WIRES & CABLES

TECHNICAL DATA

66 kV

Polycab 66 KV, Single Core XLPE Cable with Copper / Aluminium Conductor,Screened, XLPE Insulation, Lead alloy "E" Sheathed and Copper Screened with PVC / PE Sheath

Nominal Cross Section of Conductor	Conductor Diameter (approx.)	XLPE Insulation Thickness (Nominal)	Lead Sheath Thickness	Copper Screen Area	PVC/PE Sheath Thickness (Nominal)	Overall Dia of Cable	Weight of COPPER Cable (Approx.)	Weight of ALUMINIUM Cable (Approx.)
Sq.mm	mm	mm	mm	Sq.mm	mm	mm	kg/km	kg/km
185	16.5	11	2.0	70	2.8	60	8850	7000
240	18.5	11	2.0	95	3.0	63	9700	8260
300	20.5	11	2.0	95	3.0	66	10900	9000
400	23.0	11	2.1	95	3.2	69	11400	9850
500	27.0	11	2.2	95	3.2	73	13000	10000
630	30.0	11	2.2	95	3.4	76	14900	11000
1000	39.5	11	2.4	95	3.6	85	18600	12500

66 kV

Polycab 66 KV, Single Core XLPE Cable with Copper / Aluminium Conductor, Screened, XLPE Insulation, Poly Al. Sheathed and Copper Screened with PVC / PE Sheath

Nominal Cross Section of Conductor	Conductor Diameter (approx.)	XLPE Insulation Thickness (Nominal)	Copper Screen Area	PVC/PE Sheath Thickness	Overall Dia of Cable	Weight of COPPER Cable (Approx.)	Weight of ALUMINIUM Cable (Approx.)
Sq.mm	mm	mm	Sq.mm	mm	mm	kg/km	kg/km
185	16.5	11	70	2.8	39	5900	4850
240	18.5	11	95	2.8	51	6700	5150
300	20.5	11	95	3.0	64	7250	5500
400	23.0	11	95	3.0	66	8250	5800
500	27.0	11	95	3.2	71	9450	6500
630	30.0	11	95	3.2	74	10800	7000
1000	37.5	11	95	3.6	83	14700	8400

ELECTRICAL DATA

66 kV 1 CORE XLPE CABLES

Size	Conductor Resistance Ohm/KM				Short Circuit Capacity of Conductor. kA / Sec.		Capacitance (Approx.)	Inductance Trefoil form	Charging Current - Rated Voltage
	At 20°C		At 90°C						
Sq.mm	Cu.	Al.	Cu.	Al.	Cu.	Al.	uF / km.	mH / km.	Amps/km.
185	0.0991	0.164	0.1272	0.210	26.5	17.6	0.17	0.45	2.0
240	0.0754	0.125	0.0973	0.161	34.5	22.7	0.18	0.43	2.2
300	0.0601	0.10	0.0781	0.129	42.9	28.3	0.20	0.42	2.4
400	0.0470	0.0778	0.0619	0.1010	57.2	37.8	0.22	0.40	2.6
500	0.0366	0.0605	0.0493	0.0792	71.5	47.2	0.24	0.38	2.9
630	0.0283	0.0469	0.0395	0.0623	90.1	59.5	0.26	0.37	3.1
1000	0.0176	0.0291	0.0276	0.0410	143	94.5	0.31	0.35	3.7

POLYCAB
WIRES & CABLES

TECHNICAL DATA

132 kV Polycab 132 KV, Single Core XLPE Cable with Copper / Aluminium Conductor, Screened, XLPE Insulation, Lead alloy "E" sheathed and Copper Screened with PVC / PE Sheath

Nominal Cross Section of Conductor	Conductor Diameter (approx.)	XLPE Insulation Thickness (Nominal)	Lead Sheath Thickness	PVC / HDPE Outer Sheath thickness	Copper Screen Area	Overall Dia of Cable	Weight of COPPER Cable (Approx.)	Weight of ALUMINIUM Cable (Approx.)
Sq.mm	mm	mm	mm	mm	Sq.mm	mm	kg/km	kg/km
240	18.4	18	2.3	3.3	95	74	12300	10800
300	20.5	18	2.3	3.4	95	76	13400	11550
400	23.0	18	2.4	3.5	95	78	15600	13100
500	27.0	18	2.4	3.6	95	84	16800	12350
630	30.0	18	2.5	3.8	95	86	18500	14600

ELECTRICAL DATA

132 kV 1 CORE XLPE CABLES

Size	Conductor Resistance Ohm/KM				Short Circuit Capacity of Conductor. kA / Sec.		Capacitance (Approx.)	Inductance	Charging Current - Rated Voltage
	At 20°C		At 90°C						
Sq.mm	Cu.	Al.	Cu.	Al.	Cu.	Al.	uF / km.	mH / km.	Amps/km.
240	0.0754	0.125	0.0973	0.161	34.5	22.7	0.12	0.48	2.87
300	0.0601	0.10	0.0781	0.129	42.9	28.3	0.13	0.46	3.10
400	0.0470	0.0778	0.0619	0.1010	57.2	37.8	0.14	0.45	3.35
500	0.0366	0.0605	0.0493	0.0792	71.5	47.2	0.16	0.43	3.82
630	0.0283	0.0469	0.0395	0.0623	90.1	59.5	0.17	0.41	4.0
1000	0.0176	0.0291	0.0276	0.0410	143	94.5	0.21	0.37	5.0

CABLE HANDLING

(Pre-Installation)

OVERVIEW

To ensure safety during cable installation and reliability once the cable is installed, user should confirm the following prior to installation.

- The cable selected is proper for designed application.
- The cable has not been damaged in transit or storage.

Review all applicable state and national codes to verify that the cable chosen is appropriate for the job. Also, consult your local electricity authority / consultant.

Next, you must identify any existing cable damage and prevent any further damage from occurring. This is done through proper cable inspection, handling and storage.

CABLE INSPECTION

Inspect every cable reel for damage before accepting the shipment. Be particularly alert for cable damage if:

- A reel is laying flat on its side
- Several reels are stacked
- Other freight is stacked on a reel
- Nails have been driven into reel flanges to secure shipping blocks
- A reel flange is damaged
- A cable covering is removed, stained or damaged
- A cable end seal is removed or damaged A reel has been dropped (hidden damage likely)

CABLE HANDLING

Remove all nails and staples from the reel flanges before moving a reel, and avoid all objects that could crush, damage or impact the cable when moving. NEVER use the cable as a means to move a reel.

When unreeling, observe recommended bending radii, use swivels to prevent twisting and avoid overruns.

STORAGE:

In general, the requirements for cable storage are quite straight forward. Maintain the cable dry, at a temperature that will not cause degradation, and protect the cable from damage.

In order to maintain cable dryness, it is mandatory that the following steps be taken:

1. Maintain cable and end cap moisture seal integrity.
2. Do not store in locations where standing water is likely.
3. Maintain cable ends fixed to reel flanges without puncturing jackets of end caps.

In order to keep the cable from degrading and ready for use, it is necessary to:

1. Maintain, as far as practicable, a covering over the cable on the reel.
2. Maintain storage temperatures above 5°C. Storing below 5°C for long period can cause damage to sheath. Consult cable manufacturer in such events.
3. It is recommended to avoid stored cables immediately prior to installation in direct sunlight when ambient temperatures are in excess of 122°F or 55°C. Some jackets will soften and this may lead to physical damage during installation.
4. When cable is stored at temperatures below 0°C, it is necessary to move the reel(s) into a heated area before installation, maintained at a minimum temperature above 5°C. The cable must reside in this heated area for at least 8 hours before it is installed.

In order to protect the cable from damage, it is necessary to:

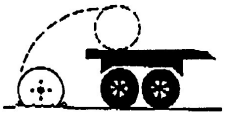
1. Store cable, especially long-term storage, in relatively inactive areas.
2. Maintain a covering on the cable reels to avoid cable sheath damage.
3. In areas of extreme rodent infestation, cables should be protected with full lagging, steel plates over flange penetrations or other suitable means.

Store cable reels standing on flange rims. DO NOT, except in special circumstances, store cable reels on their sides; i.e., lying on one or the other flange.

POLYCAB®
WIRES & CABLES

RECOMMENDED CABLE HANDLING PROCEDURES

Wire and Cable Reel Handling and Storage



DON'T

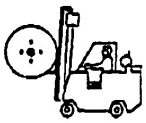
When off loading reels from a truck, lower reels carefully using a hydraulic gate, hoist or forklift truck. Never drop reels. If reels must be rolled, roll in opposite direction of the cable wraps to keep cable from loosening on the reel.

When using a hoist, install a mandrel through the reel arbor holes and attach a sling. Use a spreader bar approximately 6 inches longer than the overall reel width placed between the sling ends just above the reel flanges. This will prevent bending the reel flanges and mashing the cable

DO

DON'T

DO

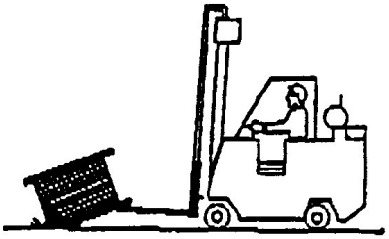


DON'T

If a fork lift is used, approach the reel from the flange side. Position the forks such that the reel is lifted by *both* reel flanges. *Do not allow the lift forks to contact the cable.* Care must be taken by the fork lift operator not to make sudden turns or stops.

When selecting a storage site, consideration should be given to:

- Traffic patterns during off-loading
- Grade and condition of the soil or pavement
- Protection from vehicle damage during the time in storage
- Environmental conditions such as exposure to heat, corrosive chemicals, etc.



DON'T

Cable reels should be stored on hard surfaces resting on the flanges edge (flanges vertical). Align reels flange to flange and, if possible, arrange so that first in is first out. Multiple reels stacked on top of each other ("Pancake" storage), or storing reels flat (flanges horizontal) is not recommended for bare conductor or medium voltage cable. The weight of the stack can total thousands of kgs. creating an enormous load on the bottom reel. Also, damage to the reel and/or cable will likely occur when the reel is flipped for transit. A concentration of stress on the reel flange may cause it to break and subsequently damage the cable.

CURRENT RATINGS

66 kV COPPER XLPE CABLES WITH LEAD SHEATH

Size of Cable	Reactance		Continuous Current Rating in Ground		Continuous Current Rating in Air	
	Trefoil	Flat	Trefoil	Flat	Trefoil	Flat
185	0.137	0.215	360	370	520	570
240	0.131	0.205	410	430	605	670
300	0.126	0.198	460	485	690	765
400	0.122	0.190	515	550	860	885
500	0.118	0.182	580	625	910	1020
630	0.112	0.173	645	705	1025	1175

66 kV ALUMINIUM XLPE CABLES WITH LEAD SHEATH

Size of Cable	Reactance		Continuous Current Rating in Ground		Continuous Current Rating in Air	
	Trefoil	Flat	Trefoil	Flat	Trefoil	Flat
185	0.137	0.215	280	292	400	465
240	0.131	0.205	320	337	470	520
300	0.126	0.198	355	379	532	590
400	0.122	0.190	412	430	625	695
500	0.118	0.182	465	493	724	805
630	0.112	0.173	520	562	830	940

Current Ratings are based on the following conditions:

a) Single point bonding / cross bonding.
b) Ground temperature : 30°C.
c) Max. Conductor temperature : 90°C
d) Ambient Air Temperature : 40°C
e) Depth of laying : 150 cm.

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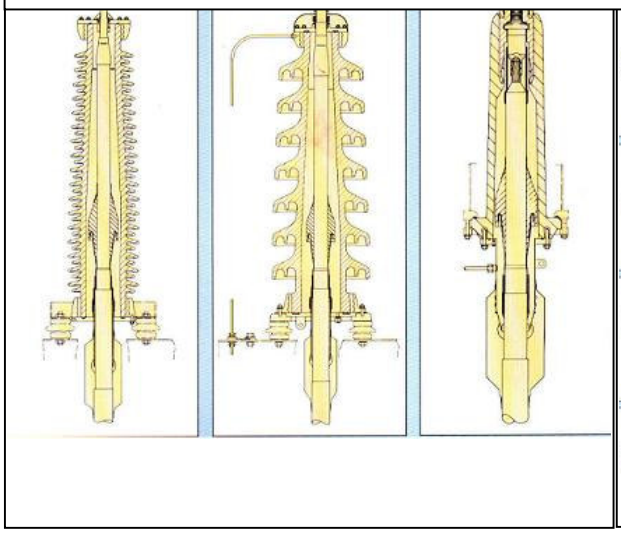
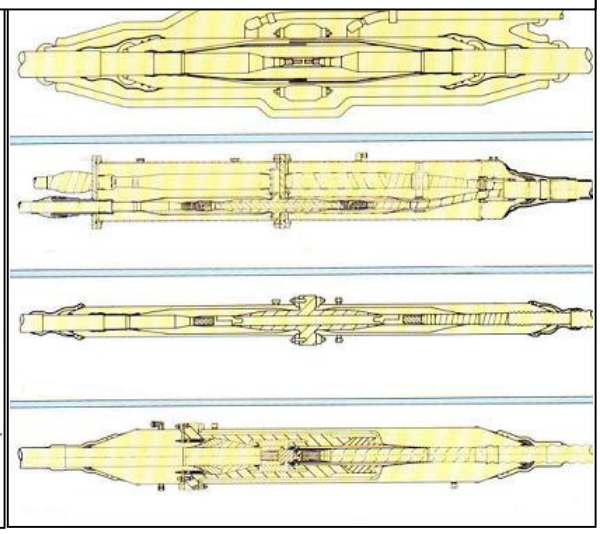
66 & 132 kV XLPE CABLES ACCESSORIES, JOINTING, TERMINATIONS AND INSTALLATION

Accessories are the integral part of power transmissions through cables. The design concept of XLPE cable must take into consideration the demands of such application.

Polycab can source out a full range of accessories to cover all types of jointing requirements and terminations. These accessories meet all international standards and have proven reliability for many years of operation.

Jointing





TERMINATION **STRAIGHT THROUGH JOINT**

RATING FACTORS

Rating Factors for Variation in Ambient Temperature (Air/Ground) (Max. Conductor Temperature 90°C)

Temperature °C	15	20	25	30	35	40	45	50	55	60
Rating Factor in Air	1.25	1.20	1.16	1.11	1.05	1.00	0.94	0.88	0.82	0.76
Rating Factor in Ground	1.12	1.08	1.04	1.00	0.96	0.91	0.87	0.82	- -	- -

Group Rating Factors for Groups of Cables in Ground Number of Circuits in Group

Distance between centres of circuits mm	1	2	3	4	5	6	7	8	9
100	1	0.75	0.64	0.60	0.53	0.50	0.50	0.48	0.45
200	1	0.80	0.70	0.60	0.60	0.57	0.56	0.53	0.52
400	1	0.83	0.75	0.70	0.68	0.65	0.64	0.63	0.62
600	1	0.86	0.80	0.75	0.75	0.70	0.71	0.70	0.70
800	1	0.88	0.85	0.80	0.80	0.77	0.76	0.75	0.74
2000	1	0.95	0.92	0.90	0.90	0.91	0.90	0.90	0.89

Rating Factor for Phase Spacing in Flat Formation

Phase Spacing (S) mm	D	D+70	200	250	300	350	400
Rating Factor	0.93	1.00	1.03	1.05	1.07	1.08	1.10

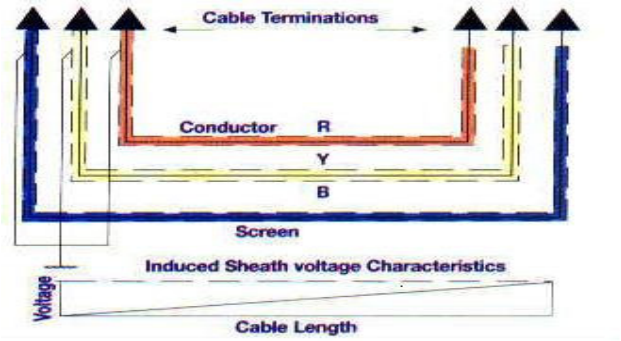
Rating Factor for Thermal Resistivity of Soil

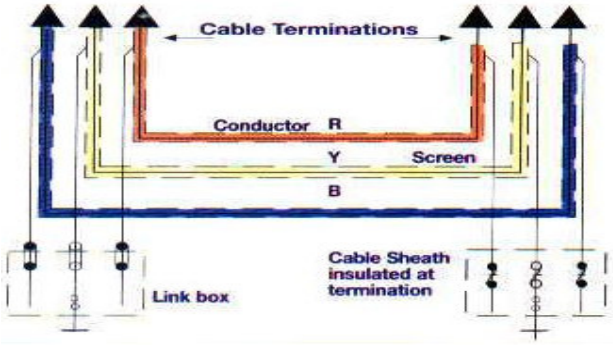
Soil Thermal Resistivity Deg. C.cm / Watt	70	100	120	150	200	250	300
Rating Factor	1.36	1.18	1.10	1.00	0.88	0.78	0.73

Rating Factor for Depth of Laying

Depth of laying - cm	90	100	120	150	160	170	180	190	200
Rating Factor	1.06	1.05	1.03	1.00	0.99	0.99	0.98	0.98	0.97

Electric potential are induced in cable sheath by electromagnetic induction. The permissible voltage rise has to be restricted to 60 volts are per P&T regulation to avoid interference with communication lines. Methods are available to reduce sheath voltages and currents and our recommendations for this system is given below:





METHODS:

Single Point Bonding

This is applicable for short cable circuit, such as interconnection with sub-stations or termination of an overhead line into a sub-station. In this system, the three sheaths are bonded and earthed at one of the cable route. Hence,

- A voltage will appear from sheath to earth which will be maximum at the farthest point from the earth bond at other end.
- No induced current hence, no sheath losses result.

The effects of Design Variation:

The tabulated data has been calculated carefully considering standard site conditions. However, the design changes can affect the cable characteristics, hence, the declared data is for guidance only and shall not be considered as guaranteed.

Mid Point Bonding:

This is a modification of the single point bonding method whereby the circuit is effectively split up into two elementary sections. By Mid Point Bonding, the length of the cable circuit can be increased to almost twice that of Single Point Bonded system. In this system, the three sheaths are bonded and earthed at the center of the cable route. As a result:

- Voltage will appear from sheath to earth which will be maximum at both ends of the cable route.
- No induced current, hence, no sheath losses result.

Both Ends Bonded:

This is applicable for long circuit lengths. In this system, the sheaths are bonded and earthed at both the ends of the cable. As a result of the flow of sheath currents sheath losses take place which slightly derates the current rating. This system has the following distinct advantages:

There is no sheath voltage to earth hence, ensures safety.

Installation is simple, and no maintenance or monitoring of the installation is necessary.

Cross Bonding:

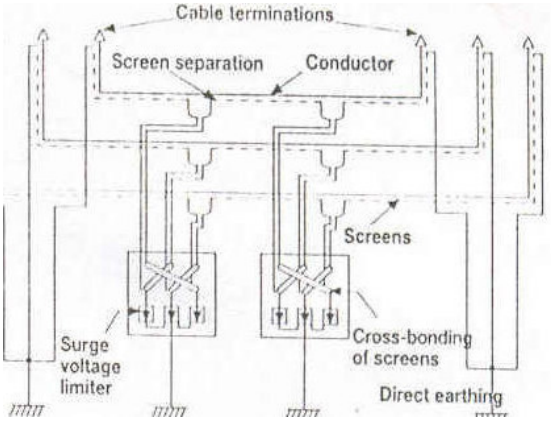
This is applicable for longer circuit. In this system, the sheaths of the adjoining cables are connected in a manner so as the sheaths are electrically 120^{o} apart.

Cross-bonding essentially consists of sectionalizing the sheaths into minor sections which are cross bonded. The minor sections together make a major section.

For cables in trefoil formation, their sheath voltage under the cross bonded system will be equal across a major section and have a phase displacement of 120^{o} (by ensuring the minor sections have identical lengths). The vector sum of the voltage will be zero. Hence, eliminating circulating current and sheath losses.

This system however have the following disadvantages:

- Complexity of the system
- Maintenance of the link boxes (prevention of water seepage to be ensured).
- Higher capital cost.

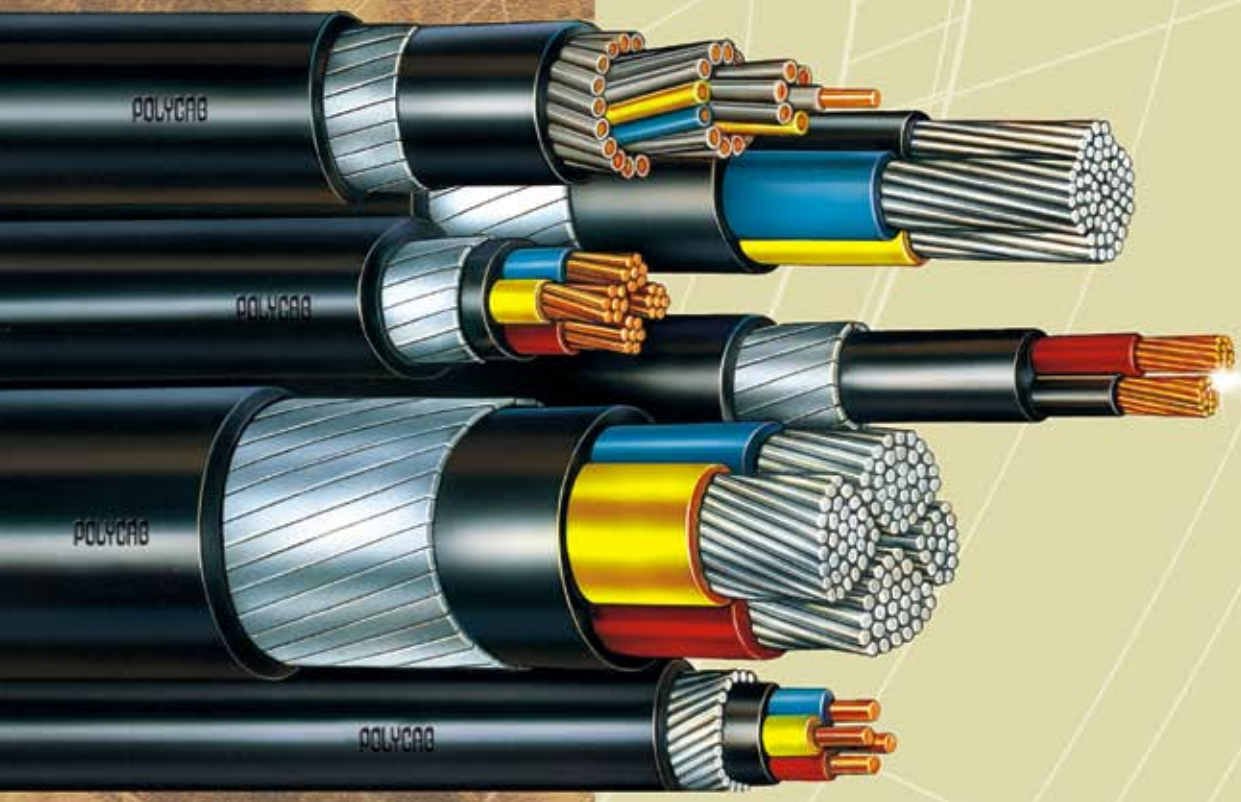


POLYCAB®

WIRES & CABLES

PVC INSULATED HEAVY DUTY CABLES

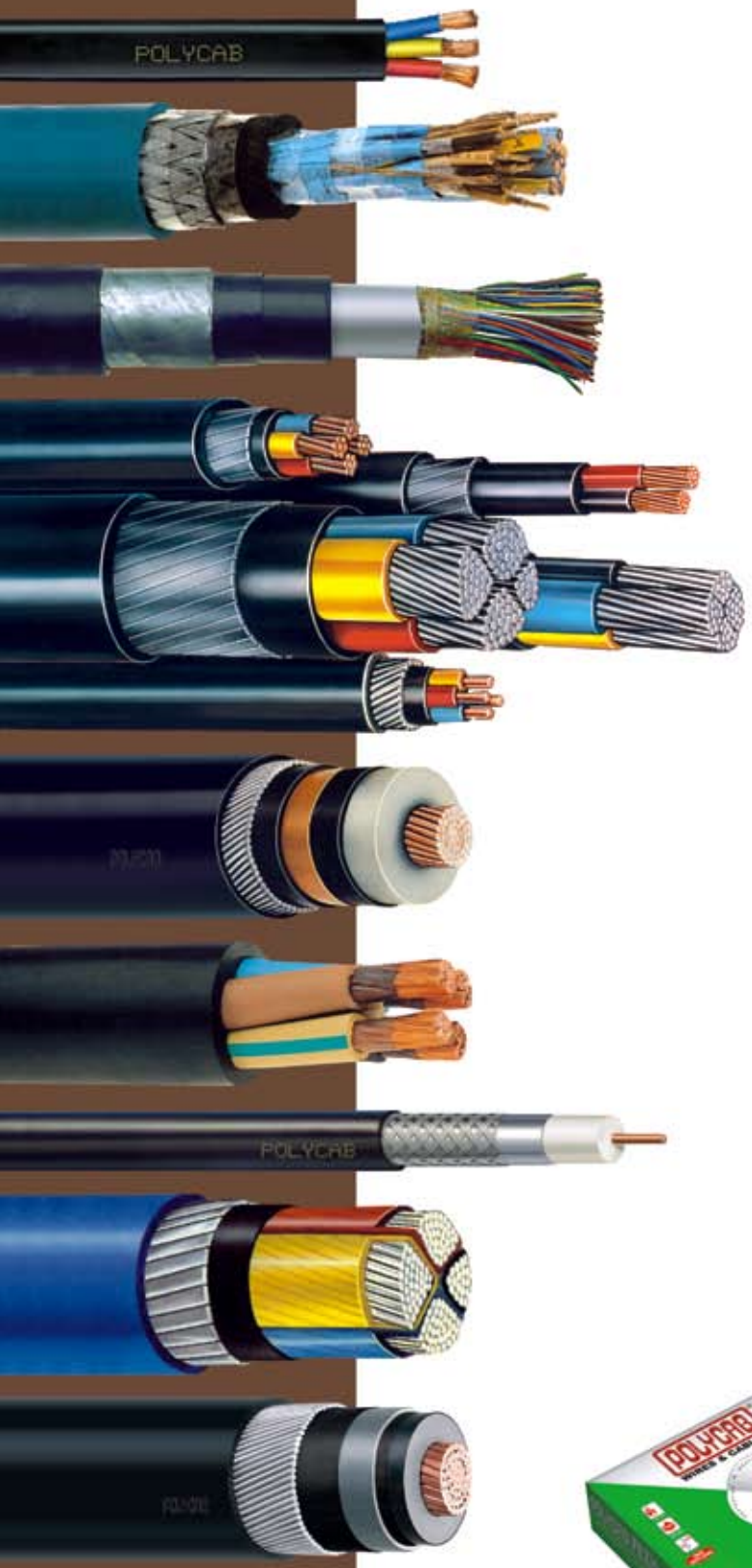
1100 V.



Details make the Difference

ISO 9001:2000

IS 1554 (Part I)



PRODUCT RANGE

- L.T. PVC & XLPE POWER CABLES WITH COPPER / ALUMINIUM CONDUCTOR (1100 V. UPTO 4 CORE X 630 SQ. MM., 1 CORE X 1000 SQ. MM.)
- L.T PVC & XLPE CONTROL CABLES (1100 V. UPTO 61 CORE X 1.5 & 2.5 SQ.MM.)
- H.T. XLPE CABLES UPTO 132 kV
- FIRE SURVIVAL, ZERO HALOGEN CABLES
- THERMO COUPLE COMPENSATING & EXTENSION CABLES
- INSTRUMENTATION CABLES SCREENED / UNSCREENED
- FRLS / FR / HR / HFFR / HOFR / RUBBER – POWER, CONTROL & INSTRUMENTATION CABLES
- HT / LT AERIAL BUNCHED CABLES
- RAILWAY SIGNALLING CABLES
- TELEPHONE CABLES – DRY & JELLY FILLED
- ACSR & AAAC CONDUCTORS
- MINING / WELDING – RUBBER CABLES
- EPR / SILICONE / HIGH TEMP. CABLES
- SUBMERSIBLE CABLES
- COAXIAL CABLES
- BUILDING WIRES & FLEXIBLES (SINGLE & MULTICORE)
- LAN CAT-5 / 5E, 6 CABLES
- PVC PIPES & ACCESSORIES
- INDUSTRIAL PLUGS & SOCKETS

Contents

POLYCAB WIRES & CABLES

AN ISO 9001:2000 COMPANY

THE COMPANY

POLYCAB, an ISO 9001: 2000 company is the largest Wire & Cable manufacturer in India with a proven track record of over three decades. The fastest growing company in the Indian Cable Industry with consistent growth of more then 40% per annum for the last 4 years. Polycab group has crossed Rs. 2000 crore turnover in the year 2006-07 and is set to achieve Rs. 3000 crore turnover in the year 2007 – 08.

From a modest beginning with Wires and Cables, over three decades ago Polycab set up State of Art manufacturing facilities at Daman in 1996.The last 3 decades have seen the core business develop along different product lines: - Low Voltage Cables, Medium Voltage Cables, Extra High Voltage Cables, Fire Survival & Fire Resistant Cables, Telecommunication Cables, Instrumentation Cables and Aerial Bunched Cables. In the manufacture of cables, a competitive edge lies not so much in product innovation as in providing consistent quality, guaranteeing reliability and ready availability. Polycab's Daman factory was created to address these key market determinants. The manufacturing set up is sourced out from the world renowned Machinery and Technology suppliers with constant upgradation and expansions.

CUSTOMER SATISFACTION

In an on going process to improve Customer Satisfaction Polycab offers a variety of services:

- Commercially competitive prices.
- Reliable & consistent quality.
- Reliable & just in time delivery.
- Product development for a changing market.
- A targeted stocking policy.
- Technical Support for Applications/ Projects

CUSTOMER FOCUSED

POLYCAB derives its strength from its customers. The growth of the latter is a prerequisite to the growth of the company and hence customers' satisfaction is its prime objective. Over the years sincere service and dedication to its Customers has earned the Company distinguished Customers which includes demanding leaders in Sectors like Utilities, Power Generation, Transmission & Distribution, Petroleum & Oil Refineries, Oem's, EPC contractors, Steel & Metal, Cement, Chemical, Atomic Energy, Nuclear Power, Consultants & Specifiers etc.

POLYCAB has highly experienced qualified and dedicated professionals with strong adherence to the quality management system. Polycab has offices all over the country and also has a wide network of authorized distributors and dealers to cater to all the customer segments in India and abroad.

POLYCAB has earned the trust and reputation in India and abroad by winning the customers' confidence. Several thousands kilometers of LT PVC Cables in the voltage range of 1.1KV have been manufactured and are in operation in India and abroad.

Polycab LT PVC Cables are preferred choice in Power Plants, Distribution Systems, Heavy Industries, Various Utilities, The Titans of Indian Industry & Consultants / Specifiers.

DETAILS MAKE THE DIFFERENCE

More than 3 decades of experience have enabled POLYCAB to develop a specific know how for each individual productline. Attention to details allows the company to apply optimum technical solutions and material selections to each and every different project or application.

Other available Catalogues:

Flexible Cables

LT XLPE Power & Control.

HT Cables upto 45KV

EHV Cables upto 132Kv

Fire Survival Cables.

Polycab Wires Pvt. Ltd. takes every precaution to ensure the information given in this publication is correct. E & O.E. all information is subject to change without notice.

POLYCAB WIRES & CABLES
AN ISO 9001:2000 COMPANY

The cables are suitable for use on AC single phase or three phase (earthed or unearthed) systems for rated voltage up to and including 1100 volts. These cables can be used on DC systems for rated voltage up to and including 1500 volts to earth.

CONDUCTOR

The most acceptable metals for conductors are copper and aluminium due to their higher conductivity and ductility.

As copper has got higher affinity for sulphur, it corrodes in the atmosphere where sulphur fumes are present. In these conditions tinned copper should be used. Aluminium oxide film which is always present on Aluminium conductor surface acts as barrier and it protects the Aluminium conductor from corrosion in fumes laden atmosphere.

CONDUCTOR CONSTRUCTION

The most economical construction for conductor is solid conductor i.e. conductor is made of one single wire. As the area of conductor increase, solid conductor becomes more stiff and hence difficult to handle. In this case stranded construction is adopted. Here the conductor is made of number of strands. The strands are arranged in spiral layers in 1+6+12+18+…….. formations. This construction provides more flexibility. Where crimping of lugs are required, the conductor has to be of stranded construction only.

To economise in insulating material, weight and overall diameter, shaped conductors are employed in bigger sized cables. Here the stranded conductor is shaped in to a segment of a circle so that when all the cores are laid, they form a complete circle. These segments are identified as 2 Core – 180 degree, 3 Core – 120 degree, 4 Core – 90 degree and 3.5 Core – 100/60 degree.

I.S. 1554 permits solid conductor construction upto 10 sq.mm in Aluminium and upto 6 sq.mm in copper. It permits the use of shaped conductors for sizes from 16 sq.mm onwards.

INSULATION

The PVC covering over conductor is called insulation and is provided by extrusion process only. The insulated conductor is called core.

I.S. 1554 permits two types of PVC insulation as follows :

1) Insulation with TYPE A PVC compound as per I.S. 5831 which is suitable for 70 deg.C continuous operation.
2) Insulation with TYPE C PVC compound as per I.S. 5831 which is suitable for 85 deg.C continuous operation.

The following colour code is used for identification :

Single Core	: Red, Black, Yellow or Blue.
Two Cores	: Red and Black
Three Cores	: Red, Yellow and Blue.
Three & Half	: Red, Yellow, Blue and Reduced neutral Black.
Four Core	: Red, Yellow, Blue and Black.
Five Core	: Red, Yellow, Blue, Black, & Grey
Six Cores	: Two adjacent cores. Blue and Yellow (Counting and direction core) And remaining Grey in each layer. OR By printing numbers on each core.

LAYING UP

The cores are laid up with suitable lay. The final layer always has a right hand lay i.e. if you look along the cable, the cores move to your right hand.

INNERSHEATH

Innersheath is provided over the laid up cores. It is provided to give circular shape to the cable and it provides bedding for the armouring.

I.S. 1554 permits following two methods of applying the innersheath of any thermoplastic material i.e. PVC, Polyethylene, etc.

a) EXTRUDED INNERSHEATH: Here the innersheath is provided by extrusion of Thermoplastic over the laid up cores. This type of the innersheath is generally provided in cables having round cores i.e in control cables and in power cables upto 10 sq.mm size. This type of the innersheath also acts as a water barrier between cores

and outersheath. In case of a puncture in the outersheath the water can not reach to the cores and hence we recommend that cables for outdoor underground uses should have extruded innersheath.

b) **TAPPED INNERSHEATH:** Here the innersheath is provided by wrapping a thermoplastic tape over the laid up cores. It is generally employed in cables having sector shaped cored i.e. multicore cables of 16 sq.mm and above.

This method saves a process and hence manufacturers always provide this type of innersheath unless the purchase specifications ask for extruded innersheath.

ARMOURING

In case of armoured cables, generally galvanized steel wire / strip armouring is provided over the innersheath in multi-core cables and Aluminium Round Wire or Aluminium Strip over the insulation in single core cables. It provides mechanical protection to inside cores and it carries earth return current in case of a short circuit of a core with armour.

As per I.S. 1554 (Part I) 1988, round wire armouring is provided in cable, where calculated diameter under armour is upto 13 mm. Above this the armouring is either with round wire or strip of size 4 mm x 0.80 mm. As strip construction is economical, the manufacturers always provide steel strip armouring unless wire armouring is specially specified.

In long run of cables and in case of mines, round wire armouring is must, as strip construction provides higher resistance to earth fault current and sometimes this current may not be sufficient to operate the circuit breaker in case of earth fault.

In mines, the resistance of the armour in no case should exceed the resistance of the main core by more than 33% for safety reasons. To achieve this, sometimes tinned hard drawn copper wires are required to be used along with galvanized steel wires. Sometimes two layers of Round Steel Wire or Steel Strip are applied in opposite direction with barrier tape in between are provided to give extra protection.

In case of single core armoured cables for use in AC circuits, the material for armouring has to be non magnetic, as in this case the return current is not passing through the same cable and hence it will not cancel the magnetic lines produced by the current. These magnetic lines which are oscillating in case of AC current will give rise to eddy current in magnetic armouring and hence armouring will become hot, and this may lead to the failure of the cable. Generally hard drawn aluminium wires / strip are used for armouring in this case.

OUTERSHEATH

The PVC covering over the armouring in case of armoured cables and over the innersheath in case of unarmoured cables is called outersheath.

I.S. 1554 specifies nominal and minimum thicknesses of outer sheath for unarmoured cables and only minimum thickess of outer sheath for armoured cables.

It permits the following types of outer sheath PVC compounds.

1) Outer sheath with type ST1 PVC compound as per IS-5831, which is suitable for 70°C continuous operation.
2) Outer sheath with Type ST2 PVC compound as per IS-5831, which is suitable for 85°C continuous operation.

PVC has got fire retardant properties due to its halogen content. The fire in the cable gets extinguished immediately on removal of the fire source.

In the modern Power, Chemical, Fertilizer and Cement Plants many PVC cables are bunched in the cable shaft or on cable trays. In case of fire in these cables, the fire becomes self sustaining. Moreover due to the burning of PVC a dense corrosive

smoke is emitted which makes fire fighting very difficult, due to poor visibility and toxic nature of the smoke. HCL content of the smoke, not only damages other costly equipment lying nearby, but also penetrates the RCC and corrodes the steel reinforcement. Due to this there is an extensive damage to the property.

To overcome these deficiencies FRLS i.e. Fire Retardant Low Smoke PVC was developed.

If required, we can provide Fire Retardant Low Smoke (FRLS) PVC Inner sheath and / or outer sheath. This PVC compound, apart from meeting the requirements of Type ST2 as per IS-5831, has got better fire retardant properties and it emits lower smoke and acid fumes when it catches fire. (For more information please refer our catalogue on FRLS cables).

CABLE CODE

The following codes are used for designating the cables as per IS-1554.

CONSTITUENT	CODE LETTER
COPPER CONDUCTOR	—
ALUMINIUM CONDUCTOR	A
PVC INSULATION	Y
STEEL ROUND WIRE ARMOUR	W
STEEL STRIP ARMOUR	F
STEEL DOUBLE ROUND WIRE ARMOUR	WW
STEEL DOUBLE STRIP ARMOUR	FF
PVC OUTER SHEATH	Y

YWY means Copper conductor, PVC insulated, round wire armoured and PVC sheathed cable.
AYFY means Aluminium conductor, PVC insulated, steel strip armoured and PVC sheathed cable.

EXAMPLES

3 Core x 2.50 sq.mm YWY : Plain Copper conductor, PVC insulated, laid up, innersheathed, G.I. wire armoured and PVC sheathed cable having 3 cores of 2.50 sq.mm conductor size.

4 core x 4.0 sq.mm AYWY: Aluminium conductor, PVC insulated, laid up, innersheathed, G.I. wire armoured and PVC sheathed cable having 4 cores of 4.0 sq.mm conductor size.

3 ½ core x 50 sq.mm AYFY: Aluminium conductor, PVC insulated, laid up, innersheathed, Steel strip armoured and PVC sheathed cable having 3 cores of 50 sq.mm and 1 core of 25 sq.mm conductor size.

The following tables give construction details of Polycab cables as per IS: 1554 ({Part I) 1988.

For current rating of Polycab cables with H.R. insulation increase the rating given in the following tables by 15%.

The weights of the cables mentioned in the following tables are approximate and given for guidance only. They should never be used as criteria to check the lengths of the cables supplied. The best way to check the length of the supplied cable is by resistance method. Take the resistance of the full drum and divide the reading by the resistance of 1 mtr. length.

To decide the size of the conductor, particularly that of the sector shaped conductor, we recommend the following method.

Take weight of a small conductor piece and measure its weight in grams. Then find out the weight of the conductor in gms per meter length. Divide it by 2.7 in case of Aluminium and by 8.9 in case of copper. It will give the area of the conductor in sq.mm.

TABLE-1 "POLYCAB" 1.1 KV SINGLE CORE, ALUMINIUM CONDUCTOR, PVC INSULATED ALUMINIUM WIRE / STRIP

ARMOURED & PVC SHEATHED CABLES CONFORMING TO IS:1554 (PART I) AMENDED UPTO DATE

Nominal Cross Sectional Area	Nominal Thickness of Insulation	Armour		Nominal Thickness of Outer Sheath	Approx. Overall Diameter	Approx. Weight of Cable	Max. Dc Conductor Resistance at 20°C	Current Ratings					
		Aluminium Wire Dia	Aluminium Strip Thickness					Direct In Ground		In Duct		In Air	
								2 Cables	3 Cables	2 Cables	3 Cables	2 Cables	3 Cables
Sq.mm	mm	mm	mm	mm	mm	kg/mm	Ohm/Km	Amps	Amps	Amps	Amps	Amps	Amps
*4	1.3	1.4	-	1.24	11.0	155	7.410	36	31	33	30	32	27
*6	1.3	1.4	-	1.24	12.0	175	4.610	44	39	42	37	41	35
*10	1.3	1.4	-	1.24	13.0	205	3.080	50	51	56	51	56	47
16	1.3	1.4	-	1.24	14.0	230	1.910	75	66	71	65	72	64
25	1.5	1.4	-	1.24	15.0	300	1.200	97	86	93	84	99	84
35	1.5	1.4	-	1.24	16.0	350	0.868	97	100	110	100	120	105
50	1.7	1.4	-	1.24	18.0	430	0.641	120	120	130	115	150	130
70	1.7	1.4	-	1.40	20.0	530	0.443	145	140	155	135	185	155
95	1.9	-	4 x 0.80	1.40	21.0	610	0.320	170	175	180	155	215	190
120	1.9	-	4 x 0.80	1.40	22.0	710	0.253	205	195	200	170	240	220
150	2.1	-	4 x 0.80	1.40	24.0	840	0.206	230	220	220	190	270	250
185	2.3	-	4 x 0.80	1.40	26.0	1020	0.164	265	240	240	210	305	290
240	2.5	-	4 x 0.80	1.40	29.0	1250	0.125	300	270	270	225	350	335
300	2.7	-	4 x 0.80	1.56	32.0	1500	0.100	335	295	295	245	395	380
400	3.0	-	4 x 0.80	1.56	36.0	1910	0.078	370	325	335	275	455	435
500	3.4	-	4 x 0.80	1.56	40.0	2350	0.061	410	345	355	295	490	480
630	3.9	-	4 x 0.80	1.72	44.0	2920	0.047	435	390	395	320	560	550
800	3.9	-	4 x 0.80	1.88	48.0	3510	0.037	525	440	420	350	650	640
1000	3.9	-	4 x 0.80	2.04	53.0	4300	0.029	570	490	445	380	735	720

* If required, these sizes can be offered with stranded conductors also

TABLE 2 "POLYCAB" 1.1 KV SINGLE CORE, ALUMINIUM CONDUCTOR, PVC INSULATED

UNARMOURED PVC SHEATHED CABLES CONFORMING TO IS:1554 (PART I) AMENDED UPTO DATE

Nominal Cross Sectional Area	Nominal Thickness of Insulation	Nominal Thickness of Outer Sheath	Approx. Overall Diameter	Approx. Weight of Cable	Max. Dc Conductor Resistance at 20°C	Current Ratings					
						Direct In Ground		In Duct		In Air	
						2 Cables	3 Cables	2 Cables	3 Cables	2 Cables	3 Cables
Sq. mm	mm	mm	mm	Kgs./Km	Ohm/Km	Amps.	Amps.	Amps.	Amps.	Amps.	Amps.
*1.5	0.8	1.8	7.0	55	18.100	21	17	19	17	18	15
*2.5	0.9	1.8	7.5	65	12.100	28	24	25	24	25	21
*4.0	1.0	1.8	8.0	75	7.410	36	31	33	30	32	27
*6.0	1.0	1.8	9.0	90	4.610	44	39	42	37	41	35
*10	1.0	1.8	10.0	105	3.080	54	51	56	51	56	47
16	1.0	1.8	11.0	140	1.910	75	66	71	65	72	64
25	1.2	1.8	12.5	195	1.200	97	86	93	84	99	84
35	1.2	1.8	13.5	235	0.868	120	100	110	100	120	105
50	1.4	1.8	15.0	305	0.641	145	120	130	115	150	130
70	1.4	1.8	17.0	385	0.443	170	140	155	135	185	155
95	1.6	1.8	19.0	515	0.320	205	175	180	155	215	190
120	1.6	2.0	21.0	610	0.253	230	195	200	170	240	220
150	1.8	2.0	22.5	735	0.206	265	220	220	190	270	250
185	2.0	2.0	25.0	885	0.164	300	240	240	210	305	290
240	2.2	2.0	28.0	1100	0.125	335	270	270	225	350	335
300	2.4	2.0	30.0	1335	0.100	370	295	295	245	395	380
400	2.6	2.2	34.0	1665	0.078	410	325	335	275	455	435
500	3.0	2.2	38.0	2130	0.061	435	345	355	295	490	480
630	3.4	2.4	43.0	2685	0.047	485	390	395	320	560	550
800	3.4	2.4	47.0	3255	0.037	525	440	420	350	650	640
1000	3.4	2.6	51.5	3960	0.029	570	490	445	380	735	720

* If required, these sizes can be offered with stranded conductors also

POLYCAB WIRES & CABLES
AN ISO 9001:2000 COMPANY

TABLE-3 "POLYCAB" 1.1 KV SINGLE CORE, COPPER CONDUCTOR, PVC INSULATED ALUMINIUM WIRE / STRIP

ARMOURED & PVC SHEATHED CABLES CONFORMING TO IS:1554 (PART I) AMENDED UPTO DATE

Nominal Cross Sectional Area	Nominal Thickness of Insulation	Armour		Nominal Thickness of Outer Sheath	Approx. Overall Diameter	Approx. Weight of Cable	Max. Dc Conductor Resistance at 20°C	Current Ratings					
		Aluminium Wire Dia	Aluminium Strip Thickness					Direct In Ground		In Duct		In Air	
								2 Cables	3 Cables	2 Cables	3 Cables	2 Cables	3 Cables
Sq. mm	mm	mm	mm	mm	mm	Kgs/Km	Ohm/Km	Amps.	Amps.	Amps.	Amps.	Amps.	Amps.
*4	1.3	1.4	-	1.24	11.0	180	4.610	46	39	42	38	43	35
*6	1.3	1.4	-	1.24	12.0	215	3.080	57	49	54	48	54	44
*10	1.3	1.4	-	1.24	13.0	270	1.830	75	65	72	64	72	60
16	1.3	1.4	-	1.24	14.0	330	1.150	94	85	92	83	92	82
25	1.5	1.4	-	1.24	15.0	460	0.727	125	110	120	110	125	110
35	1.5	1.4	-	1.24	16.0	575	0.524	150	130	140	125	155	130
50	1.7	1.4	-	1.24	18.0	740	0.387	180	155	165	150	190	165
70	1.7	1.4	-	1.40	20.0	970	0.268	220	190	200	175	235	205
95	1.9	-	4 x 0.80	1.40	21.0	1200	0.193	265	220	230	200	275	245
120	1.9	-	4 x 0.80	1.40	22.0	1460	0.153	300	250	255	220	310	280
150	2.1	-	4 x 0.80	1.40	24.0	1770	0.124	340	280	280	245	345	320
185	2.3	-	4 x 0.80	1.40	26.0	2170	0.099	380	305	305	260	390	370
240	2.5	-	4 x 0.80	1.40	29.0	2740	0.075	420	345	340	285	445	425
300	2.7	-	4 x 0.80	1.56	32.0	3360	0.060	465	375	370	310	500	475
400	3.0	-	4 x 0.80	1.56	36.0	4400	0.047	500	400	405	335	570	550
500	3.4	-	4 x 0.80	1.56	40.0	5450	0.037	540	425	430	355	610	590
630	3.9	-	4 x 0.80	1.72	44.0	6820	0.028	590	470	465	375	680	660

* If required, these sizes can be offered with stranded conductors also

TABLE-4 "POLYCAB" 1.1 KV SINGLE CORE, COPPER CONDUCTOR, PVC INSULATED

UNARMOURED PVC SHEATHED CABLES CONFORMING TO IS:1554 (PART I) AMENDED UPTO DATE

Nominal Cross Sectional Area	Nominal Thickness of Insulation	Nominal Thickness of Outer Sheath	Approx. Overall Diameter	Approx. Weight of Cable	Max. Dc Conductor Resistance at 20°C	Current Ratings					
						Direct In Ground		In Duct		In Air	
						2 Cables	3 Cables	2 Cables	3 Cables	2 Cables	3 Cables
Sq. mm	mm	mm	mm	Kgs./Km	Ohm/Km	Amps.	Amps.	Amps.	Amps.	Amps.	Amps.
*1.5	0.8	1.8	7.0	65	12.100	25	22	23	21	24	20
*2.5	0.9	1.8	7.5	82	7.410	35	30	31	29	32	27
*4.0	1.0	1.8	8.0	100	4.610	46	39	42	38	43	35
*6.0	1.0	1.8	9.0	130	3.080	57	49	54	48	54	44
*10	1.0	1.8	10.0	170	1.830	75	65	72	64	72	60
16	1.0	1.8	11.0	240	1.150	94	85	92	83	92	82
25	1.2	1.8	12.5	350	0.727	125	110	120	110	125	110
35	1.2	1.8	13.5	455	0.524	150	130	140	125	155	130
50	1.4	1.8	15.0	620	0.387	180	155	165	150	190	165
70	1.4	1.8	17.0	820	0.268	220	190	200	175	235	205
95	1.6	1.8	19.0	1105	0.193	265	220	230	200	275	245
120	1.6	2.0	21.0	1355	0.153	300	250	255	220	310	280
150	1.8	2.0	22.5	1665	0.124	340	280	280	245	345	320
185	2.0	2.0	25.0	2040	0.099	380	305	305	260	390	370
240	2.2	2.0	28.0	2590	0.075	420	345	340	285	445	425
300	2.4	2.0	30.0	3200	0.060	465	375	370	310	500	475
400	2.6	2.2	34.0	4150	0.047	500	400	405	335	570	550
500	3.0	2.2	38.0	5230	0.370	540	425	430	355	610	590
630	3.4	2.4	43.0	6600	0.280	590	470	465	375	680	660

* If required, these sizes can be offered with stranded conductors also

TABLE-5 "POLYCAB" 1.1 KV TWIN CORE, ALUMINIUM CONDUCTOR, PVC INSULATED, INNER SHEATHED,

ARMOURED PVC SHEATHED CABLES CONFORMING TO IS : 1554 (PART I) AMENDED UPTO DATE

Nominal Cross Sectional Area	Nominal Thickness of Insulation	Nominal Thickness of Inner Sheath	Armour		Minimum Thickness of Outer Sheath	Approx. Overall Diameter	Approx. Weight of Cable	Max. Dc Conductor Resistance at 20°C	Current Ratings		
			Galv. Round Steel Wire Nominal Dia.	Galv. Flat Steel Strip Nominal Thickness					Direct In Ground	In Ducts	In Air
Sq. mm	mm	mm	mm	mm	mm	mm	Kgs./Km	Ohm/Km	Amps.	Amps.	Amps.
*1.5	0.8	0.3	1.4	-	1.24	12.5	320	18.100	18	16	16
*2.5	0.9	0.3	1.4	-	1.24	13.5	380	12.100	25	21	21
*4.0	1.0	0.3	1.4	-	1.24	15.0	450	7.410	32	27	27
*6.0	1.0	0.3	1.4	-	1.24	16.0	500	4.610	40	34	35
*10	1.0	0.3	1.4	-	1.24	18.0	600	3.080	55	45	47
16	1.0	0.3	-	0.8	1.40	18.0	500	1.910	70	58	59
25	1.2	0.3	-	0.8	1.40	20.0	650	1.200	90	76	78
35	1.2	0.3	-	0.8	1.40	21.5	750	0.868	110	92	99
50	1.4	0.3	-	0.8	1.40	24.5	950	0.641	135	115	125
70	1.4	0.3	-	0.8	1.56	28.0	1150	0.443	160	140	150
95	1.6	0.4	-	0.8	1.56	31.0	1460	0.320	190	170	185
120	1.6	0.4	-	0.8	1.56	33.0	1670	0.253	210	190	210
150	1.8	0.4	-	0.8	1.72	37.0	2010	0.206	240	210	240
185	2.0	0.5	-	0.8	1.88	40.5	2450	0.164	275	240	275
240	2.2	0.5	-	0.8	2.04	45.0	2950	0.125	320	275	325
300	2.4	0.6	-	0.8	2.20	50.0	3560	0.100	355	305	365
400	2.6	0.7	-	0.8	2.36	56.0	4500	0.078	385	345	420
500	3.0	0.7	-	0.8	2.68	62.5	5600	0.061	410	370	450

* If required, these sizes can be offered with standard conductors also

TABLE-6 POLYCAB 1.1 KV TWIN CORE, ALUMINIUM CONDUCTOR, PVC INSULATED, INNER SHEATHED,

UNARMOURED, PVC SHEATHED CABLES CONFORMING TO IS: 1554 (PART I) AMENDED UPTO DATE.

Nominal Cross Sectional Area	Nominal Thickness of Insulation	Nominal Thickness of Inner Sheath	Nominal Thickness of Outer Sheath	Approx. Overall Diameter	Approx. Weight of Cable	Max. Dc Conductor Resistance at 20°C	Current Ratings		
							Direct In Ground	In Ducts	In Air
Sq. mm	mm	mm	mm	mm	Kgs./Km	Ohm/Km	Amps.	Amps.	Amps.
*1.5	0.8	0.3	1.8	11.0	115	18.100	18	16	16
*2.5	0.9	0.3	1.8	12.0	150	12.100	25	21	21
*4.0	1.0	0.3	1.8	13.5	185	7.410	32	27	27
*6.0	1.0	0.3	1.8	14.5	220	4.610	40	34	35
*10	1.0	0.3	1.8	16.0	275	3.080	55	45	47
16	1.0	0.3	1.8	17.5	285	1.910	70	58	59
25	1.2	0.3	2.0	19.5	405	1.200	90	76	78
35	1.2	0.3	2.0	20.5	490	0.868	110	92	99
50	1.4	0.3	2.0	24.0	650	0.641	135	115	125
70	1.4	0.3	2.0	27.0	800	0.443	160	140	150
95	1.6	0.4	2.2	28.5	1065	0.320	190	170	185
120	1.6	0.4	2.2	33.0	1250	0.253	210	190	210
150	1.8	0.4	2.4	34.0	1550	0.206	240	210	240
185	2.0	0.5	2.4	37.0	1880	0.164	275	240	275
240	2.2	0.5	2.6	42.5	2400	0.125	320	275	325
300	2.4	0.6	2.8	45.5	2920	0.100	355	305	365
400	2.6	0.7	3.2	51.5	3815	0.078	385	345	420
500	3.0	0.7	3.4	57.0	4750	0.061	410	370	450

* If required, these sizes can be offered with stranded conductors also

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TABLE-7 "POLYCAB" KV TWIN CORE, COPPER CONDUCTOR, PVC INSULATED, INNER SHEATHED,

ARMOURED PVC SHEATHED CABLES CONFORMING TO IS : 1554 (PART I) AMENDED UPTO DATE

Nominal Cross Sectional Area	Nominal Thickness of Insulation	Nominal Thickness of Inner Sheath	Armour		Minimum Thickness of Outer Sheath	Approx. Overall Diameter	Approx. Weight of Cable	Max. Dc Conductor Resistance at 20°C	Current Ratings		
			Galv. Round Steel Wire Nominal Dia.	Galv. Flat Steel Strip Nominal Thickness					Direct In Ground	In Ducts	In Air
Sq. mm	mm	mm	mm	mm	mm	mm	Kgs./Km	Ohm/Km	Amps.	Amps.	Amps.
*1.5	0.8	0.3	1.4	-	1.24	12.5	350	12.100	23	20	20
*2.5	0.9	0.3	1.4	-	1.24	13.5	415	7.410	32	27	27
*4.0	1.0	0.3	1.4	-	1.24	15.0	500	4.610	41	35	35
*6.0	1.0	0.3	1.4	-	1.24	16.0	580	3.080	50	44	45
*10	1.0	0.3	1.4	-	1.24	18.0	730	1.830	70	58	60
16	1.0	0.3	-	0.8	1.40	18.0	740	1.150	90	75	78
25	1.2	0.3	-	0.8	1.40	20.0	960	0.727	115	97	105
35	1.2	0.3	-	0.8	1.40	21.5	1200	0.524	140	120	125
50	1.4	0.3	-	0.8	1.40	24.5	1580	0.387	165	145	155
70	1.4	0.3	-	0.8	1.56	28.0	2020	0.268	205	180	195
95	1.6	0.4	-	0.8	1.56	31.0	2650	0.193	240	215	230
120	1.6	0.4	-	0.8	1.56	33.0	3160	0.153	275	235	265
150	1.8	0.4	-	0.8	1.72	37.0	3870	0.124	310	270	305
185	2.0	0.5	-	0.8	1.88	40.5	4750	0.099	350	300	350
240	2.2	0.5	-	0.8	2.04	45.0	5930	0.075	405	345	410
300	2.4	0.6	-	0.8	2.20	56.0	7300	0.060	450	385	465
400	2.6	0.7	-	0.8	2.36	55.9	9450	0.047	490	425	530

* If required, these sizes can be offered with standard conductors also

TABLE-8 POLYCAB 1.1 KV TWIN CORE, COPPER CONDUCTOR, PVC INSULATED, INNER SHEATHED

UNARMOURED, PVC SHEATHED CABLES CONFORMING TO IS: 1554 (PART I) AMENDED UPTO DATE.

Nominal Cross Sectional Area	Nominal Thickness of Insulation	Nominal Thickness of Inner Sheath	Nominal Thickness of Outer Sheath	Approx. Overall Diameter	Approx. Weight Of Cable	Max. Dc Conductor Resistance at 20°C	Current Ratings		
							Direct In Ground	In Ducts	In Air
Sq. mm	mm	mm	mm	mm	Kgs./Km	Ohm/Km	Amps.	Amps.	Amps.
*1.5	0.8	0.3	1.8	11.0	135	12.100	23	20	20
*2.5	0.9	0.3	1.8	12.0	185	7.410	32	27	27
*4.0	1.0	0.3	1.8	13.5	235	4.610	41	35	35
*6.0	1.0	0.3	1.8	14.5	295	3.080	50	44	45
*10	1.0	0.3	1.8	16.0	400	1.830	70	58	60
16	1.0	0.3	1.8	17.5	485	1.150	90	75	78
25	1.2	0.3	2.0	19.5	715	0.727	115	97	105
35	1.2	0.3	2.0	20.5	925	0.524	140	120	125
50	1.4	0.3	2.0	24.0	1270	0.387	165	145	155
70	1.4	0.3	2.0	27.0	1670	0.268	205	180	195
95	1.6	0.4	2.2	28.5	2250	0.193	240	215	230
120	1.6	0.4	2.2	33.0	2750	0.153	275	235	265
150	1.8	0.4	2.4	34.0	3410	0.124	310	270	305
185	2.0	0.5	2.4	37.0	4170	0.099	350	300	350
240	2.2	0.5	2.6	42.5	5370	0.075	405	345	410
300	2.4	0.6	2.8	45.5	6640	0.060	450	385	465
400	2.6	0.7	3.2	51.5	8770	0.047	490	425	530

* If required, these sizes can be offered with stranded conductors also

TABLE-9 "POLYCAB" 1.1 KV THREE CORE, ALUMINIUM CONDUCTOR, PVC INSULATED, INNER SHEATHED,

ARMOURED PVC SHEATHED CABLES CONFORMING TO IS : 1554 (PART I) AMENDED UPTO DATE

Nominal Cross Sectional Area	Nominal Thickness of Insulation	Nominal Thickness of Inner Sheath	Armour		Minimum Thickness of Outer Sheath	Approx. Overall Diameter	Approx. Weight of Cable	Max. Dc Conductor Resistance at 20°C	Current Ratings		
			Galv. Round Steel Wire Nominal Dia.	Galv. Flat Steel Strip Nominal Thickness					Direct In Ground	In Ducts	In Air
Sq. mm	mm	mm	mm	mm	mm	mm	Kgs./Km	Ohm/Km	Amps.	Amps.	Amps.
*1.5	0.8	0.3	1.4	-	1.24	12.5	375	18.100	16	14	13
*2.5	0.9	0.3	1.4	-	1.24	14.0	425	12.100	21	18	18
*4.0	1.0	0.3	1.4	-	1.24	15.5	500	7.410	28	23	23
*6.0	1.0	0.3	1.4	-	1.24	17.0	575	4.610	35	30	30
*10	1.0	0.3	1.4	-	1.4	19.0	700	3.080	46	39	40
16	1.0	0.3	-	0.8	1.40	20.0	650	1.910	60	50	51
25	1.2	0.3	-	0.8	1.40	22.0	800	1.200	76	63	70
35	1.2	0.3	-	0.8	1.40	25.0	950	0.868	92	77	86
50	1.4	0.3	-	0.8	1.56	27.0	1200	0.641	110	95	105
70	1.4	0.4	-	0.8	1.56	31.0	1500	0.443	135	115	130
95	1.6	0.4	-	0.8	1.56	34.0	1900	0.320	165	140	155
120	1.6	0.4	-	0.8	1.72	38.0	2240	0.253	185	155	180
150	1.8	0.5	-	0.8	1.88	42.0	2700	0.206	210	175	205
185	2.0	0.5	-	0.8	1.88	46.0	3200	0.164	235	200	240
240	2.2	0.6	-	0.8	2.20	52.0	3990	0.125	275	235	280
300	2.4	0.6	-	0.8	2.36	56.5	4850	0.100	305	260	315
400	2.6	0.7	-	0.8	2.52	64.0	6100	0.078	335	290	375
500	3.0	0.7	-	0.8	2.84	72.0	7600	0.061	350	310	410

* If required, these sizes can be offered with standard conductors also

TABLE-10 "POLYCAB" 1.1 KV THREE CORE, ALUMINIUM CONDUCTOR, PVC INSULATED, INNER SHEATHED

UNARMOURED PVC SHEATHED CABLES CONFORMING TO IS : 1554 (PART I) AMENDED UPTO DATE

Nominal Cross Sectional Area	Nominal Thickness of Insulation	Nominal Thickness of Inner Sheath	Nominal Thickness of Outer Sheath	Approx. Overall Diameter	Approx. Weight Of Cable	Max. Dc Conductor Resistance at 20°C	Current Ratings		
							Direct In Ground	In Ducts	In Air
Sq. mm	mm	mm	mm	mm	Kgs./Km	Ohm/Km	Amps.	Amps.	Amps.
*1.5	0.8	0.3	1.8	11.5	130	18.100	16	14	13
*2.5	0.9	0.3	1.8	12.5	170	12.100	21	18	18
*4.0	1.0	0.3	1.8	13.5	210	7.410	28	23	23
*6.0	1.0	0.3	1.8	15.0	255	4.610	35	30	30
*10	1.0	0.3	1.8	16.5	325	3.080	46	39	40
16	1.0	0.3	1.8	17.5	360	1.910	60	50	51
25	1.2	0.3	2.0	22.0	520	1.200	76	63	70
35	1.2	0.3	2.0	23.0	640	0.868	92	77	86
50	1.4	0.3	2.0	27.0	850	0.641	110	95	105
70	1.4	0.4	2.2	31.0	1110	0.443	135	115	130
95	1.6	0.4	2.2	33.0	1425	0.320	165	140	155
120	1.6	0.4	2.2	36.0	1690	0.253	185	155	180
150	1.8	0.5	2.4	41.0	2120	0.206	210	175	205
185	2.0	0.5	2.6	45.0	2600	0.164	235	200	240
240	2.2	0.6	2.8	50.0	3290	0.125	275	235	280
300	2.4	0.6	3.0	55.5	4050	0.100	305	260	315
400	2.6	0.7	3.4	63.5	5290	0.078	335	290	375
500	3.0	0.7	3.8	71.0	6570	0.061	350	310	410

* If required, these sizes can be offered with stranded conductors also

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TABLE-11 "POLYCAB" 1.1 KV THREE CORE, COPPER CONDUCTOR, PVC INSULATED, INNER SHEATHED,

ARMOURED PVC SHEATHED CABLES CONFORMING TO IS : 1554 (PART I) AMENDED UPTO DATE

Nominal Cross Sectional Area	Nominal Thickness of Insula-tion	Nominal Thickness of Inner Sheath	Armour		Minimum Thickness Of Outer Sheath	Approx. Overall Diameter	Approx. Weight of Cable	Max. Dc Conductor Resistance at 20°C	Current Ratings		
			Galv. Round Steel Wire Nominal Dia.	Galv. Flat Steel Strip Nominal Thickness					Direct In Ground	In Ducts	In Air
Sq. mm	mm	mm	mm	mm	mm	mm	Kgs./Km	Ohm/Km	Amps.	Amps.	Amps.
*1.5	0.8	0.3	1.4	-	1.24	12.5	405	12.100	21	17	17
*2.5	0.9	0.3	1.4	-	1.24	14.0	475	7.410	27	24	24
*4.0	1.0	0.3	1.4	-	1.24	15.5	580	4.610	36	30	30
*6.0	1.0	0.3	1.4	-	1.24	17.0	700	3.080	45	38	39
*10	1.0	0.3	1.4	-	1.40	19.0	890	1.830	60	50	52
16	1.0	0.3	-	0.8	1.40	20.0	950	1.150	77	64	66
25	1.2	0.3	-	0.8	1.40	22.0	1270	0.727	99	81	90
35	1.2	0.3	-	0.8	1.40	25.0	1600	0.524	120	99	110
50	1.4	0.3	-	0.8	1.56	27.0	2150	0.387	145	125	135
70	1.4	0.4	-	0.8	1.56	31.0	2800	0.268	175	150	165
95	1.6	0.4	-	0.8	1.56	34.0	3670	0.193	210	175	200
120	1.6	0.4	-	0.8	1.72	38.0	4470	0.153	240	195	230
150	1.8	0.5	-	0.8	1.88	42.0	5500	0.124	270	225	265
185	2.0	0.5	-	0.8	1.88	46.0	6650	0.099	300	255	305
240	2.2	0.6	-	0.8	2.2	52.0	8450	0.075	345	295	355
300	2.4	0.6	-	0.8	2.36	56.5	10450	0.060	385	335	400
400	2.6	0.7	-	0.8	2.52	64.0	13525	0.047	425	360	455

* If required, these sizes can be offered with standard conductors also

TABLE-12 "POLYCAB" 1.1 KV THREE CORE, COPPER CONDUCTOR, PVC INSULATED, INNER SHEATHED

UNARMOURED PVC SHEATHED CABLES CONFORMING TO IS : 1554 (PART I) AMENDED UPTO DATE

Nominal Cross Sectional Area	Nominal Thickness of Insulation	Nominal Thickness of Inner Sheath	Nominal Thickness of Outer Sheath	Approx. Overall Diameter	Approx. Weight of Cable	Max. Dc Conductor Resistance at 20°C	Current Ratings		
							Direct In Ground	In Ducts	In Air
Sq. mm	mm	mm	mm	mm	Kgs./Km	Ohm/Km	Amps.	Amps.	Amps.
*1.5	0.8	0.3	1.8	11.5	160	12.100	21	17	17
*2.5	0.9	0.3	1.8	12.5	220	7.410	27	24	24
*4.0	1.0	0.3	1.8	13.5	290	4.610	36	30	30
*6.0	1.0	0.3	1.8	15.0	370	3.080	45	38	39
*10	1.0	0.3	1.8	16.5	510	1.830	60	50	52
16	1.0	0.3	1.8	17.5	660	1.150	77	64	66
25	1.2	0.3	2.0	22.0	990	0.727	99	81	90
35	1.2	0.3	2.0	23.0	1290	0.524	120	99	110
50	1.4	0.3	2.0	27.0	1780	0.387	145	125	135
70	1.4	0.4	2.2	31.0	2410	0.268	175	150	165
95	1.6	0.4	2.2	33.0	3190	0.193	210	175	200
120	1.6	0.4	2.2	36.0	3920	0.153	240	195	230
150	1.8	0.5	2.4	41.0	4910	0.124	270	225	265
185	2.0	0.5	2.6	45.0	6040	0.099	300	255	305
240	2.2	0.6	2.8	50.0	7750	0.075	345	295	355
300	2.4	0.6	3.0	55.5	9620	0.060	385	335	400
400	2.6	0.7	3.4	63.5	12715	0.047	425	360	455

* If required, these sizes can be offered with stranded conductors also

TABLE-13 "POLYCAB" 1.1 KV 3 $^{1}/_{2}$ CORE, ALUMINIUM CONDUCTOR, PVC INSULATED, INNER SHEATHED,

ARMOURED PVC SHEATHED CABLES CONFORMING TO IS : 1554 (PART I) AMENDED UPTO DATE

Nominal Cross Ssectional Area		Nominal Thickness of Insulation		Minimum Thick-ness of Inner Sheath	Armour	Minimum Thick-ness of Outer Sheath	Approx. Overall Diameter	Approx. Weight of Cable	Max. Dc Conductor Resistance At 20° C		Current Ratings		
Main	Neutral	Main	Neutral		Galv. Flat Steel Strip Nominal Thickness				Main	Neutral	Direct In Ground	In Ducts	In Air
Sq. mm	Sq. mm	mm	mm	mm	mm	mm	mm	Kgs./Km	Ohm/Km	Ohm/Km	Amps.	Amps.	Amps.
25	16	1.2	1.0	0.3	0.8	1.40	23.5	900	1.200	1.910	76	63	70
35	16	1.2	1.0	0.3	0.8	1.40	26.0	1030	0.868	1.910	92	77	86
50	25	1.4	1.2	0.3	0.8	1.56	30.0	1350	0.641	1.200	100	95	105
70	35	1.4	1.2	0.4	0.8	1.56	32.5	1725	0.443	0.868	135	115	130
95	50	1.6	1.4	0.4	0.8	1.56	36.5	2130	0.320	0.641	165	140	155
120	70	1.6	1.4	0.5	0.8	1.72	40.5	2580	0.253	0.443	185	155	180
150	70	1.8	1.4	0.5	0.8	1.88	44.0	3050	0.206	0.443	210	175	205
185	95	2.0	1.6	0.5	0.8	2.04	50.0	3650	0.164	0.320	235	200	240
240	120	2.2	1.6	0.6	0.8	2.20	55.0	4580	0.125	0.253	275	235	280
300	150	2.4	1.8	0.6	0.8	2.36	61.0	5500	0.100	0.206	305	260	315
400	185	2.6	2.0	0.7	0.8	2.68	68.0	7000	0.078	0.164	335	290	375
500	240	3.0	2.2	0.7	0.8	2.84	75.0	8600	0.061	0.125	350	310	410

TABLE-14 "POLYCAB" 1.1 KV 3 1/2 CORE, ALUMINIUM CONDUCTOR, PVC INSULATED, INNER SHEATHED,

UNARMOURED PVC SHEATHED CABLES CONFORMING TO IS : 1554 (PART I) AMENDED UPTO DATE

Nominal Cross Sectional Area		Nominal Thickness of Insulation		Minimum Thickness of Inner Sheath	Nominal Thickness of Outer Sheath	Approx. Overall Diameter	Approx. Weight of Cable	Max. Dc Conductor Resistance at 20°C		Current Ratings		
Main	Neutral	Main	Neutral					Main	Neutral	Direct In Ground	In Ducts	In Air
Sq. mm	Sq. mm	Sq. mm	Sq. mm	mm	mm	mm	Kgs./Km	Ohm/Km	Ohm/Km	Amps.	Amps.	Amps.
25	16	1.2	1.0	0.3	2.0	22.5	615	1.200	1.910	76	63	70
35	16	1.2	1.0	0.3	2.0	25.0	715	0.868	1.910	92	77	86
50	25	1.4	1.2	0.3	2.2	29.0	955	0.641	1.200	110	95	105
70	35	1.4	1.2	0.4	2.2	33.0	1290	0.443	0.868	135	115	130
95	50	1.6	1.4	0.4	2.2	36.5	1640	0.320	0.641	165	140	155
120	70	1.6	1.4	0.5	2.4	39.0	2020	0.253	0.443	185	155	180
150	70	1.8	1.4	0.5	2.4	42.5	2380	0.206	0.443	210	175	205
185	95	2.0	1.6	0.5	2.6	47.0	2945	0.164	0.320	235	200	240
240	120	2.2	1.6	0.6	3.0	54.0	3800	0.125	0.253	275	235	280
300	150	2.4	1.8	0.6	3.2	58.0	4650	0.100	0.206	305	260	315
400	185	2.6	2.0	0.7	3.4	65.0	6000	0.078	0.164	335	290	375
500	240	3.0	2.2	0.7	3.8	74.0	7400	0.061	0.125	350	310	410

POLYCAB WIRES & CABLES
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TABLE-15 "POLYCAB" 1.1 KV 3 1/2 CORE, COPPER CONDUCTOR, PVC INSULATED, INNER SHEATHED,

ARMOURED PVC SHEATHED CABLES CONFORMING TO IS : 1554 (PART I) AMENDED UPTO DATE

Nominal Cross Ssectional Area		Nominal Thickness of Insulation		Minimum Thick-ness of Inner Sheath	Armour	Minimum Thick-ness of Outer Sheath	Approx. Overall Diameter	Approx. Weight of Cable	Max. Dc Conductor Resistance At 20°C		Current Ratings		
Main	Neutral	Main	Neutral		Galv. Flat Steel Strip Nominal Thickness				Main	Neutral	Direct In Ground	In Ducts	In Air
Sq. mm	Sq. mm	mm	mm	mm	mm	mm	mm	Kgs./Km	Ohm/Km	Ohm/Km	Amps.	Amps.	Amps.
25	16	1.2	1.0	0.3	0.8	1.40	23.5	1465	0.727	1.150	99	81	90
35	16	1.2	1.0	0.3	0.8	1.40	26.0	1780	0.524	1.150	120	99	110
50	25	1.4	1.2	0.3	0.8	1.56	30.0	2435	0.387	0.727	145	125	135
70	35	1.4	1.2	0.4	0.8	1.56	32.5	3245	0.268	0.524	175	150	165
95	50	1.6	1.4	0.4	0.8	1.56	36.5	4210	0.193	0.387	210	175	200
120	70	1.6	1.4	0.5	0.8	1.72	40.5	5240	0.153	0.268	240	195	230
150	70	1.8	1.4	0.5	0.8	1.88	44.0	6270	0.124	0.268	270	225	265
185	95	2.0	1.6	0.5	0.8	2.04	50.0	7675	0.099	0.193	300	255	305
240	120	2.2	1.6	0.6	0.8	2.20	55.0	9780	0.075	0.153	345	295	355
300	150	2.4	1.8	0.6	0.8	2.36	61.0	12000	0.060	0.124	385	335	400
400	185	2.6	2.0	0.7	0.8	2.68	68.0	15570	0.047	0.099	425	360	455

TABLE-16 "POLYCAB" 1.1 KV 3 1/2 CORE, COPPER CONDUCTOR, PVC INSULATED, INNER SHEATHED,

UNARMOURED PVC SHEATHED CABLES CONFORMING TO IS : 1554 (PART I) AMENDED UPTO DATE

Nominal Cross Sectional Area		Nominal Thickness of Insulation		Minimum Thickness of Inner Sheath	Nominal Thickness of Outer Sheath	Approx. Overall Diameter	Approx. Weight of Cable	Max. Dc Conductor Resistance at 20°C		Current Ratings		
Main	Neutral	Main	Neutral					Main	Neutral	Direct In Ground	In Ducts	In Air
Sq. mm	Sq. mm	Sq. mm	Sq. mm	mm	mm	mm	Kgs./Km	Ohm/Km	Ohm/Km	Amps.	Amps.	Amps.
25	16	1.2	1.0	0.3	2.0	22.5	1180	0.727	1.150	99	81	90
35	16	1.2	1.0	0.3	2.0	25.0	1465	0.524	1.150	120	99	110
50	25	1.4	1.2	0.3	2.2	29.0	2040	0.387	0.727	145	125	135
70	35	1.4	1.2	0.4	2.2	33.0	2810	0.268	0.524	175	150	165
95	50	1.6	1.4	0.4	2.2	36.5	3715	0.193	0.387	210	175	200
120	70	1.6	1.4	0.5	2.4	39.0	4680	0.153	0.268	240	195	230
150	70	1.8	1.4	0.5	2.4	42.5	5600	0.124	0.268	270	225	265
185	95	2.0	1.6	0.5	2.6	47.0	6970	0.099	0.193	300	255	305
240	120	2.2	1.6	0.6	3.0	54.0	9000	0.075	0.153	345	295	355
300	150	2.4	1.8	0.6	3.2	58.0	11150	0.060	0.124	385	335	400
400	185	2.6	2.0	0.7	3.4	65.0	14570	0.047	0.099	425	360	455

TABLE-17 "POLYCAB" 1.1 KV FOUR CORE, ALUMINIUM CONDUCTOR, PVC INSULATED, INNER SHEATHED,

ARMOURED PVC SHEATHED CABLES CONFORMING TO IS : 1554 (PART I) AMENDED UPTO DATE

Nominal Cross Sectional Area	Nominal Thickness of Insula-tion	Nominal Thickness of Inner Sheath	Armour		Minimum Thickness of Outer Sheath	Approx. Overall Diameter	Approx. Weight of Cable	Max. Dc Conductor Resistance at 20°C	Current Ratings		
			Galv. Round Steel Wire Nominal Dia.	Galv. Flat Steel Strip Nominal Thickness					Direct In Ground	In Ducts	In Air
Sq. mm	mm	mm	mm	mm	mm	mm	Kgs./Km	Ohm/Km	Amps.	Amps.	Amps.
*1.5	0.8	0.3	1.4	-	1.24	15.0	400	18.100	16	14	13
*2.5	0.9	0.3	1.4	-	1.24	16.5	480	12.100	21	18	18
*4.0	1.0	0.3	1.4	-	1.24	18.0	550	7.410	28	23	23
*6.0	1.0	0.3	1.4	-	1.24	19.5	650	4.610	35	30	30
*10	1.0	0.3	-	0.8	1.40	20.0	660	3.080	46	39	40
16	1.0	0.3	-	0.8	1.40	23.0	750	1.910	60	50	51
25	1.2	0.3	-	0.8	1.40	24.0	950	1.200	76	63	70
35	1.2	0.3	-	0.8	1.40	27.0	1165	0.868	92	77	86
50	1.4	0.4	-	0.8	1.56	31.0	1540	0.641	110	95	105
70	1.4	0.4	-	0.8	1.56	35.0	1800	0.443	135	115	130
95	1.6	0.4	-	0.8	1.72	38.0	2400	0.320	165	140	155
120	1.6	0.5	-	0.8	1.88	42.0	2800	0.253	185	155	180
150	1.8	0.5	-	0.8	1.88	46.0	3350	0.206	210	175	205
185	2.0	0.6	-	0.8	2.04	51.0	4000	0.164	235	200	240
240	2.2	0.6	-	0.8	2.36	58.0	5050	0.125	275	235	280
300	2.4	0.7	-	0.8	2.52	66.0	6200	0.100	305	260	315
400	2.6	0.7	-	0.8	2.84	72.0	7850	0.078	335	290	375
500	3.0	0.7	-	0.8	3.00	80.0	9600	0.061	350	310	410

* If required, these sizes can be offered with standard conductors also

TABLE-18 "POLYCAB" 1.1 KV FOUR CORE, ALUMINIUM CONDUCTOR, PVC INSULATED, INNER SHEATHED,

UNARMOURED PVC SHEATHED CABLES CONFORMING TO IS : 1554 (PART I) AMENDED UPTO DATE

Nominal Cross Sectional Area	Nominal Thickness of Insulation	Nominal Thickness of Inner Sheath	Nominal Thickness of Outer Sheath	Approx. Overall Diameter	Approx. Weight Of Cable	Max. Dc Conductor Resistance at 20°C	Current Ratings		
							Direct In Ground Amps	In Ducts Amps	In Air Amps
Sq. mm	mm	mm	mm	mm	Kgs./Km	Ohm/Km	Amps.	Amps.	Amps.
*1.5	0.8	0.3	1.8	12.5	150	18.100	16	14	13
*2.5	0.9	0.3	1.8	14.0	180	12.100	21	18	18
*4.0	1.0	0.3	1.8	15.5	220	7.410	28	23	23
*6.0	1.0	0.3	1.8	17.0	260	4.610	35	30	30
*10	1.0	0.3	1.8	19.0	340	3.080	46	39	40
16	1.0	0.3	2.0	21.5	460	1.910	60	50	51
25	1.2	0.3	2.0	24.0	600	1.200	76	63	70
35	1.2	0.3	2.0	26.5	800	0.868	92	77	86
50	1.4	0.4	2.2	32.5	1100	0.641	110	95	105
70	1.4	0.4	2.2	33.5	1400	0.443	135	115	130
95	1.6	0.4	2.4	38.5	1850	0.320	165	140	155
120	1.6	0.5	2.4	41.5	2250	0.253	185	155	180
150	1.8	0.5	2.6	46.0	2750	0.206	210	175	205
185	2.0	0.6	2.6	50.5	3400	0.164	235	200	240
240	2.2	0.6	3.0	58.0	4300	0.125	275	235	280
300	2.4	0.7	3.4	64.0	5300	0.100	305	260	315
400	2.6	0.7	3.6	72.0	6900	0.078	335	290	375
500	3.0	0.7	4.0	80.0	8600	0.061	350	310	410

* If required, these sizes can be offered with stranded conductors also

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TABLE-19 "POLYCAB" 1.1 KV FOUR CORE, COPPER CONDUCTOR, PVC INSULATED, INNER SHEATHED,

ARMOURED PVC SHEATHED CABLES CONFORMING TO IS : 1554 (PART I) AMENDED UPTO DATE

Nominal Cross Sectional Area	Nominal Thickness of Insula-tion	Nominal Thickness of Inner Sheath	Armour		Minimum Thickness of Outer Sheath	Approx. Overall Diameter	Approx. Weight of Cable	Max. Dc Conductor Resistance at 20°C	Current Ratings		
			Galv. Round Steel Wire Nominal Dia.	Galv. Flat Steel Strip Nominal Thickness					Direct In Ground	In Ducts	In Air
Sq. mm	mm	mm	mm	mm	mm	mm	Kgs./Km	Ohm/Km	Amps.	Amps.	Amps.
*1.5	0.8	0.3	1.4	-	1.24	15.0	440	12.100	21	17	17
*2.5	0.9	0.3	1.4	-	1.24	16.5	550	7.410	27	24	24
*4.0	1.0	0.3	1.4	-	1.24	18.0	650	4.610	36	30	30
*6.0	1.0	0.3	1.4	-	1.24	19.5	800	3.080	45	38	39
*10	1.0	0.3	-	0.8	1.40	20.0	910	1.830	60	50	52
16	1.0	0.3	-	0.8	1.40	23.0	1150	1.150	77	64	66
25	1.2	0.3	-	0.8	1.40	24.0	1570	0.727	99	81	90
35	1.2	0.3	-	0.8	1.40	27.0	2035	0.524	120	99	110
50	1.4	0.4	-	0.8	1.56	31.0	2780	0.387	145	125	135
70	1.4	0.4	-	0.8	1.56	35.0	3540	0.268	175	150	165
95	1.6	0.4	-	0.8	1.72	38.0	4760	0.193	210	175	200
120	1.6	0.5	-	0.8	1.88	42.0	5770	0.153	240	195	230
150	1.8	0.5	-	0.8	1.88	46.0	7065	0.124	270	225	265
185	2.0	0.6	-	0.8	2.04	51.0	8580	0.099	300	255	305
240	2.2	0.6	-	0.8	2.36	58.0	11000	0.075	345	295	355
300	2.4	0.7	-	0.8	2.52	66.0	13625	0.060	385	335	400
400	2.6	0.7	-	0.8	2.84	80.0	17750	0.047	425	360	455

* If required, these sizes can be offered with standard conductors also

TABLE-20 "POLYCAB" 1.1 KV FOUR CORE, COPPER CONDUCTOR, PVC INSULATED, INNER SHEATHED,

UNARMOURED PVC SHEATHED CABLES CONFORMING TO IS : 1554 (PART I) AMENDED UPTO DATE

Nominal Cross Sectional Area	Nominal Thickness of Insulation	Nominal Thickness of Inner Sheath	Nominal Thickness of Outer Sheath	Approx. Overall Diameter	Approx. Weight of Cable	Max. Dc Conductor Resistance at 20° C	Current Ratings		
							Direct In Ground	In Ducts	In Air
Sq. mm	mm	mm	mm	mm	Kgs./Km	Ohm/Km	Amps.	Amps.	Amps.
*1.5	0.8	0.3	1.8	12.5	190	12.100	21	17	17
*2.5	0.9	0.3	1.8	14.0	245	7.410	27	24	24
*4.0	1.0	0.3	1.8	15.5	320	4.610	36	30	30
*6.0	1.0	0.3	1.8	17.0	410	3.080	45	38	39
*10	1.0	0.3	1.8	19.0	590	1.830	60	50	52
16	1.0	0.3	2.0	21.5	860	1.150	77	64	66
25	1.2	0.3	2.0	24.0	1220	0.727	99	81	90
35	1.2	0.3	2.0	26.5	1670	0.524	120	99	110
50	1.4	0.4	2.2	32.5	2340	0.387	145	125	135
70	1.4	0.4	2.2	33.5	3140	0.268	175	150	165
95	1.6	0.4	2.4	38.5	4210	0.193	210	175	200
120	1.6	0.5	2.4	41.5	5220	0.153	240	195	230
150	1.8	0.5	2.6	46.0	6470	0.124	270	225	265
185	2.0	0.6	2.6	50.5	7980	0.099	300	255	305
240	2.2	0.6	3.0	58.0	10250	0.075	345	295	355
300	2.4	0.7	3.4	64.0	12730	0.060	385	335	400
400	2.6	0.7	3.6	72.0	16800	0.047	425	360	455

* If required, these sizes can be offered with stranded conductors also

TABLE-21 "POLYCAB" 1.1 KV, ANNEALED HIGH CONDUCTIVITY SOLID COPPER CONDUCTOR, 1.5 SQ.MM

PVC INSULATED, INNER SHEATHED, ARMOURED / UNARMOURED PVC SHEATHED CONTROL CABLES
CONFORMING TO IS : 1554 (PART I) AMENDED UPTO DATE

Number of Cores	Nominal Thickness of Insula-tion	Min. Thick-ness of Inner Sheath	Armour		Nominal Sheath Thickness Unar-moured	Minimum Sheath Thickness Armoured	Approx. Overall Diameter		Approx. Weight of Cable		Max. Dc Conductor Resistance at 20°C	Current Ratings		
			Galv. Round Steel Wire Nom. Dia	Galv. Flat Steel Strip Nom. Thick			Unar-moured	Ar-moured	Unar-moured	Ar-moured		Direct In Ground	In Ducts	In Air
	mm	mm	mm	mm	mm	mm	mm	mm	Kgs./Km	Kgs./Km	Ohm/Km	Amps.	Amps.	Amps.
2	0.8	0.3	1.4	-	1.80	1.24	10.50	13.50	130	350	12.1	23	20	20
3	0.8	0.3	1.4	-	1.80	1.24	11.00	14.00	160	400	12.1	21	17	17
4	0.8	0.3	1.4	-	1.80	1.24	11.50	15.00	190	450	12.1	21	17	17
5	0.8	0.3	1.4	-	1.80	1.24	12.50	15.50	225	500	12.1	21	17	17
6	0.8	0.3	1.4	-	1.80	1.24	13.00	16.00	250	550	12.1	15	13	13
7	0.8	0.3	1.4	-	1.80	1.24	13.50	16.50	265	565	12.1	14	13	13
10	0.8	0.3	1.4	-	1.80	1.40	16.50	19.00	350	750	12.1	13	11	11
12	0.8	0.3	-	0.8	1.80	1.24	17.50	19.50	400	650	12.1	12	10	10
14	0.8	0.3	-	0.8	1.80	1.40	18.00	20.00	450	760	12.1	11	10	10
16	0.8	0.3	-	0.8	1.80	1.40	19.50	21.00	500	800	12.1	11	9	9
19	0.8	0.3	-	0.8	2.00	1.40	20.00	22.00	600	850	12.1	10	9	9
24	0.8	0.3	-	0.8	2.00	1.40	23.00	25.00	725	1050	12.1	9	8	8
30	0.8	0.3	-	0.8	2.00	1.40	24.50	26.50	860	1200	12.1	9	7	7
37	0.8	0.3	-	0.8	2.00	1.40	26.00	28.00	1050	1400	12.1	8	7	7
61	0.8	0.4	-	0.8	2.20	1.56	33.00	35.00	1650	2100	12.1	7	6	6

TABLE-22 "POLYCAB" 1.1 KV, ANNEALED HIGH CONDUCTIVITY SOLID COPPER CONDUCTOR, 2.5 SQ.MM

PVC INSULATED, INNER SHEATHED, ARMOURED / UNARMOURED PVC SHEATHED CONTROL CABLES
CONFORMING TO IS : 1554 (PART I) AMENDED UPTO DATE

Number of Cores	Nominal Thickness of Insula-tion	Min. Thick-ness of Inner Sheath	Armour		Nominal Sheath Thickness Unar-moured	Minimum Sheath Thickness Armoured	Approx. Overall Diameter		Approx. Weight of Cable		Max. Dc Conductor Resistance At 20°C	Current Ratings		
			Galv. Round Steel Wire Nom. Dia	Galv. Flat Steel Strip Nom. Thick			Unar-moured	Ar-moured	Unar-moured	Ar-moured		Direct In Ground	In Ducts	In Air
	mm	mm	mm	mm	mm	mm	mm	mm	Kgs./Km	Kgs./Km	Ohm/Km	Amps.	Amps.	Amps.
2	0.9	0.3	1.4	-	1.8	1.24	11.00	14.50	160	425	7.41	32	27	27
3	0.9	0.3	1.4	-	1.8	1.24	11.50	15.50	225	475	7.41	27	24	24
4	0.9	0.3	1.4	-	1.8	1.24	11.50	16.50	250	530	7.41	27	24	24
5	0.9	0.3	1.4	-	1.8	1.24	14.00	17.50	300	600	7.41	27	24	24
6	0.9	0.3	1.4	-	1.8	1.24	15.50	18.50	340	675	7.41	20	18	18
7	0.9	0.3	1.4	-	1.8	1.24	15.50	18.50	375	700	7.41	20	17	17
10	0.9	0.3	-	0.8	1.8	1.40	19.00	21.00	500	780	7.41	18	15	15
12	0.9	0.3	-	0.8	2.0	1.40	20.00	22.00	600	850	7.41	17	14	14
14	0.9	0.3	-	0.8	2.0	1.40	21.00	23.00	650	950	7.41	16	13	13
16	0.9	0.3	-	0.8	2.0	1.40	22.00	24.00	750	1050	7.41	15	13	13
19	0.9	0.3	-	0.8	2.0	1.40	23.00	25.00	850	1150	7.41	14	12	12
24	0.9	0.3	-	0.8	2.0	1.40	27.00	29.00	1050	1400	7.41	13	11	11
30	0.9	0.3	-	0.8	2.0	1.56	28.50	30.50	1250	1700	7.41	12	10	10
37	0.9	0.4	-	0.8	2.2	1.56	31.00	33.00	1550	2000	7.41	11	10	10
61	0.9	0.4	-	0.8	2.2	1.56	38.50	41.00	2450	3100	7.41	9	8	8

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TABLE-23 CONDUCTOR RESISTANCE OF PLAIN COPPER CONDUCTORS

USED FOR HEAVY DUTY CABLES AS PER IS : 8130-1984

Size in sq.mm	Conductor Construction	Max.cond. resistance in Ohm/Km at 20°C Single Core & Multi Core	Size in sq.mm	Conductor Construction	Max. cond. resistance in Ohm/Km at 20°C Single Core & Multi Core
1.5*	1/1.38	12.100	120	37/2.03	0.153
2.5*	1/1.78	7.410	150	37/2.24	0.124
4.0*	1/2.24	4.610	185	37/2.50	0.099
6.0*	1/2.76	3.080	240	61/2.24	0.075
10.0	7/1.35	1.830	300	61/2.50	0.060
16.0	7/1.70	1.150	400	61/2.85	0.047
25.0	7/2.14	0.727	500	61/3.20	0.037
35.0	7/2.50	0.524	630	91/3.00	0.028
50.0	7/3.00	0.387	-	-	-
70.0	19/2.14	0.268	800	127/2.83	0.022
95.0	19/2.50	0.193	1000	127/3.16	0.018

TABLE-24 CURRENT RATING OF '"POLYCAB" COPPER ARMOURED / UNARMOURED CABLES

650 / 1100 V GRADE IN AIR.

Area	Twin Core	3, 3 $^1/_2$, 4 Core	Area	Twin Core	3, 3 $^1/_2$, 4 Core
sq.mm	Amp.	Amp.	sq.mm	Amp.	Amp.
1.5	20	17	70	195	165
2.5	27	24	95	230	200
4.0	35	30	120	265	235
6.0	45	39	150	305	265
10.0	60	52	185	350	305
16.0	78	66	240	410	355
25.0	105	90	300	465	400
35.0	125	110	400	530	455
50.0	155	135	-	-	-

TABLE-25 ESTIMATED A.C RESISTANCE, REACTANCE, CAPACITANCE, IMPEDANCE, VOLTAGE DROP AND SHORTCIRCUIT RATING FOR PVC INSULATED, ALUMINIUM CONDUCTOR, ARMOURED SINGLE CORE CABLES.

Nominal area of Conductor	A.C Resistance at 70°C	Reactance at 50 Hz	Capacitance	Impedance at 70°C	Voltage Drop	Short circuit ratings of conductor for 1 second thickness of Outersheath
mm²	Ohm/Km	Ohm/Km	µF/Km	Ohm/Km	V/Km/A	kA
16	2.3000	0.1250	0.81	2.3000	3.980	1.22
25	1.4400	0.1200	0.83	1.4500	2.510	1.90
35	1.0400	0.1140	0.95	1.0500	1.820	2.66
50	0.7700	0.1120	0.95	0.7780	1.350	3.80
70	0.5330	0.1040	1.13	0.5430	0.940	5.32
95	0.3850	0.0970	1.17	0.3970	0.688	7.22
120	0.3050	0.0926	1.32	0.3180	0.552	9.12
150	0.2480	0.0916	1.30	0.2650	0.459	11.41
185	0.1980	0.0895	1.35	0.2170	0.377	14.07
240	0.1520	0.0876	1.40	0.1750	0.303	18.25
300	0.1220	0.0863	1.44	0.1500	0.259	22.81
400	0.0961	0.0845	1.48	0.1280	0.222	30.41
500	0.0761	0.0835	1.47	0.1130	0.196	38.02
630	0.0606	0.0833	1.45	0.1030	0.178	47.90
800	0.0495	0.0816	1.61	0.0954	0.165	60.83
1000	0.0416	0.0797	1.81	0.0899	0.156	76.03

TABLE-26 ESTIMATED A.C RESISTANCE, REACTANCE, CAPACITANCE, IMPEDANCE, VOLTAGE DROP AND SHORT CIRCUIT RATING FOR PVC INSULATED, ALUMINIUM CONDUCTOR, ARMOURED MULTI CORE CABLES.

Nominal area of Conductor	A.C Resistance at 70°C	Reactance at 50 Hz	Capacitance	Impedance at 70°C	Voltage Drop	Short circuit ratings of conductor for 1 second thickness of Outersheath
mm²	Ohm/Km	Ohm/Km	µF/Km	ohm/Km	V/Km/A	kA
1.5	21.7000	0.1120	0.38	21.700	37.700	0.11
2.5	14.5000	0.1100	0.41	14.500	25.200	0.19
4.0	8.9000	0.1050	0.45	8.900	15.400	0.30
6.0	5.5400	0.0988	0.52	5.540	9.600	0.46
10.0	3.7000	0.0938	0.60	3.700	6.410	0.76
16.0	2.3000	0.0862	0.80	2.300	3.980	1.22
25.0	1.4400	0.0854	0.84	1.440	2.500	1.90
35.0	1.0400	0.0827	0.96	1.050	1.810	2.66
50.0	0.7700	0.0825	0.98	0.775	1.340	3.80
70.0	0.5330	0.0771	1.12	0.538	0.932	5.32
95.0	0.3850	0.0767	1.16	0.393	0.680	7.22
120.0	0.3050	0.0744	1.28	0.314	0.543	9.12
150.0	0.2490	0.0745	1.26	0.259	0.449	11.41
185.0	0.1980	0.0744	1.28	0.212	0.367	14.07
240.0	0.1520	0.0740	1.31	0.169	0.293	18.25
300.0	0.1220	0.0732	1.35	0.142	0.247	22.81
400.0	0.0961	0.0727	1.40	0.121	0.209	30.41

TABLE-27 ESTIMATED A.C RESISTANCE, REACTANCE, CAPACITANCE, IMPEDANCE, VOLTAGE DROP AND SHORT CIRCUIT RATING FOR HR PVC INSULATED, ALUMINIUM CONDUCTOR, ARMOURED SINGLE CORE CABLES.

Nominal area of Conductor	A.C Resistance at 85°C	Reactance at 50 Hz	Capacitance	Impedance at 85°C	Voltage Drop	Short circuit ratings of conductor for 1 second thickness of Outersheath
mm²	Ohm/Km	Ohm/Km	µF/Km	Ohm/Km	V/Km/A	kA
16	2.4100	0.1250	0.81	2.4100	4.180	1.01
25	1.5100	0.1200	0.83	1.5200	2.630	1.72
35	1.0100	0.1140	0.95	1.1000	1.910	2.40
50	0.8090	0.1120	0.95	0.8170	1.410	3.43
70	0.5590	0.1040	1.13	0.5690	0.985	4.80
95	0.4040	0.0970	1.17	0.4160	0.720	6.52
120	0.3200	0.0926	1.32	0.3330	0.577	8.23
150	0.2610	0.0916	1.30	0.2760	0.479	10.29
185	0.2080	0.0895	1.35	0.2260	0.392	12.69
240	0.1590	0.0876	1.40	0.1820	0.315	16.46
300	0.1280	0.0863	1.44	0.1540	0.267	20.58
400	0.1010	0.0845	1.48	0.1310	0.228	27.44
500	0.0796	0.0835	1.47	0.1150	0.200	34.30
630	0.0632	0.0833	1.45	0.1050	0.181	43.21
800	0.0515	0.0816	1.61	0.0964	0.167	54.88
1000	0.0431	0.0797	1.81	0.0906	0.157	68.59

TABLE-28 ESTIMATED A.C RESISTANCE, REACTANCE, CAPACITANCE, IMPEDANCE, VOLTAGE DROP AND SHORT CIRCUIT RATING FOR HR PVC INSULATED, ALUMINIUM CONDUCTOR, ARMOURED MULTI CORE CABLES.

Nominal area of Conductor	A.C Resistance at 85°C	Reactance at 50 Hz	Capacitance	Impedance at 85°C	Voltage Drop	Short circuit ratings of conductor for 1 second thickness of Outersheath
mm²	Ohm/Km	Ohm/Km	µF/Km	Ohm/Km	V/Km/A	kA
1.5	22.800	0.1120	0.38	22.800	39.600	0.10
2.5	15.300	0.1100	0.41	15.300	26.400	0.17
4.0	9.350	0.1050	0.45	9.350	16.200	0.27
6.0	5.820	0.0988	0.52	5.820	10.100	0.41
10.0	3.890	0.0938	0.60	3.890	6.730	0.69
16.0	2.410	0.0862	0.80	2.410	4.180	1.01
25.0	1.510	0.0854	0.84	1.520	2.630	1.72
35.0	1.010	0.0827	0.96	1.010	1.900	2.40
50.0	0.809	0.0825	0.98	0.813	1.41	3.43
70.0	0.559	0.0771	1.12	0.565	0.978	4.80
95.0	0.404	0.0767	1.16	0.412	0.713	6.52
120.0	0.320	0.0744	1.28	0.329	0.569	8.23
150.0	0.261	0.0745	1.26	0.271	0.470	10.29
185.0	0.208	0.0744	1.28	0.221	0.383	12.69
240.0	0.159	0.0740	1.31	0.176	0.304	16.46
300.0	0.128	0.0732	1.35	0.148	0.256	20.58
400.0	0.101	0.0727	1.40	0.124	0.215	27.44

TABLE-29 ESTIMATED A.C RESISTANCE, REACTANCE, CAPACITANCE, IMPEDANCE, VOLTAGE DROP AND SHORT CIRCUIT RATING FOR PVC INSULATED, COPPER CONDUCTOR, ARMOURED SINGLE CORE CABLES.

Nominal area of Conductor	A.C Resistance at 70°C	Reactance at 50 Hz	Capacitance	Impedance at 70°C	Voltage Drop	Short circuit ratings of conductor for 1 second thickness of Outersheath
mm²	Ohm/Km	Ohm/Km	µF/Km	Ohm/Km	V/Km/A	kA
16	1.3800	0.1250	0.81	1.3800	2.390	1.84
25	0.8700	0.1200	0.83	0.8780	1.520	2.88
35	0.6270	0.1140	0.95	0.6380	1.100	4.03
50	0.4630	0.1120	0.95	0.4770	0.830	5.75
70	0.3210	0.1040	1.13	0.3370	0.585	8.05
95	0.2320	0.0970	1.17	0.2510	0.435	10.93
120	0.1840	0.0926	1.32	0.2060	0.357	13.80
150	0.1500	0.0916	1.30	0.1760	0.304	17.25
185	0.1200	0.0895	1.35	0.1500	0.260	21.28
240	0.0928	0.0876	1.40	0.1280	0.221	27.60
300	0.0751	0.0863	1.44	0.1140	0.198	34.50
400	0.0604	0.0845	1.48	0.1040	0.180	46.00
500	0.0490	0.0835	1.47	0.0968	0.168	57.50
630	0.0401	0.0833	1.45	0.0925	0.160	72.45
800	0.0339	0.0816	1.61	0.0883	0.153	92.00
1000	0.0297	0.0797	1.81	0.0850	0.147	115.00

TABLE-30 ESTIMATED A.C RESISTANCE, REACTANCE, CAPACITANCE, IMPEDANCE, VOLTAGE DROP AND SHORT CIRCUIT RATING FOR PVC INSULATED, COPPER CONDUCTOR, ARMOURED MULTI CORE CABLES.

Nominal area of Conductor	A.C Resistance at 70°C	Reactance at 50 Hz	Capacitance	Impedance at 70°C	Voltage Drop	Short circuit ratings of conductor for 1 second thickness of Outersheath
mm²	Ohm/Km	Ohm/Km	µF/Km	Ohm/Km	V/Km/A	kA
1.5	14.5000	0.1140	0.37	14.500	25.100	0.17
2.5	8.9000	0.1100	0.40	8.900	15.400	0.29
4.0	5.5200	0.1060	0.44	5.520	9.560	0.46
6.0	3.6900	0.1001	0.51	3.690	6.390	0.69
10.0	2.1900	0.0907	0.67	2.190	3.800	1.15
16.0	1.3800	0.0862	0.80	1.380	2.390	1.84
25.0	0.8700	0.0854	0.84	0.870	1.510	2.88
35.0	0.6300	0.0827	0.96	0.630	1.010	4.03
50.0	0.4640	0.0825	0.98	0.471	0.815	5.75
70.0	0.3210	0.0771	1.12	0.331	0.572	8.05
95.0	0.2320	0.0767	1.16	0.244	0.423	10.93
120.0	0.1840	0.0744	1.28	0.199	0.344	13.80
150.0	0.1500	0.0745	1.26	0.168	0.290	17.25
185.0	0.1210	0.0744	1.28	0.142	0.246	21.28
240.0	0.0930	0.0740	1.31	0.119	0.206	27.60
300.0	0.0750	0.0732	1.35	0.105	0.182	34.50
400.0	0.0604	0.0727	1.40	0.095	0.164	46.00

TABLE-31 ESTIMATED A.C RESISTANCE, REACTANCE, CAPACITANCE, IMPEDANCE, VOLTAGE DROP AND SHORT CIRCUIT RATING FOR HR PVC INSULATED, COPPER CONDUCTOR, ARMOURED SINGLE CORE CABLES.

Nominal area of Conductor	A.C Resistance at 85°C	Reactance at 50 Hz	Capacitance	Impedance at 85°C	Voltage Drop	Short circuit ratings of conductor for 1 second thickness of Outersheath
mm²	Ohm/Km	Ohm/Km	µF/Km	Ohm/Km	V/Km/A	kA
16	1.4400	0.1250	0.81	1.4500	2.510	1.66
25	0.9130	0.1200	0.83	0.9210	1.590	2.59
35	0.6580	0.1140	0.95	0.6680	1.160	3.63
50	0.4860	0.1120	0.95	0.4990	0.864	5.19
70	0.3370	0.1040	1.13	0.3530	0.611	7.26
95	0.2430	0.0970	1.17	0.2620	0.453	9.86
120	0.1930	0.0926	1.32	0.2140	0.371	12.45
150	0.1570	0.0916	1.30	0.1820	0.315	15.57
185	0.1260	0.0895	1.35	0.1550	0.268	19.20
240	0.0971	0.0876	1.40	0.1310	0.226	24.91
300	0.0785	0.0863	1.44	0.1170	0.202	31.13
400	0.0630	0.0845	1.48	0.1050	0.183	41.51
500	0.0509	0.0835	1.47	0.0978	0.169	51.89
630	0.0416	0.0833	1.45	0.0931	0.161	65.38
800	0.0351	0.0816	1.61	0.0888	0.154	83.02
1000	0.0306	0.0797	1.81	0.0853	0.148	103.78

TABLE-32 ESTIMATED A.C RESISTANCE, REACTANCE, CAPACITANCE, IMPEDANCE, VOLTAGE DROP AND SHORT CIRCUIT RATING FOR HR PVC INSULATED, COPPER CONDUCTOR, ARMOURED MULTI CORE CABLES.

Nominal area of Conductor	A.C Resistance at 85°C	Reactance at 50 Hz	Capacitance	Impedance at 85°C	Voltage Drop	Short circuit ratings of conductor for 1 second thickness of Outersheath
mm²	Ohm/Km	Ohm/Km	µF/Km	Ohm/Km	V/Km/A	kA
1.5	15.2000	0.1140	0.37	15.2000	26.300	0.16
2.5	9.3000	0.1100	0.40	9.3000	16.100	0.26
4.0	5.7900	0.1060	0.44	5.7900	10.000	0.42
6.0	3.8700	0.1001	0.51	3.8700	6.700	0.62
10.0	2.3000	0.0907	0.67	2.3000	3.980	1.04
16.0	1.4400	0.0862	0.80	1.4500	2.510	1.66
25.0	0.9130	0.0854	0.84	0.9170	1.590	2.59
35.0	0.6580	0.0827	0.96	0.6630	1.150	3.63
50.0	0.4860	0.0825	0.98	0.4930	0.854	5.19
70.0	0.3370	0.0771	1.12	0.3460	0.599	7.26
95.0	0.2430	0.0767	1.16	0.2550	0.442	9.86
120.0	0.1930	0.0744	1.28	0.2070	0.359	12.45
150.0	0.1570	0.0745	1.26	0.1740	0.301	15.57
185.0	0.1260	0.0744	1.28	0.1470	0.254	19.20
2400.	0.0972	0.0740	1.31	0.1220	0.212	24.91
300.0	0.0787	0.0732	1.35	0.1070	0.186	31.13
400.0	0.0630	0.0727	1.40	0.0962	0.167	41.51

1) FOR AIR AND GROUND TEMPERATURE

A. Rating factors for variation in ambient air temperature						
Ambient Temp (°C)	25	30	35	40	45	50
Rating Factors	1.25	1.16	1.09	1.00	0.90	0.80

B. Rating factors for variation in ground temperature							
Ground Temp (°C)	15	20	25	30	35	40	45
Rating Factors	1.17	1.12	1.06	1.00	0.94	0.87	0.79

C. Rating factors for variation in ground temperature (for Cables in Ducts)							
Ground Temp (°C)	15	20	25	30	35	40	45
Rating Factors	1.17	1.12	1.06	1.00	0.94	0.87	0.79

2) FOR DEPTH OF LAYING (CABLES LAID DIRECT IN THE GROUND).

Depth of laying	Size		
Cm	Upto 25 mm^2	Above 25 mm2 Upto 300 mm^2	Above 300 mm^2
75	1.00	1.00	1.00
90	0.99	0.98	0.97
105	0.98	0.97	0.96
120	0.97	0.96	0.95
150	0.96	0.94	0.92
180 or more	0.95	0.93	0.91

3) FOR VARIATION IN THERMAL RESISTIVITY OF SOIL (TWO AND THREE AND MULTICORE CABLES LAID DIRECT IN THE GROUND).

Nominal area of conductor mm^2	Two cables touching for values of Thermal Resistivity of soil in °C cm / W					
	100	120	150	200	250	300
1.5	1.10	1.05	1.00	0.92	0.86	0.81
2.5	1.10	1.05	1.00	0.92	0.86	0.81
4.0	1.10	1.05	1.00	0.92	0.86	0.81
6.0	1.10	1.05	1.00	0.92	0.86	0.81
10.0	1.10	1.06	1.00	0.92	0.85	0.80
16.0	1.12	1.06	1.00	0.91	0.84	0.79
25.0	1.14	1.08	1.00	0.91	0.84	0.78
35.0	1.15	1.08	1.00	0.91	0.84	0.77
50.0	1.15	1.08	1.00	0.91	0.84	0.77
70.0	1.15	1.08	1.00	0.90	0.83	0.76
95.0	1.15	1.08	1.00	0.90	0.83	0.76
120.0	1.17	1.09	1.00	0.90	0.82	0.76
150.0	1.17	1.09	1.00	0.90	0.82	0.75
185.0	1.18	1.09	1.00	0.89	0.81	0.75
240.0	1.18	1.09	1.00	0.89	0.81	0.75
300.0	1.18	1.09	1.00	0.89	0.81	0.75
400.0	1.19	1.10	1.00	0.89	0.81	0.75

FOR SINGLE CORE CABLES

A) Cables laid direct in the ground in horizontal formation.

No. of Trefoils in Group	Distance between Trefoils			
	Touching	15 cm	30 cm	45 cm
2	0.78	0.81	0.85	0.88
3	0.68	0.71	0.77	0.81
4	0.61	0.65	0.72	0.76
5	0.56	0.61	0.68	0.73

B) Cables laid in ducts in horizontal formation.

No. of Trefoils in Group	Distance between Trefoils		
	Touching	45 cm	60 cm
2	0.87	0.90	0.91
3	0.79	0.83	0.86
4	0.74	0.79	0.82
5	0.71	0.76	0.80

C) Cables laid on racks / Trays in covered trench with having restricted air circulation, Trefoils are separated by two cable diameter horizontally and the trays are in tiers having 30 cm distance.

No. racks / trays in tiers	No. of Trefoils in Horizontal Formation		
	1	2	3
1	0.95	0.90	0.88
2	0.90	0.85	0.83
3	0.88	0.83	0.81
6	0.86	0.81	0.79

D) as above C. but cables laid in open air.

No. racks / trays in tiers	No. of Trefoils in Horizontal Formation		
	1	2	3
1	1	0.98	0.96
2	1	0.95	0.93
3	1	0.94	0.92
6	1	0.93	0.90

FOR MULTI CORE CABLES

A) Cables laid on cable trays exposed to air, the cables spaced by one cable diameter and trays are in tiers spaced by 30 cm. The clearance between the wall and the cable is 25 mm.

No. of cables trays in tier	No. of Cables per Tray				
	1	2	3	6	9
1	1	0.98	0.96	0.93	0.92
2	1	0.95	0.93	0.90	0.89
3	1	0.94	0.92	0.89	0.88
6	1	0.93	0.90	0.87	0.86

B) Cables laid inside concrete trench with removable covers on cable trays having restricted circulation. The cables spaced by one cable diameter and trays are in tiers spaced by 30 cm. The clearance of the cable from the wall is 25 mm.

No. of cables trays in tier	No. of Cables per Tray				
	1	2	3	6	9
1	0.95	0.90	0.88	0.85	0.84
2	0.90	0.85	0.83	0.81	0.80
3	0.88	0.83	0.81	0.79	0.78
6	0.86	0.81	0.79	0.77	0.76

C) Cables laid on cable trays exposed to air, the cable touching and trays are in tiers spaced by 30 cm. The clearance between the wall and the cable is 25 mm.

No. of cables trays in tier	No. of Cables per Tray				
	1	2	3	6	9
1	1	0.84	0.80	0.75	0.73
2	1	0.80	0.76	0.71	0.69
3	1	0.78	0.74	0.70	0.68
6	1	0.76	0.72	0.68	0.66

D) Cables laid direct in ground in horizontal formation.

No. of cables in Group	Distance of Cables			
	Touching	15 cm	30 cm	45 cm
2	0.79	0.82	0.87	0.90
3	0.69	0.75	0.79	0.83
4	0.62	0.69	0.74	0.79
5	0.58	0.65	0.72	0.76
6	0.54	0.61	0.69	0.75

E) Cables laid in single way ducts / pipes in horizontal formation.

No. of cables in Group	Distance of Cables			
	Touching	30 cm	45 cm	60 cm
2	0.88	0.90	0.92	0.94
3	0.82	0.84	0.87	0.89
4	0.77	0.80	0.84	0.87
5	0.74	0.78	0.82	0.85
6	0.71	0.76	0.81	0.84

Power Cables are generally selected considering the application. However, following factors are important for selection of suitable cable construction required to transport electrical energy from one end to the other.

1) Maximum operating voltage,
2) Fault Level,
3) Load to be carried,
4) Possible overloading duration & magnitude,
5) Route length and voltage drop.
6) Mode of installation considering install-lation environment such as ambient & ground temperature chemical & physical properties of soil.
7) Flame retardant properties.

All sizes of POLYCAB PVC cables are designed to standard operating conditions in India and abroad. The standards adopted are considering the geographical/ climatical conditions and general applications of power for utilities, distribution and generation purposes.

The cables are manufactured conforming to Indian & International cables specifications for PVC Insulated cables. Customer specific requirements can also be met.

Flame Retardant Low Smoke Cables

The behaviour of Electric Cables in presence of fire has been a matter of great concern to all Electrical Engineers involved in Generation, Transmission and Utilisation of electric power. Normally all XLPE / PVC Cables have an outer sheath of PVC. Although PVC by itself is flame retarding, it does produce highly toxic and corrosive fumes in the event of fire.

As a matter of fact, in closed and crowded places such as power stations, subways, railways with long sections in tunnels, road tunnels, ships, hospitals, schools, hotels, cinema theatres, museums and public premises in general, besides the obvious danger represented by fire propagation, also fume toxicity and opacity are particularly important as they may cause, with equally serious consequences for human safety, suffocation intoxication and panic due to reduced visibility.

FRLS PVC compound should ensure the following :

1) Minimum smoke emission.
2) Very low toxic and corrosive fumes emission.
3) Fire Retardant characteristics.

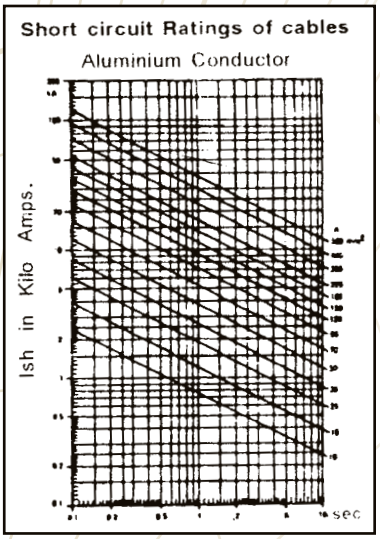
Our laboratory is well equipped with latest test equipments to carry out following test requirements.

a) The oxygen index and temperature index of sheath as per ASTM-D 2863.
b) Flammability characteristics of cable as per IEC-332 (Pt. I) & IEC-332 (Pt. III)
c) Flammability characteristics of cables as per Swedish Standard SS 424 14 75, Class F3.
d) Determination of the amount of halogen acid gas evolved during combustion of outersheath materials as per per IEC 754 (Pt. I).
e) Determination of smoke generation of outersheath material under fire as per ASTM-D 2843
f) The measurement of smoke density as per IEC 61034.

Normal current rating of POLYCAB cable as given in the tables takes into account temporary overloading which often occurs in use. However, to safeguard against excessive thermal damage, it is essential that protective switchgear of a proper rating is used in circuit.

Cables laid in air or in ducts can safely be overloaded to 1.5 times the amount given in the current rating tables for four hours provided the protective system uses a class P fuse designed to operate at a 50% overload.

In case the protective circuit has a different fuse rating, select a cable by multiplying the tripping current by 0.67 to arrive at a suitable size of cable. For example, for carrying 200 amps current in the air 70 sq.mm. single core cable is suitable (current rating is 230 amps.) This cable can therefore be overloaded to the extent of 230 x 1.5 = 345 amp. provided that the protective fuse rating is 230 x 1.5 = 345. However, if the protective fuse rating is 400 amps. normal rating 400 x .67 = 268 amps., 95 sq. mm cable should be used. Similarly current rating for cables in the ground can safely used for an overload factor of 1.3 for four hours. It is essential that the protection is designed to operate at a 30% overload. In case this is different, select a cable to carry 0.77 times the current at which protection is designed to operate.



SHORT CIRCUIT RATING FOR ALUMINIUM CONDUCTOR CABLES

With a high increase in KVA capacity of the power distribution system, cable are expected to carry short circuit currents of high magnitude. Normally rated at 70° C, our insulating materials permit a short circuit temperature of 160° C. With the high interrupting capacity expected of a cable under short circuit, it is essential that protective fuses in the system are designed to minimise the duration as far as possible. Short circuit rating of a cable can be calculated as under

$$\text{Where Ish} = \frac{75.8 \times A}{\sqrt{t}}$$

Ish : Short circuit current in r. m. s. amps.
t : Duration of short circuit in seconds.
A : Area of conductor in sq. mm

Constants are tabulated below for different duration of short circuit.

Duration of short circuit in seconds	1 cycle =0.02 seconds	2 cycle =0.04 seconds	5 cycle =0.01 seconds	10 cycle =0.02 seconds	25 cycle =0.02 seconds	50 cycle =0.02 seconds	2 seconds	3 seconds	4 seconds	5 seconds
Short circuits constant per unit area	536	378	239	169	107	75.7	53.0	43.6	37.8	34.0

Example : Short circuit rating of 150 sq.mm. conductor area with a short circuit duration of 0.5 seconds = 150 x 107 = 16050 amps.

SHORT CIRCUIT RATING FOR COPPER CONDUCTOR CABLES

The following formula gives the Short Circuit Rating of Copper conductor, PVC insulated cables

$$\text{Where Ish} = \frac{113 \times A}{\sqrt{t}}$$

Ish : Short circuit current in r. m. s. amps.
t : Duration of short circuit in seconds.
A : Area of conductor in sq. mm

POLYCAB WIRES & CABLES
AN ISO 9001:2000 COMPANY

A. CABLE INSPECTION

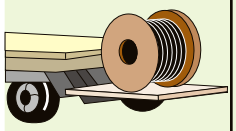
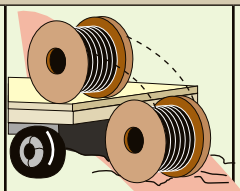
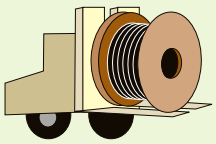
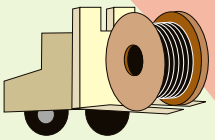
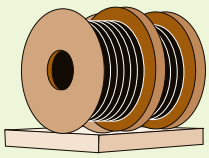
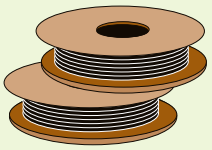
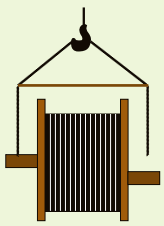
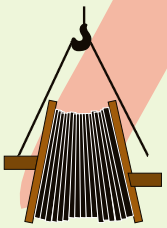
Inspect every cable reel for damage before accepting the shipment.Be particularly alert for cable damage if:

1. A reel is lying flat on its side
2. Several reels are stacked
3. Other freight is stacked on a reel
4. Nails have been driven into reel flanges to secure shipping blocks
5. A reel flange is damaged
6. A cable covering is removed, stained or damaged
7. A cable end seal is removed or damaged. A reel has been dropped (hidden damage likely)

B. CABLE HANDLING & STORAGE

Damage to cables can occur due to the incorrect handling to which the drums and cables may be subjected; causing breakdown of the drum flanges and in exceptional cases, movement of the drum barrel takes place. Once this breakdown of the drum occurs, the cable is immediately exposed to damage. Cables damaged during handling & storage can cause service failures when the subject cable is put to use.

Thus the following is a list of Do's and Don'ts that should be followed while handling and storing the cables before it is put to use.

Do's		Don'ts	
	When off loading reels from a truck, lower reels carefully using a hydraulic gate, hoist or forklift truck		Never drop reels. If reels must be rolled, roll in opposite direction of the cable wraps to keep cable from loosening on the reel.
	If a fork lift is used, approach the reel from the flange side. Position the forks such that the reel is lifted by both reel flanges. Also Consideration should be given to, Traffic patterns during off-loading & damage during the time in storage		Do not allow the lift forks to contact the cable. Care must be taken by the fork lift operator not to make sudden turns or stops.
	Cable reels should be stored on hard surfaces resting on the flanges edge (flanges vertical). Align reels flange to flange and, if possible, arrange so that first in is first out.		Multiple reels stacked on top of each other ("Pancake" storage) is not recommended for cable drums. The weight of the stack can total thousands of kgs. creating an enormous load on the bottom reel. Also, damage to the reel and/or cable will likely occur when the reel is flipped for transit. A concentration of stress on the reel flange may cause it to break and subsequently damage the cable.
	When using a hoist, install a mandrel through the reel arbor holes and attach a sling. Use a spreader bar approximately 6 inches longer than the overall reel width placed between the sling ends just above the reel flanges.		This may lead to the bending of the reel flanges and mashing the cable

C. PRE- INSTALLATION

To ensure safety during cable installation, following shall be checked prior to installation.

1. The cable selected is proper for designed application.
2. The cable has not been damaged in transit or storage.

Review all applicable state and national codes to verify that the cable chosen is appropriate for the job. Also consult your local electricity authority. Next, you must identify any existing cable damage and prevent any further damaged from occurring. This is done through proper cable inspection, handling and storage.

D. INSTALLATION & LAYING

Mechanical stresses during installation are generally more severe than those encountered while in service. Thus care should be taken as regards to the following while installation and laying of cables.

1. Polycab recommend the laying and installation of cables as per IS: 1255/84.
2. Care shall be taken during laying to avoid sharp bending, and twisting.
3. Cable shall be un wound from the drum by lifting the drum on the center
4. Shaft supported both ends with suitablejacks / stands.
5. Under no circumstances the cable winding shall be lifted off a coil or drum lying flat at the flanges. This would cause serious twist and damages.
6. Suitable protection shall be provided to the cables against mechanical damages, it includes covers, pipes etc.

E. RECOMMENDED MINIMUM BENDING RADIUS FOR HEAVY DUTY CABLES.

Single Core : 20 x D

Multicore : 15 x D

Where D= Diameter of cable in mm

F. RECOMMENDED SAFE PULLING FORCE WITH STOCKINGS:

a) For Unarmoured Cable : P = 5 D2

b) For Armoured Cable : P = 9 D2

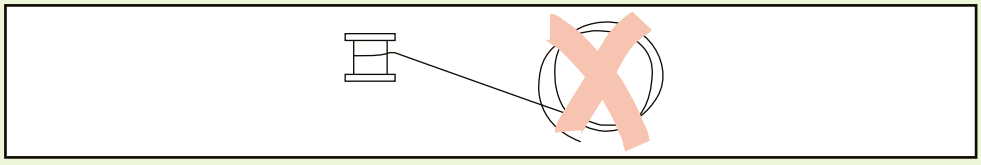
Where P = Pulling Force
Where D = Diameter of cable in mm

G. RECOMMENDED SAFE PULLING FORCE WHEN PULLED WITH PULLING EYE :

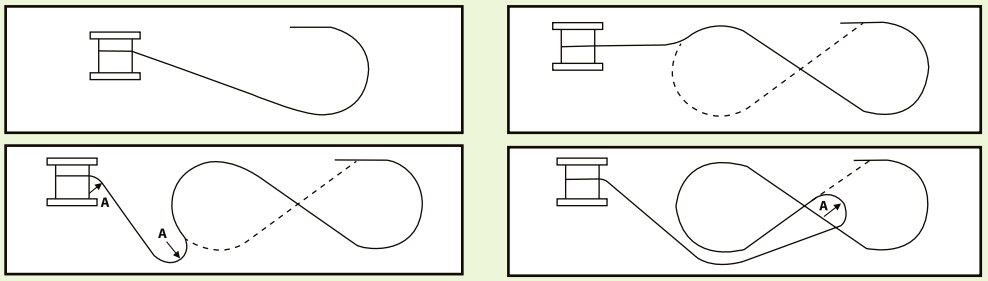
a) For Aluminium Conductor : 30 N/mm^2

b) For Copper Conductor : 50 N/mm^2

DO NOT ATTEMPT "COILING" OF CABLE ON THE GROUND



ON THE GROUND CABLE CAN BE FLAKED IN A FIGURE OF EIGHT FORMATION



Note: R Minimum Permissible bending radius of cable.



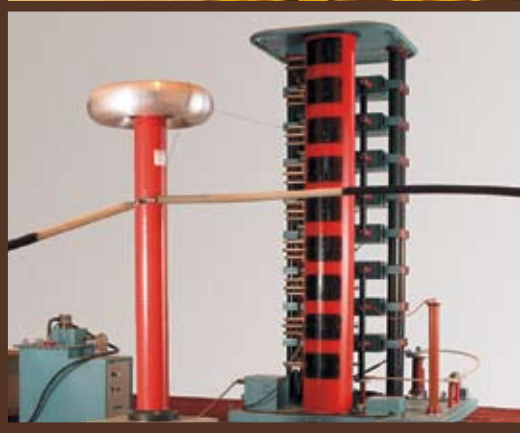












Production Facilities at Daman Factory

POLYCAB REGIONAL OFFICES

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BARODA : 9, Khushbu Corner, 56, Vishwas Colony, Alkapuri, BARODA - 390 005.
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Tel: 0265 3252825 • Fax: 0265 3252825 • Email : pune@polycab.com

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Tel: 080 23102172 • Fax: 080 23102071 • Email : karnataka@polycab.com

SECUNDERABAD : 401, A, Suryakiran Complex, Sarojini Devi Road, SECUNDERABAD - 500 003.
Tel: 040 66326228 • Fax: 040 66326229 • Email : andhra@polycab.com

DELHI : 901-B, 909, 9th Floor, Devika Towers, Nehru Place, NEW DELHI - 110 019.
Tel: 011 26453056/57 • Fax: 011 26453058 • Email : north@polycab.com

KOLKATTA : 1st Floor, 34, Dr. Meghnad Saha Sarani, (Formally Southern Avenue), Kolkata-700 029. • Email: kolkatta@polycab.com

Wiring the World

POLYCAB®
WIRES & CABLES

POLYCAB WIRES PVT. LTD.

(an ISO 9001:2000 Company)

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Fax : 91-22-2432 7075

E-mail : info@polycab.com
Website : www.polycab.com

POLYCAB WIRES PVT LTD

TECHNICAL DETAILS

PVC WIRES & FLEXIBLES

"POLYCAB" PLAIN COPPER CONDUCTOR, PVC INSULATED UNSHEATHED 650 / 1100 V, SINGLE CORE CABLE FOR PANEL BOARD WIRING AS PER IS : 694 / 1990 WITH ISI MARK (UPTO 50 SQ.MM)

AREA IN SQ.MM	CONDUCTOR CONSTRUCTION IN GENERAL	MAX.DC RESISTANCE OHM/KM AT 20 DEGC	INSULATION THICKNESS IN MM	CABLE DIA (APPX.)	CURRENT RATING IN AMP.
0.50	16/0.20	39.00	0.60	2.20	4
0.75	24/0.20	26.00	0.60	2.50	7
1.00	32/0.20	19.50	0.60	2.60	12
1.50	30/0.25	13.30	0.60	2.90	16
2.50	50/0.25	7.98	0.70	3.50	22
4.00	56/0.30	4.95	0.80	4.30	29
6	84/0.30	3.300	0.80	5.30	37
10	140/0.30	1.910	1.00	6.70	51
16	126/0.40	1.210	1.00	8.20	68
25	196/0.40	0.780	1.20	10.00	86
35	276/0.40	0.554	1.20	11.3	110
50	396/0.40	0.386	1.40	13.5	145
NOTE: Cable above **50 sq.mm** are not covered by IS : 694 But are as per IS : 2465					
70	360/0.50	0.272	1.60	15.5	161
95	485/0.50	0.206	1.80	18.5	200
120	608/0.50	0.161	2.00	20.9	225
150	750/0.50	0.129	2.00	22.5	240
185	925/0.50	0.106	2.20	24.6	300
240	1221/0.50	0.0801	2.20	27.6	425
300	1527/0.50	0.0641	2.40	32.2	475
400	2036/0.50	0.0486	2.60	35.7	550

"POLYCAB" PLAIN COPPER CONDUCTOR, PVC INSULATED AND SHEATHED 650 / 1100 V, MULTICORE FLEXIBLE CABLES AS PER IS : 694/1990 WITH ISI MARK

AREA IN SQ.MM	CONSTRUCTION NO./DIA.	COND. DIA. IN MM	MAX. DC RESISTANCE OHM/KM AT 20 DEG.C	INSULATION THICKNESS NOMINAL MM	CORE DIA. MM	SHEATH THICKNESS IN MM NOMINAL			OVERALL DIAMETER IN MM APPROX.			CURRENT RATING AMP.
						2 core	3 core	4 core	2 core	3 core	4 core	
0.50	16/0.2	0.94	39.00	0.60	2.20	0.90	0.90	0.90	6.20	6.60	7.20	4
0.75	24/0.2	1.20	26.00	0.60	2.50	0.90	0.90	0.90	6.80	7.20	7.90	7
1.00	32/0.2	1.34	19.50	0.60	2.60	0.90	0.90	0.90	7.00	7.50	8.10	12
1.50	30/0.25	1.64	13.30	0.60	2.90	0.90	0.90	1.00	7.60	8.10	9.00	16
2.50	50/0.25	2.08	7.98	0.70	3.50	1.00	1.00	1.00	9.00	9.60	10.50	22
4.00	56/0.3	2.61	4.95	0.80	4.30	1.00	1.00	1.00	10.60	11.30	12.40	29

"POLYCAB" PLAIN COPPER CONDUCTOR, PVC INSULATED AND SHEATHED 650 / 1100 V, MULTICORE FLEXIBLE CABLES AS PER IS : 694/1990 WITH ISI MARK

AREA IN SQ.MM	CONSTRUCTION NO./DIA.	COND. DIA. IN MM	MAX. DC RESISTANCE OHM/KM AT 20 DEG.C	INSULATION THICKNESS NOMINAL MM	CORE DIA. MM	SHEATH THICKNESS IN MM NOMINAL			OVERALL DIAMETER IN MM APPROX.			CURRENT RATING AMP.
						2 core	3 core	4 core	2 core	3 core	4 core	
6.00	84/0.3	3.5	3.30	0.80	5.10	1.15	1.15	1.40	12.60	13.40	15.20	37
10.00	140/0.3	4.60	1.91	1.00	6.60	1.40	1.40	1.40	16.00	17.00	18.80	51
16.00	126/0.4	6	1.21	1.00	8.00	1.40	1.40	1.40	18.80	20.10	22.20	68
25.00	196/0.4	7.6	0.78	1.20	10.00	2.00	2.00	2.00	24.00	25.60	28.20	86
35.00	276/0.4	8.7	0.554	1.20	11.10	2.00	2.00	2.00	26.30	28.00	31.00	110
50.00	396/0.4	10.6	0.386	1.40	13.40	2.00	2.00	2.00	30.90	33.00	36.50	145
70.00	360/0.5	12.3	0.272	1.40	15.10	2.00	2.20	2.40	34.20	37.00	41.00	215
95.00	485/0.5	14.7	0.206	1.60	17.90	2.20	2.40	2.40	40.20	43.50	47.80	260

POLYCAB
WIRES & CABLES

"POLYCAB" MULTICORE ROUND FLEXIBLE CABLES (6 CORES TO 19 CORES) GENERALLY AS PER IS : 694/1990

Area Sq.mm		0.50	0.75	1.00	1.50	2.50	4.00
General Construction no./dia		16/0.2	24/0.2	32/0.2	30/0.25	50/0.25	56/0.3
Conductor Dia. In MM		0.94	1.20	1.34	1.64	2.08	2.61
Avg. Insu. Thickness in MM		0.60	0.60	0.60	0.60	0.70	0.80
Core Dia in MM		2.20	2.50	2.60	2.90	3.50	4.30
No. of Cores							
6	Avg. Sheath thickness MM	0.90	1.00	1.00	1.00	1.10	1.20
	App. Overall Dia MM	8.50	9.50	9.80	10.70	12.70	15.30
7	Avg. Sheath thickness MM	0.90	1.00	1.00	1.00	1.10	1.20
	App. Overall Dia MM	8.50	9.50	9.80	10.70	12.70	15.30
8	Avg. Sheath thickness MM	1.00	1.00	1.00	1.10	1.20	1.30
	App. Overall Dia MM	9.30	10.40	10.70	11.90	14.10	16.90
10	Avg. Sheath thickness MM	1.00	1.10	1.10	1.10	1.30	1.40
	App. Overall Dia MM	10.80	12.20	12.60	13.80	16.60	20.00
12	Avg. Sheath thickness MM	1.00	1.10	1.10	1.10	1.30	1.40
	App. Overall Dia MM	11.20	12.60	13.00	14.30	17.20	20.70
14	Avg. Sheath thickness MM	1.10	1.10	1.10	1.20	1.30	1.40
	App. Overall Dia MM	12.00	13.30	13.70	15.20	18.10	21.80
16	Avg. Sheath thickness MM	1.10	1.20	1.20	1.20	1.40	1.50
	App. Overall Dia MM	12.60	14.20	14.60	16.00	19.30	23.20
19	Avg. Sheath thickness MM	1.10	1.20	1.30	1.30	1.40	1.50
	App. Overall Dia MM	13.20	14.90	15.60	17.10	20.30	24.50
24	Avg. Sheath thickness MM	1.20	1.30	1.30	1.40	1.40	1.50
	App. Overall Dia MM	15.60	17.60	18.20	20.20	23.80	28.80
30	Avg. Sheath thickness MM	1.30	1.30	1.30	1.40	1.40	1.50
	App. Overall Dia MM	16.80	18.70	19.30	21.50	25.70	30.60
	Max. Conductor Resistance in Ohm/km at 20 deg.C	39.00	26.00	19.50	13.30	7.98	4.95
	Recommended Current Rating in AMP	4	7	12	16	22	29

AERIAL BUNCHED CABLES

POLYCAB WIRES PVT. LTD.

HICO HOUSE, 1st FLOOR,
PANDIT SATWALEKAR MARG,
MAHIM, MUMBAI – 400 016
TEL: 91-22-24327070, FAX:91-22-24327075
E-mail: polycab@vsnl.com
Internet: www.polycab.com

ABOUT US

From a modest beginning with Conductors, Compounds and Wires & Cables, almost three decades ago, the Polycab Group Set up a State of Art manufacturing facilities at Daman in 1997, to address key market determinants. Starting the project from scratch Polycab was able to design a manufacturing facility around State of Art disciplines of Computer integrated manufacture .The Quality & Manufacturing setup is sourced out from the World renown Machinery and Technology Suppliers with constant upgradations and expansions.

At POLYCAB, We study the requirements of the penultimate users with our commitment for Quality and Value. These are converted into process specifications based on Indian & International Standards.

In an on going effect to improve Customer satisfaction POLYCAB offers a variety of services: -

- **Commercially Competitive Prices.**
- **Reliable & Consistent quality.**
- **Reliable & just in time delivery.**
- **Product development for a changing market**
- **A target stocking policy.**
- **Technical Support for Applications /Projects.**

POLYCAB derives its strengths from its Customers. The Growth of latter is a prerequisite to the growth of the Company and hence Customer satisfaction is its prime Objective. Over the years sincere service and dedication of its Customers has earned the Company distinguished clientele Which includes leaders in Sectors like Utilities, Power Distribution, Oil Refineries, Oem's, EPC Contractors, Steel & Metal, Cement, Petroleum, Chemical, Atomic Energy & Nuclear Power etc. etc.

For any Company the key to establish itself in the export market is QUALITY. Not surprisingly, considering its quality conscious approach towards manufacturing Polycab enjoys a good reputation in the global market.

Now the company has monthly manufacturing capacity to Process over 1500 Tons of Rod Copper & Tinned Copper, 1000 Tons of Alloy & Aluminium and over 800 Tons of fine tinned & Bare Copper Wires, to produce a wide range of Conductors for H.T. & L.T. Power Cables, Control Cables, Instrumentation, House Wires, Flexibles, Submersible & Welding Cables, FS Cables, Aerial Bunched Cables, AAC, AAAC, ACSR Bare and Earthing Conductors.

Our constant efforts to incorporate latest efficiency mechanism in our manufacturing and service are the key factors of "Adding Value through Conductors & Cables". Our plant at Daman offers NIL sales tax to the customers and a wide marketing network to cater domestic and exports requirements.

With offices, personnel, distributors, dealers, stockists throughout the Country, Polycab offers the highest level of Customer Service.

AERIAL BUNCHED CABLES FOR OVERHEAD DISTRIBUTION

INTRODUCTION

Aerial Bunched Cable (ABC) is a very novel concept for Over Head power distribution. When compared to the conventional bare conductor over head distribution system, ABC provides higher safety and reliability, lower power losses and ultimate system economy by reducing installation, maintenance and operative cost. This system is ideal for rural distribution and specially attractive for installation in difficult terrains such as hilly areas, forest areas, coastal areas etc.

ABC is also considered to be the best choice for power distribution congested urban areas with narrow lanes and by-lanes. In developing urban complex, ABC is the better choice because of flexibility for rerouting as demanded by changes in urban development plan.

CONSTRUCTION OF ABC

XLPE/HDPE insulated power conductors of Aluminium (Neutral conductor and street lighting conductors if and when necessary) are laid together (twisted) around a high tensile stranded and galvanized steel (Aluminium Alloy may be used) insulated or bare messenger wire to form the Aerial Bunched Cable. This assembly is directly strung on to distribution pole/towers by means of standard hardwares available in the market but care shall be taken to render the messenger wire completely insulated from earthing at any point of distribution in case of HT ABC.

The XLPE (Cross-linked Polyethylene) insulation is black in colour and is stabilized against deterioration caused by exposure to direct sunlight and ultraviolet radiation. XLPE is cross-linkable low density polyethylene which is made thermoset by special formulation from base polymer of thermoplastic low density polyethylene. XLPE combines the best electrical properties of LDPE and superior thermo mechanical properties.

MATERIALS

(i) Aluminium conductors conform to IS:8130 (Class-II)
(ii) Stranded high tensile galvanized steel messenger wire conforms to IS:398 (Part-2). Alternatively Aluminium Alloy messenger wire conforms to IS:398 (Part-IV)
(iii) XLPE and HDPE insulation of power conductors conform to IS: 7098 (Part I & II) and IS: 6474 respectively.

Since, the tension from the current carrying conductor is totally removed by introduction of messenger wire the operating temperature of the conductor is 90^0 C as against 75^0C of the bare conductor under tension thereby allowing ABC to carry current equivalent to that of bare conductor of the same size.

STRINGING

No difficulty is envisaged during stringing of ABC in the conventional method but care shall be taken that insulated conductors do not get damaged during installation. Dragging the ABC on the ground is to be avoided. Tension to be applied during stringing shall be 25% of the breaking load of the messenger wires. This will allow line to have sag within specified limit of 1.5% of the span at the lowest ambient temperature.

JOINTING

While mid-span jointing permissible for LT ABC system by conventional technique, our recommendation will be to draw the line in such a way as to bring the joints at the supports. Mid-span jointing is not at all recommended in the case of HT lines our recommendation is for outdoor type HV terminations only. Under unavoidable circumstances, line tapping at the support points may be allowed through suitably designed clamp connectors/PG clamps. The semiconducting screen continuity shall be maintained at all joints as far as possible to avoid fluctuations during system disturbances. The 3-phase screens may be shorted and earthed through suitable non-linear surge arrestor. Attempting to make a tap off from power conductors in the region where catenary is under tension is not recommended.

APPLICATION

ABC can be conveniently used:

a) as replacement of bare lines in Rural Areas, in woods and in other localities & narrows streets where the space is limited.
b) as replacement of bare lines where reliability of supply is of prime importance.
c) as replacement of bare lines where high degree of stability of supply voltage is of importance.
d) in hilly terrains where cost of erection of overhead lines or under ground cable becomes very high.
e) as reinforcement of existing system without increasing voltage.
f) for temporary supplies.

ADVANTAGES

In comparison to bare overhead power distribution lines, ABC has very high reliability in maintaining services because power and neutral conductors are insulated with the best dielectric medium, resulting in the following advantages:

1) Less fault rate on account of good protection against line and ground faults by high winds or falling trees or birds especially in hilly areas & forests as encountered in rural distribution networks.

2) High insulation resistance to earth in all seasons and polluted atmospheres. Negligible leakage currents and low losses.

3) Multiple circuits of Power and Telephone cables could be strung in the same set of poles or any other supports like walls etc.

4) Better adaptability to run concurrently with existing over-head bare conductor system without any interference.

5) High capacitance and low inductance leading to low impedance of lines.

6) Lower voltage drop, higher current capacities. VIS-À-VIS Better Voltage Regulation.

7) Longer spans and longer distance lines are possible with better system stability.

8) ABC cables are much safer than bare Conductors.

9) It can be over hung in dense vegetation and forests.

10) Additional connections can be easily and quickly made with hot-line connectors.

11) Total lines costs are reduced.

12) Maintenance is very easy.

COMPARATIVE COSTS INDEX:

System	Cost Index
U.G.Cable System	1.00
O.H.Bare Conductor System	0.35
ABC System	0.50

RELIABILITY, SAFETY AND FLEXIBILITY:

ABC Cables are highly reliable and insulation has been developed to withstand heat, cold and intense sunlight. Disturbance and faults occur five to ten times more often in open wire lines than in ABC lines. There is no risk in touching the live cable and the insulation reduces the number of short circuits and over-voltages in overhead cables during thunderstorms. Few hardware accessories are needed as each one can be used with many different sizes of cable. This makes installation and storage easier. Streets can easily be get lit at little extra cost by using the ABC cables that have an extra conductor for lighting. The cable can be supplied with one or two insulated conductors for street lighting.

EXPERIENCE:

After extensive research Polycab has successfully developed and introduced Aerial Bunched Conductor Cables, and have already achieved technical competence, manufacturing ability, and marketing experience by supplying ABC cables to the following Customers: -

1.BSES LTD (for Gridco – Orissa)
2.North Delhi Power Ltd - Delhi

TAILOR MADE DESIGN

POLYCAB have recognized the need for H.T & L.T ABC cables in the emerging market due to thrust in the Transmission & Distribution network revamping programme by Govt. of India. We can interact with you to design for you ABC cables to meet your specific requirements.

HARDWARE AND ACCESSORIES:

The hardware and accessories for AB cables are made by various reputed manufacturer and is easily available in India. They are similar to the standard hardware available for Bare conductor overhead distribution lines.

APPROVAL & CERTIFICATION

1. **BIS License for IS-694-1990 for 1100V Wires & Cables.**
2. **BIS License for IS- 1554.**
3. **BIS License for IS-7098 PART I & II**
4. **BIS License for Overhead Aluminium Conductor (IS-398) and Copper Conductor (IS-282) and IS-8130 for other Conductors.**
5. **Quality System Certification upgradation from ISO- 9002 to ISO-9001 by Underwriters Laboratories, in final stage**
6. **Safety Certification for various conductors as per BASEC are under finalisation.**

QUALITY SETUP

Conductors are generally the only means to transport current or signals with required safety norms. Therefore the material of its construction, purity and other important aspects of metallurgy are the critical factors to source the wire rods. We have latest 3-D profile die checking and refurbishment system. The sourcing of wire drawing, lubricant is from company like Houghton Italy and intensive inspection testing Conductor to ensure quality.

At Polycab, We do;

QA IN PLANNING

Customer requirements, alongwith the orders are taken into quality planning with due care for designing, manufacturing, testing and performance aspects.

QA IN RAW MATERIALS

The raw materials are procured from the best sources from the domestic and global market. These sources are selected on the based on the company's stringent quality vendor evaluation/ continuous assessment and testing.

QA ONLINE

The company has online computerised control system on all its critical processes and a team of online testing engineers to ensure the consistency in quality

TESTING

Each consignment of conductor & wires is exhaustively tested before dispatch clearance, by highly qualified, Experienced and dedicated testing team.

The testing setup is broadly classified as follows

(1) R.M. Testing Labs.
(2) Routine Testing for Conductor, LT wires & Cables
(3) Type Testing Labs include FR/FS/FRLS testing

All the laboratories are equipped with the modern testing Instruments. All the instruments are under strict Calibration and environment control.

TECHNICAL PARTICULARS

LT Aerial Bunched Cable 1100 Volts (3 1/2 core). Reference standard: Generally to IS: 7098 (1)88.

Sl No.	Description		3x25 + 1x16 + 1x35	3x35 + 1x16 + 1x35	3x50 + 1x25 + 1x35	3x70 + 1x35 + 1x35	3x95 + 1x50 + 1x55
1.	**Power/Neutral core:**						
1.2	**Conductors**						
	a) Nom. cross sectional area						
	(i) Power cores	(mm2)	25	35	50	70	95
	(ii) Neutral core	(mm2)	16	16	25	35	50
	b) Max.D.C.resistance conductor at 20 C						
	(i) Power cores	(Ohm/Km)	1.20	0.868	0.641	0.443	0.320
	(ii) Neutral core	(Ohm/Km)	1.91	1.910	1.200	0.868	0.641
	c) Approx. diameter of Conductor						
	(i) Power cores	(mm)	6.2	7.3	8.35	10.1	12.00
	(ii) Neutral core	(mm)	5.1	5.1	6.20	7.30	8.35
	Insulation:						
1.2	Minimum thickness:						
	(i) Power cores	(mm)	0.9	0.9	1.0	1.1	1.1
	(ii) Neutral core	(mm)	0.7	0.7	0.9	0.9	1.0
2.	**Messenger Wire (Bare):**						
	(i) Nom. cross sectional area	(Sq. mm)	35	35	35	55	55
	(ii) Approx. breaking load	(KN)	41	41	41	62	62
3.	**Current ratings:** Continuous current carrying Capacity of cable in Air at Ambient temp. 40 ^{0} C	(Amp.)	99	122	149	190	235
4.	**Approx. weight**	**(kg./km.)**	**580**	**665**	**810**	**1165**	**1430**
5.	**Number of cores:**						
	(i) Power cores		(No.) : 3				
	(ii) Neutral core		(No.) : 1				
	(iii) Bare messenger		(No.) : 1				
6.	**Derating factor:** Derating factors for variation In air Temp.						
	Air Temp	(^{0}C)	30 35 40 45 50 55				
	Rating factor		1.12 1.06 1.0 0.94 0.88 0.83				
7.	**(i) Identification of Power core:**		By providing ridges on the insulation:				
	(ii) Laying:		Three power cores and one neutral core shall be suitably twisted around bare H.T. Steel Messenger./ AAAC				
8.	**Details of the Power/Neutral core:**						
	(i) Conductor:						
	(a) Material		Aluminium to IS: 8130/84				
	(b) Flexibility class as per IS: 8130/84		Class-2				
	(c) Form of conductor		Compacted circular				
	(ii) Insulation:						
	(a) Material		Cross linked Polyethylene to IS: 7098(I)/88				
	(b) Colour of Insulation		Black				
9.	**Details of the Messenger wire (Bare)**						
	(i) Material		ACSR/AAAC Conductor to IS: 398(II) & (IV) respectively.				
	(ii) Form of conductor		Stranded circular/compacted circular.				

TECHNICAL PARTICULARS

LT Aerial Bunched Cable 1100 Volts (4 core). Reference standard: Generally to IS:7098(1)88.

Sl No.	Description		3x25 + 1x25 + 1x35	3x35 + 1x35 + 1x35	3x50 + 1x50 + 1x35	3x70 + 1x70 + 1x55	3x95 + 1x95 + 1x55
1.	**Power/Neutral core:**						
1.1	**Conductors**						
	a) Nom. cross sectional area						
	(i) Power cores	(mm2)	25	35	50	70	95
	(ii) Neutral core	(mm2)	25	35	50	70	95
	b) Max. D.C. resistance conductor at 20^0 C						
	(i) Power cores	(Ohm/Km)	1.20	0.868	0.641	0.443	0.320
	(ii) Neutral core	(Ohm/Km)	1.20	0.868	0.641	0.443	0.320
	c) Approx. diameter of Conductor						
	(i) Power cores	(mm)	6.2	7.3	8.35	10.1	12.0
	(ii) Neutral core	(mm)	6.2	7.3	8.35	10.1	12.0
1.2	**Insulation:** Minimum thickness:						
	(i) Power cores	(mm)	0.9	0.9	1.0	1.1	1.1
	(ii) Neutral core	(mm)	0.9	0.9	1.0	1.1	1.1
2.	**Messenger Wire (Bare):**						
	(i) Nom. cross sectional area	(Sq. mm)	35	35	35	55	55
	(ii) Approx. breaking load	(KN)	41	41	41	62	62
3.	**Current ratings:** Continuous current carrying capacity of cable in Air at Ambient temp. 40^0 C	(Amp.)	99	122	149	190	235
4.	**Approx.weight (kg./km.)**		**610**	**725**	**880**	**1270**	**1570**
5.	**Number of cores:**						
	(i) Power cores		(No.) : 3				
	(ii) Neutral core		(No.) : 1				
	(iii) Bare messenger		(No.) : 1				
6.	**Derating factor:** Derating factors for variation In air Temp.						
	Air Temp	(^{0}C)	30 35 40 45 50 55				
	Rating factor		1.12 1.06 1.0 0.94 0.88 0.83				
7.	(a) Identification of Power core**:**		By providing ridges on the insulation				
	(b) Laying		Three power cores and one neutral core shall be suitably twisted around bare H.T.Steel Messenger. /AAAC**.**				
8.	**Details of the Power/Neutral core:**						
	(i) Conductor:						
	(a) Material		Aluminium to IS: 8130/84				
	(b) Flexibility class as per IS: 8130/84		Class-2				
	(c) Form of conductor		Compacted circular				
	(ii) Insulation:						
	(a) Material		Cross linked Polyethylene to IS: 7098(I)88				
	(b) Colour of Insulation		Black				
9.	**Details of the Messenger wire (Bare)**						
	(i) Material		ACSR/AAAC. Conductor to IS: 398 (II) & (IV) respectively				
	(ii) Form of conductor		Stranded circular/compacted circular.				

TECHNICAL PARTICULARS

LT Aerial Bunched Cable 1100 Volts (5 core) with Street Lighting Conductor. Reference Standard: Generally to IS:6474-71

Sl. No.	Description	3x16 + 1x16 + 1x25	3x25 + x16 + 1x25	3x35 + 1x16 + 1x25	3x50 + 1x16 + 1x35	3x70 + 1x16 + 1x50	3x95 + 1x16 + 1x70	3x120 + 1x16 + 1x70
1.	**Power /Neutral core**:							
1.1	**Conductors**							
	(a) Nom. cross sectional area							
	(i) Phase Conductor (mm2)	16	25	35	50	70	95	120
	(ii) Street Lighting Conductor (mm2)	16	16	16	16	16	16	16
	(b) Max. D.C. resistance conductor at 20^0 C							
	(i) Phase Conductors (Ohm/Km)	1.91	1.20	0.868	0.641	0.443	0.320	0.253
	(ii) Street Lighting (Ohm/Km)	1.91	1.91	1.910	1.910	1.910	1.910	1.910
	(c) Approx. diameter of conductor							
	(i) Phase Conductor (mm)	4.4	5.5	6.8	7.9	9.6	11.3	12.7
	(ii) Street Lighting conductor (mm)	4.4	4.4	4.4	4.4	4.4	4.4	4.4
1.2	**Insulation:**							
	Minimum thickness:							
	(i) Phase Conductor (mm)	1.0	1.0	1.0	1.2	1.4	1.4	1.6
	(ii) Street Lighting Conductor (mm)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
2.	**Messenger Wire (Bare)**							
	(i) Nom. cross sectional area (Sq.mm)	25	25	25	35	50	70	70
	(ii)Approx. breaking load (KN)	7.4	7.4	7.4	10.3	14.7	20.6	20.6
3.	**Current ratings**: Continuous current carrying Capacity of cable in Air at Ambient temp. 40^0C (Amp.)	51	70	86	105	130	155	180
4.	**Approx.weight (Kg./Km)**	**310**	**390**	**490**	**640**	**890**	**1180**	**1430**
5.	**Number of cores**:							
	(i) Power cores	(No.) : 3						
	(ii) Neutral core	(No.) : 1						
	(iii) Bare messenger	(No.) : 1						
6.	**Derating factor**:							
	Derating factors for variation In air Temp.							
	Air Temp (^{0}C)	30 35 40 45 50 55						
	Rating factor	1.12 1.06 1.0 0.94 0.88 0.83						
7.	**(a) Identification of Power cores**:	By providing ridges on the insulation						
	(b) Laying	Three power cores and one neutral Core shall be suitably twisted around Bare AAAC Messenger.						
8.	**Details of the Power/Neutral core**:							
	(i) Conductor:							
	(a) Material	Aluminium to IS:8130/84						
	(b) Flexibility class as per IS: 8130/84	Class-2						
	(c) Form of conductor	Compacted circular						
	(ii) Insulation							
	(a) Material	High Density Polyethylene to IS: 6474 – 1971						
	(b) Colour of insulation	Black						
9.	**Details of the Messenger wire (Bare)**							
	(i) Material	All Alloy Aluminium Conductor to IS: 398 (IV)						
	(ii) Form of conductor	Stranded Compacted circular.						

TECHNICAL PARTICULARS

LT Aerial Bunched Cable 1100 Volts (4 core). Reference standard: Generally to IS: 6474-71.

Sl No.	Description		3x16 + 1x25	3x25 + 1x25	3x35 + 1x25	3x50 + 1x35
1.	**Power/Neutral core:**					
1.1	**Conductors**					
	a) Nom. cross sectional area					
	(i) Power cores	(mm2)	16	25	35	50
	(ii) Neutral conductor	(mm2)	25	25	25	35
	b) Max. D.C. resistance conductor at 20^0 C					
	(i) Phase Conductor	(Ohm/Km)	1.91	1.20	0.868	0.641
	(ii) Neutral Conductor	(Ohm/Km)	1.38	1.38	1.38	0.968
	c) Approx. diameter of conductor (Compacted)					
	(i) Phase conductor	(mm)	4.4	5.5	6.8	7.9
	(ii) Neutral Conductor	(mm)	5.8	5.8	5.8	6.8
1.2	**Insulation**:					
	Minimum thickness:					
	(i) Phase Conductor	(mm)	1.0	1.0	1.0	1.2
2.	**Messenger Wire (Bare)**					
	(i.) Nom. cross sectional area	(Sq. mm)	25	25	25	35
	(ii.) Approx. Tensile Strength	(KN)	7.4	7.4	7.4	10.3
3.	**Current ratings:** Continuous current carrying Capacity of cable in Air at Ambient temp. 40^0 C	(Amp.)	60	76	92	110
4.	**Approx.weight**	**(kg./km.)**	**250**	**330**	**430**	**580**
5.	**Number of cores:**					
	(i) Power cores		(No.) : 3			
	(ii) Neutral messenger core		(No.) : 1			
6.	**Derating factor**:					
	Derating factors for variation I In air Temp.					
	Air Temp	(^{0} C)	30 35 40 45 50 55			
	Rating factor		1.12 1.06 1.0 0.94 0.88 0.83			
7.	**(i) Identification of Power core:**		By providing ridges on the insulation			
	(ii) Laying:		Three power cores and one neutral core shall be suitably twisted around bare AAAC Messenger.			
8.	**Details of the Power/Neutral core:**					
	(i) Conductor					
	(a) Material		Aluminium to IS:8130/84			
	(b) Flexibility class as per IS: 8130/84		Class-2			
	(c) Form of conductor		Compacted circular			
	(ii) Insulation:					
	(a) Material		High Density Polyethylene to IS: 6474 –1971			
	(b) Colour of insulation		Black			
9.	**Details of the Messenger wire (Bare)**					
	(i) Material		All alloy aluminium Conductor to IS: 398 (IV)			
	(ii) Form of conductor		Stranded compacted circular.			

FINISHED AERIAL BUNCHED CABLE TESTING

Prior to despatch, cable is subjected to rigorous testing. Test procedures followed at our works are according to various national & International specifications and are covered in this paper.

Following tests are performed on Aerial Bunched Cables:-

1. Test on Phase/Street lighting conductor

TESTS	METHOD OF TESTING
a) Tensile test	IS: 10810 pt - 2
b) Wrapping test	IS: 10810 pt - 3
c) Conductor Resistant Test	IS: 10810 pt - 5
d) Test for thickness of insulation	IS: 10810 pt - 6
e) Physical test for polyethylene insulation	
(i) Tensile strength & Elong. Test	IS: 10810 pt - 7
(ii) Melt flow Index	IS: 10810 pt - 23
(iii) Vicat softening Point	IS: 10810 pt - 22
(iv) Carbon Black Content & dispersion	IS: 10810 pt - 32
(v) Colour factness	IS: 10810 pt - 18
(vi) Environmental stress cracking	IS: 10810 pt - 29
(vii) Bleeding & Blooming	IS: 10810 pt - 19
(viii) Volume Resistivity test	IS: 10810 pt - 43
(f) High Voltage test including water immersion test.	IS: 1596

2. Test for messenger conductor: -

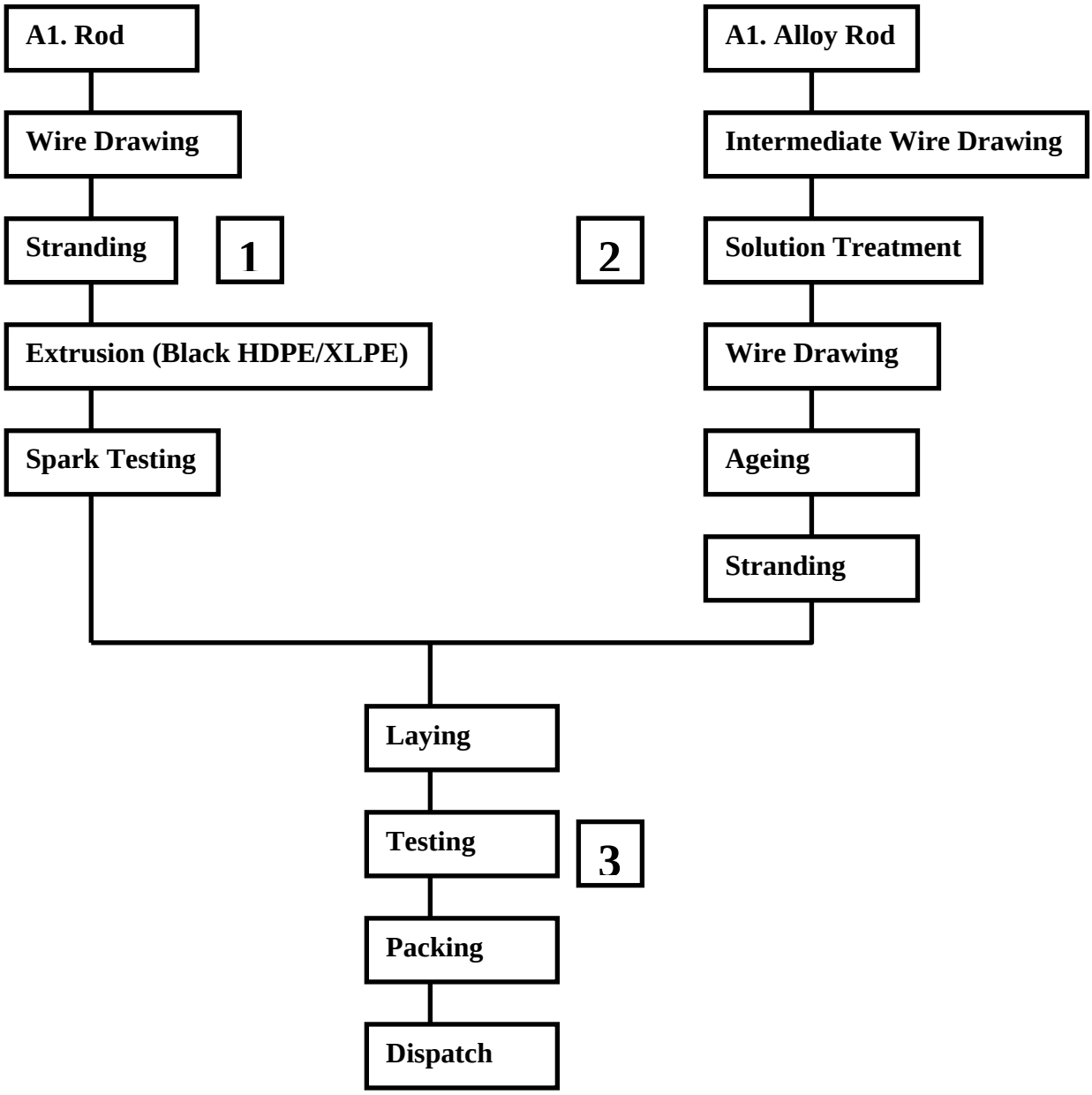
(a) Breaking load test	IS: 398 (pt-IV)
(b) Elongation test	IS: 398 (pt-IV)
(c) Resistance test	IS: 398 (pt-IV)

3. Dimentional test as per the parameters specified in the technical particulars.

4. Bending test on completed cable shall also as performed. The diameter of mandrel shall be 10 (D+d)

   Where D = Overall diameter of the cable
   D = Dia over conductor.

PROCESS FLOW CHART FOR MANUFACTURE OF AERIAL BUNCHEDCABLES

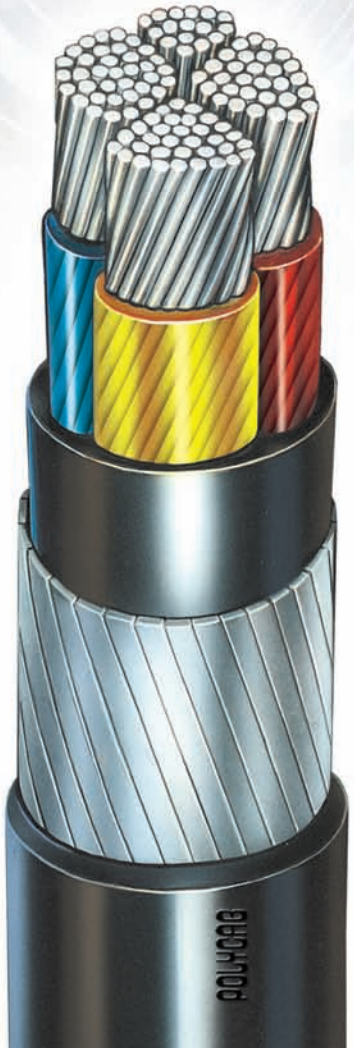


1. **Manufacture of phase/street lighting conductor**.
2. **Manufacture of messenger conductor**.
3. **Twisting of cores for manufacture of Aerial Bunched Cables**.

ISO 9001:2000

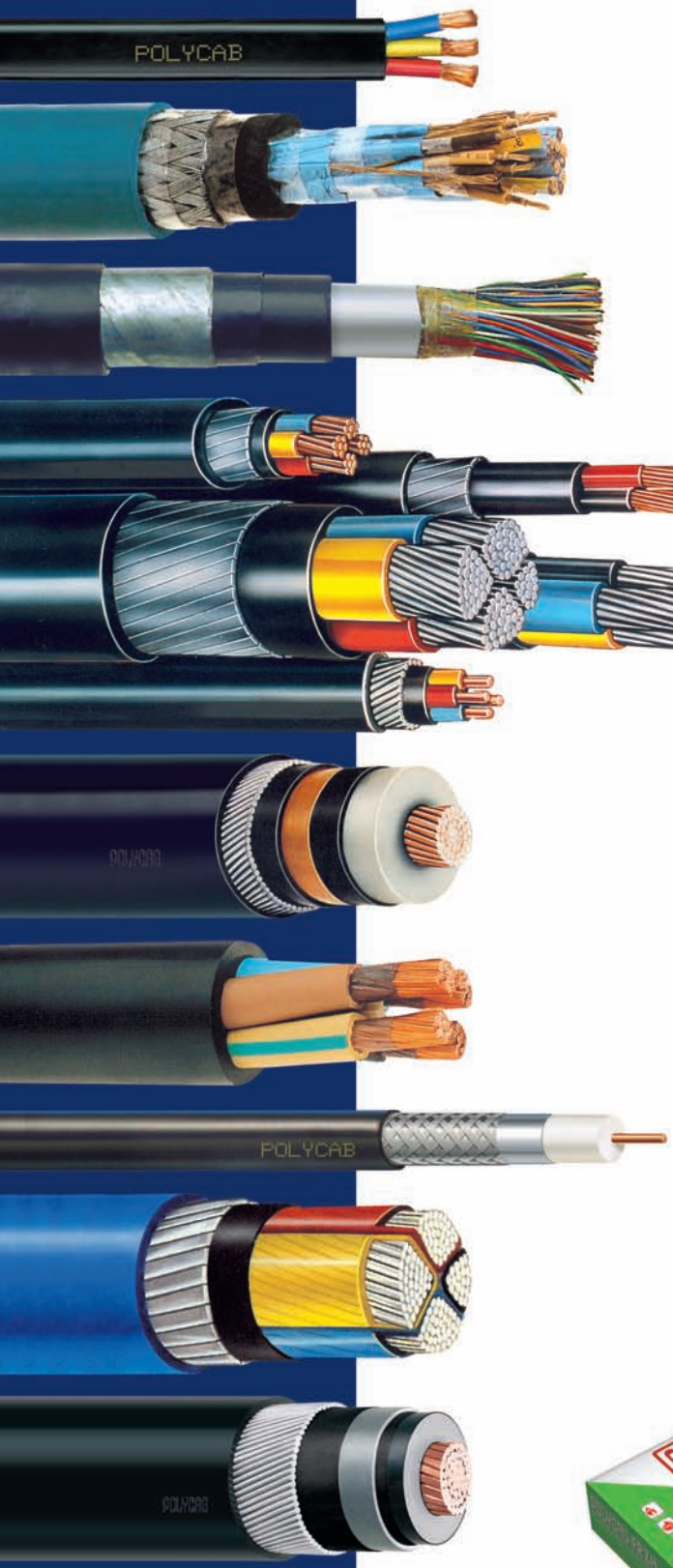
IS 7098 (Part I)

Details make the Difference



POLYCAB®
WIRES & CABLES

XLPE INSULATED HEAVY DUTY CABLES 650/1100V.



PRODUCT RANGE

- L.T. PVC & XLPE POWER CABLES WITH COPPER / ALUMINIUM CONDUCTOR (1100 V. UPTO 4 CORE X 630 SQ. MM., 1 CORE X 1000 SQ. MM.)
- L.T PVC & XLPE CONTROL CABLES (1100 V. UPTO 61 CORE X 1.5 & 2.5 SQ.MM.)
- H.T. XLPE CABLES UPTO 132 kV
- FIRE SURVIVAL, ZERO HALOGEN CABLES
- THERMO COUPLE COMPENSATING & EXTENSION CABLES
- INSTRUMENTATION CABLES SCREENED / UNSCREENED
- FRLS / FR / HR / HFFR / HOFR / RUBBER – POWER, CONTROL & INSTRUMENTATION CABLES
- HT / LT AERIAL BUNCHED CABLES
- RAILWAY SIGNALLING CABLES
- TELEPHONE CABLES – DRY & JELLY FILLED
- ACSR & AAAC CONDUCTORS
- MINING / WELDING – RUBBER CABLES
- EPR / SILICONE / HIGH TEMP. CABLES
- SUBMERSIBLE CABLES
- COAXIAL CABLES
- BUILDING WIRES & FLEXIBLES (SINGLE & MULTICORE)
- LAN CAT-5 / 5E, 6 CABLES
- PVC PIPES & ACCESSORIES
- INDUSTRIAL PLUGS & SOCKETS

Contents

POLYCAB WIRES & CABLES
AN ISO 9001:2000 COMPANY

THE COMPANY

POLYCAB, an ISO 9001: 2000 company is the largest Wire & Cable manufacturer in India with a proven track record of over three decades. The fastest growing company in the Indian Cable Industry with consistent growth of more than 40% per annum for the last 4 years. Polycab group has crossed Rs. 2000 crore turnover in the year 2006-07 and is set to achieve Rs. 3000 crore turnover in the year 2007 – 08.

From a modest beginning with Wires and Cables, over three decades ago Polycab set up State of Art manufacturing facilities at Daman in 1996.The last 3 decades have seen the core business develop along different product lines: - Low Voltage Cables, Medium Voltage Cables, Extra High Voltage Cables, Fire Survival & Fire Resistant Cables, Telecommunication Cables, Control & Instrumentation Cables and Aerial Bunched Cables. In the manufacture of cables, a competitive edge lies not so much in product innovation as in providing consistent quality, guaranteeing reliability and ready availability. Polycab's Daman factory was created to address these key market determinants. The manufacturing set up is sourced out from the world renowned Machinery and Technology suppliers with constant upgradation and expansions.

CUSTOMER SATISFACTION

In an ongoing process to improve Customer Satisfaction Polycab offers a variety of services:

- Commercially competitive prices.
- Reliable & consistent quality.
- Reliable & just in time delivery.
- Product development for a changing market.
- A targeted stocking policy.
- Technical Support for Applications/ Projects

CUSTOMER FOCUSED

POLYCAB derives its strength from its customers. The growth of the latter is a prerequisite to the growth of the company and hence customers' satisfaction is its prime objective. Over the years sincere service and dedication to its Customers has earned the Company distinguished Customers which includes demanding leaders in Sectors like Utilities, Power Generation, Transmission & Distribution, Petroleum & Oil Refineries, Oem's, EPC contractors, Steel & Metal, Cement, Chemical, Atomic Energy, Nuclear Power, Consultants & Specifiers etc.

POLYCAB has highly experienced, qualified and dedicated professionals with strong adherence to the quality management system. Polycab has offices all over the country and also has a wide network of authorized distributors and dealers to cater to all the customer segments in India and abroad.

POLYCAB has earned the trust and reputation in India and abroad by winning the customers' confidence. Several thousands kilometers of LT XLPE Cables in the voltage range of 1.1KV have been manufactured and are in operation in India and abroad.

Polycab LT XLPE Cables are preferred choice in Power Plants, Distribution Systems, Heavy Industries, Various Utilities, The Titans of Indian Industry & Consultants / Specifiers.

DETAILS MAKE THE DIFFERENCE

More than 3 decades of experience have enabled POLYCAB to develop a specific know how for each individual productline. Attention to details allows the company to apply optimum technical solutions and material selections to each and every different project or application.

Other available Catalogues:

Flexible Cables

LT PVC Power & Control Cables.

HT Cables upto 45KV

EHV Cables upto 132Kv

Fire Survival Cables.

Polycab Wires Pvt. Ltd. takes every precaution to ensure the information given in this publication is correct. E & O.E. all information is subject to change without notice.

The XLPE insulated heavy duty cables were introduced worldwide in mid sixties. These cables have overcome the limitations of PVC Insulated Cables such as thermal degradation, poor moisture resistant and thermoplastic in nature.

The advantages of XLPE Insulated cables in comparison to PVC insulated cables are as under:

A. Technical Advantages :

1. Higher current rating, higher Short Circuit Rating Approx 1.2 times that of PVC.
2. Thermosetting in nature.
3. Higher insulation resistance – 1000 times more than PVC cables.
4. Higher resistance to moisture.
5. Better Resistance to surge currents.
6. Low Dielectric Losses.
7. Better resistance to chemicals.
8. Longer service life.
9. Comparatively higher cable operation temperature 90°C and short circuit temperature 250°C.

B. Commercial Advantages:

1. Lower laying cost because of comparatively smaller diameter of cable and lighter weight*.
2. Lower installation charges as the diameter of cable is comparatively lesser with smaller bending radius, requiring less space requirement for laying of cables.
3. **One size lower cable can be used as compared to PVC insulated cable.

** Density of XLPE is lower than PVC*

***For longer cable length voltage drop shall be considered*

HIGHER ELECTRICAL STRENGTH RETENTION

HIGHER SHORT CIRCUIT RATING

BETTER ELECTRICAL, MECHANICAL & THERMAL PROPERTIES

EASY JOINTING & TERMINATION

Selection of Cables

Power Cables are generally selected considering the application. However, following factors are important for selection of suitable cable construction required to transport electrical energy from one end to the other.

1) Maximum operating voltage,
2) Fault Level,
3) Load to be carried,
4) Possible overloading duration & magnitude,
5) Route length and voltage drop.
6) Mode of installation considering installation environment such as ambient & ground temperature chemical & physical properties of soil.
7) Flame retardant properties.

All sizes of POLYCAB XLPE cables are designed to standard operating conditions in India and abroad. The standards adopted are considering the geographical/ climatical conditions and general applications of power for utilities, distribution and generation purposes.

The cables are manufactured conforming to Indian & International cables specifications for XLPE Insulated cables. Customer specific requirements can also be met.

Comparative current Rating and Short Circuit Rating for XLPE Cable Vis-à-vis PVC Cables

POLYCAB WIRES & CABLES
AN ISO 9001:2000 COMPANY

COMPARATIVE CURRENT RATINGS OF 650/1100 VOLTS MULTICORE HEAVY DUTY PVC INSULATED CABLES & XLPE INSULATED CABLES.

(3. 3.5 & 4 Core Unarmoured / Armoured PVC Sheathed Cables with Aluminium Conductor.)

Nominal Size of cable	3, 3.5 & 4 Core PVC Insulated & Sheathed Cables as per IS - 1554 (Part-1) 1988			3, 3.5 & 4 Core XLPE Insulated & Sheathed Cables as per IS - 7098 (Part-1) 1988		
	In Ground	In Air	Approx Voltage Drop	In Ground	In Air	Approx Voltage Drop
Sq. mm	Amp	Amp	Mv / amp / mtr	Amp	Amp	Mv / amp / mtr
16	60	51	4.0	73	70	4.20
25	76	70	2.5	94	96	2.70
35	92	86	1.8	113	117	1.90
50	110	105	1.3	133	142	1.40
70	135	130	0.93	164	179	0.99
95	165	155	0.68	196	221	0.72
120	185	180	0.54	223	257	0.58
150	210	205	0.46	249	292	0.48
185	235	240	0.38	282	337	0.39
240	275	280	0.28	326	399	0.31
300	305	315	0.25	367	455	0.26
400	335	375	0.20	420	530	0.21

COMPARISON OF SHORT CIRCUIT RATING FOR 1 SECOND DURATION FOR
*** PVC & XLPE Insulated Cables ** with Copper and Aluminium Conductors.** (Current in kAmps)

Nominal Size	PVC Insulated		XLPE Insulated	
Sq. mm	Copper	Aluminium	Copper	Aluminium
1.5	0.173	-	0.21	-
2.5	0.283	-	0.36	-
4	0.46	0.303	0.57	0.38
6	0.690	0.455	0.86	0.57
10	1.15	0.758	1.40	0.94
16	1.84	1.21	2.30	1.50
25	2.88	1.90	3.60	2.40
35	4.03	2.65	5.00	3.30
50	5.75	3.79	7.10	4.70
70	8.05	5.31	10.00	6.60
95	10.90	7.20	13.60	9.00
120	13.80	9.10	17.10	11.30
150	17.30	11.40	21.40	14.20
185	21.30	14.02	26.40	17.50
240	27.60	18.20	34.30	22.60
300	34.50	22.80	42.90	28.30
400	46.00	30.40	57.10	37.70
500	57.50	38.00	71.40	47.20
630	72.50	47.25	90.00	59.40
800	92.00	60.00	114.30	75.50
1000	115.00	75.00	142.90	94.30

* PVC Type 'A' Insulation as per IS-5831 '84.
** PVC Cables as per IS-1554 (Part-1)-1988.
** XLPE Cables as per IS-7098 (Part-1)-1988.

1) Max. Conductor Temperature during operation PVC 70°C XLPE 90°C

2) Max. Conductor Temperature During Short circuit. 160°C 250°C

Formula relating Short Circuit Rating with duration

$$It = \frac{I\,sh}{\sqrt{t}}$$

Where
It = Short Circuit Rating for t Seconds.
t = Duration in seconds
Ish = Short Circuit rating for 1 second.

CAPACITANCE APPROXIMATE CAPACITANCE (Microfarads/ Km) 1.1 KV XLPE CABLES.

Nominal Area of Conductor	Single Core		Two Core	Three, Three & Half and Four Core
	Unarmoured	Armoured		
1.5	0.19	-	0.051	0.15
2.5	0.24	-	0.058	0.18
4	0.29	-	0.065	0.22
6	0.34	-	0.071	0.25
10	0.43	0.32	0.081	0.31
16	0.51	0.38	0.088	0.36
25	0.49	0.38	0.089	0.41
35	0.57	0.44	0.096	0.47
50	0.58	0.46	0.098	0.50
70	0.63	0.51	0.100	0.53
95	0.73	0.59	0.110	0.61
120	0.74	0.61	0.110	0.63
150	0.73	0.61	0.110	0.64
185	0.69	0.59	0.110	0.65
240	0.74	0.64	0.110	0.66
300	0.80	0.69	0.120	0.67
400	0.83	0.70	0.120	0.67
500	0.83	0.71	0.120	0.69
630	0.87	0.75	0.110	0.73
800	0.92	0.78	-	-
1000	0.94	0.81	-	-

REACTANCE APPROXIMATE REACTANCE AT 50 HZ (Ohm/Km) 1.1 KV XLPE CABLES.

Nominal Area of Conductor	Single Core		Multi Core
	Unarmoured	Armoured	
1.5	0.155	-	0.107
2.5	0.142	-	0.0985
4	0.132	-	0.0927
6	0.123	-	0.0884
10	0.114	0.134	0.0837
16	0.108	0.125	0.0808
25	0.103	0.120	0.0805
35	0.0986	0.114	0.0783
50	0.0937	0.108	0.0750
70	0.0900	0.102	0.0740
95	0.0865	0.100	0.0724
120	0.0841	0.0968	0.0712
150	0.0839	0.0941	0.0716
185	0.0836	0.0932	0.0718
240	0.0813	0.0900	0.0710
300	0.0795	0.0881	0.0705
400	0.0787	0.0873	0.0704
500	0.0779	0.0859	0.0702
630	0.0785	0.0843	0.0698
800	0.0755	0.0826	-
1000	0.0752	0.0825	-

POLYCAB WIRES & CABLES
AN ISO 9001:2000 COMPANY

CONDUCTOR TECHNICAL INFORMATION FOR SINGLE CORE AND MULTICORE CABLES CONFORMING TO IS-8130/1984 (STRANDED - CLASS-2) COPPER & ALUMINIUM CONDUCTORS.

Nominal Size of Conductor	Minimum no. of wires				Max D.C. Resistance at 20°C		A. C. Resistance at 90°C	
	Non Compacted		Compacted Round/ Shaped		Plain Copper	Aluminium	Plain Copper	Aluminium
Sq.mm	CU.	ALU.	CU.	ALU.	Ohm/Km	Ohm/Km	Ohm/Km	Ohm/Km
1.5*	3	3	-	-	12.1	18.10	15.50	23.17
2.5*	3	3	-	-	7.41	12.10	9.48	15.50
4*	7	3	-	-	4.61	7.41	5.90	9.48
6*	7	3	-	-	3.08	4.61	3.94	5.90
10*	7	7	6	-	1.83	3.08	2.34	3.94
16	7	7	6	6	1.15	1.91	1.47	2.44
25	7	7	6	6	0.727	1.20	0.930	1.54
35	7	7	6	6	0.524	0.868	0.671	1.11
50	19	19	6	6	0.387	0.641	0.495	0.82
70	19	19	12	12	0.268	0.443	0.343	0.567
95	19	19	15	15	0.193	0.320	0.247	0.410
120	37	37	18	15	0.153	0.253	0.196	0.324
150	37	37	18	15	0.124	0.206	0.159	0.264
185	37	37	30	30	0.0991	0.164	0.127	0.210
240	61	37	34	30	0.0754	0.125	0.0965	0.160
300	61	61	34	30	0.0601	0.100	0.0769	0.128
400	61	61	53	53	0.0469	0.0778	0.0602	0.100
500	61	61	53	53	0.0366	0.0605	0.0468	0.0774
630	91	91	53	53	0.0283	0.0469	0.0362	0.0600
800	91	91	53	53	0.0221	0.0367	0.0283	0.0470
1000	91	91	53	53	0.0176	0.0291	0.0225	0.0372

** These sizes can be manufactured with solid conductor having single strand*

POLYCAB RECOMDATIONS FOR CURRENT RATINGS

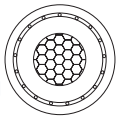
1. The values given in the table are valid for on circuit in a three phase system under conditions specified. For grouping cables rating factors must be used.
2. The current carrying capacities mentioned in POLYCAB technical data are intended as a guide, to assist operating engineers in selecting cables for safety and reliability.
3. Basic assumptions and condition of installation:
   - Ambient ground Temperature : 30° C
   - Ambient air Temperature: 40° C
   - Depth of Cable Burial : 1.0 m
   - Thermal resistivity of soil : 150° C. Cm/W
4. Single Core Cables are installed as indicated in the table, spacing between cables in flat formation is as indicated.
5. For 3 and 4 core cables, it is usual to assume the same current carrying capacity for 4 core cables as for 3 core cables. Our calculated values are based actually on 3 core cables. These values are suitable with enough accuracy also for 4 cables in most cases. Only for large 4 core cables in air the values are too conservative, due to the large cable surface and consequent high heat dissipation factor.
6. To obtain the maximum current carrying capacity of a cable operating at different conditions from the standard. Various rating factors are to be multiplied as follows:

   Ia = K Is (in Amperes) Where

   Ia = Current Rating at actual Operating Conditions (amperes)
   Is = Current Rating at Standard Operating Conditions (amperes)
   K = Rating Factor as applicable

TABLE-1 "POLYCAB" SINGLE CORE ALUMINIUM CONDUCTOR, XLPE INSULATED,

UNARMOURED & ARMOURED CABLE CONFORMING TO IS 7098 PART-1/1988



650/1100 VOLTS

WEIGHT & DIMENSIONS

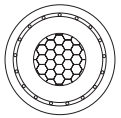
Nominal Size of Conductor	Form of Conductor Circular ○	Nominal Thickness of XLPE Insulation for U/A	Minimum Thickness of PVC Inner Sheath	Unarmoured Cable			Nominal Thickness of XLPE insulation for Armoured Cable	Formed Wire/ Strip Armoured Cable				Round Wire Armoured Cable				Current Rating.		*Normal Delivery Length.
				Nominal Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx. Weight of Cable.		Nominal Dimension of Aluminium Flat Strip.	Minimum Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx. Weight of Cable.	Nominal Dimension of Aluminium Round Wire.	Minimum Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx. Weight of Cable.	In Ground.	In Air	
Sq.mm.		mm	mm	mm	mm	Kgs./Km	mm	mm	mm	mm	Kgs./Km	mm	mm	mm	Kgs./Km	Amps.	Amps.	Mtrs.
4	Solid	0.7	-NA-	1.8	7.5	60	-	-	-	-	-	-	-	-	-	36	31	1000
4	Stranded	0.7	-NA-	1.8	8.0	65	-	-	-	-	-	-	-	-	-	36	31	1000
6	Solid	0.7	-NA-	1.8	8.0	70	-	-	-	-	-	-	-	-	-	44	39	1000
6	Stranded	0.7	-NA-	1.8	8.5	75	-	-	-	-	-	-	-	-	-	44	39	1000
10	Solid	0.7	-NA-	1.8	9.0	80	1.0	-	-	-	-	-	-	-	-	59	53	1000
10	Stranded	0.7	-NA-	1.8	9.5	90	1.0	-	-	-	-	-	-	-	-	59	53	1000
16	Stranded	0.7	-NA-	1.8	10.0	115	1.0	-	-	-	-	1.4	1.24	13.0	220	76	73	1000
25	--do--	0.9	-NA-	1.8	12.0	155	1.2	-	-	-	-	1.4	1.24	14.0	260	96	98	1000
35	--do--	0.9	-NA-	1.8	13.0	180	1.2	-	-	-	-	1.4	1.24	15.0	310	114	121	1000
50	--do--	1.0	-NA-	1.8	14.0	240	1.3	-	-	-	-	1.4	1.24	17.0	380	135	150	1000
70	--do--	1.1	-NA-	1.8	16.0	310	1.4	-	-	-	-	1.4	1.24	19.0	480	166	187	1000
95	--do--	1.1	-NA-	1.8	17.5	385	1.4	4 x 0.80	1.40	21.0	560	1.6	1.40	22.0	640	198	230	1000
120	--do--	1.2	-NA-	1.8	19.0	470	1.5	4 x 0.80	1.40	22.0	660	1.6	1.40	23.5	745	225	268	1000
150	--do--	1.4	-NA-	2.0	21.5	600	1.7	4 x 0.80	1.40	23.0	750	1.6	1.40	24.5	850	253	309	1000
185	--do--	1.6	-NA-	2.0	23.5	710	1.9	4 x 0.80	1.40	25.0	900	1.6	1.40	26.5	1000	286	360	1000
240	--do--	1.7	-NA-	2.0	26.0	900	2.0	4 x 0.80	1.40	27.5	1100	1.6	1.40	29.0	1215	332	433	1000
300	--do--	1.8	-NA-	2.0	28.5	1075	2.1	4 x 0.80	1.56	30.0	1350	1.6	1.56	31.5	1475	376	501	1000
400	--do--	2.0	-NA-	2.2	33.0	1385	2.4	4 x 0.80	1.56	34.0	1725	2.0	1.56	36.5	1925	431	596	500
500	--do--	2.2	-NA-	2.2	36.0	1650	2.6	4 x 0.80	1.56	37.5	2090	2.0	1.56	39.5	2300	490	693	500
630	--do--	2.4	-NA-	2.2	40.0	2100	2.8	4 x 0.80	1.72	40.5	2525	2.0	1.72	43.0	2800	557	814	500
800	--do--	2.6	-NA-	2.4	46.0	2730	3.1	4 x 0.80	1.72	46.5	3150	2.0	1.88	49.5	3450	600	890	500
1000	--do--	2.8	-NA-	2.6	52.0	3350	3.3	4 x 0.80	1.88	54.0	3963	2.5	2.04	58.0	4475	650	1050	500

The above data is approximate and subject to manufacturing tolerance.

* Delivery Length tolerance is ± 5 %. Length more than normal as per customer request.

TABLE-2 "POLYCAB" SINGLE CORE COPPER CONDUCTOR, XLPE INSULATED,

UNARMOURED & ARMOURED CABLE CONFORMING TO IS 7098 PART-1/1988



650/1100 VOLTS

WEIGHT & DIMENSIONS

Nominal Size of Conductor	Form of Conductor Circular ○	Unarmoured Cable					Formed Wire/ Strip Armoured Cable					Round Wire Armoured Cable				Current Rating.		*Normal Delivery Length.
		Nominal Thickness of XLPE Insulation for U/A	Minimum Thickness of PVC Inner Sheath	Nominal Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx. Weight of Cable.	Nominal Thickness of XLPE insulation for Armoured Cable	Nominal Dimension of Aluminium Flat Strip.	Minimum Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx. Weight of Cable.	Nominal Dimension of Aluminium Round Wire.	Minimum Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx. Weight of Cable.	In Ground.	In Air	
Sq.mm.		mm	mm	mm	mm	Kgs./Km	mm	mm	mm	mm	Kgs./Km	mm	mm	mm	Kgs./Km	Amps.	Amps.	Mtrs.
4	Solid	0.7	-NA-	1.8	7.5	91	-	-	-	-	-	-	-	-	-	47	42	1000
4	Stranded	0.7	-NA-	1.8	8.0	95	-	-	-	-	-	-	-	-	-	47	42	1000
6	Solid	0.7	-NA-	1.8	8.0	115	-	-	-	-	-	-	-	-	-	59	53	1000
6	Stranded	0.7	-NA-	1.8	8.5	125	-	-	-	-	-	-	-	-	-	59	53	1000
10	Stranded	0.7	-NA-	1.8	9.5	170	1.0	-	-	-	-	1.4	1.24	12.0	245	78	72	1000
16	Stranded	0.7	-NA-	1.8	10.0	220	1.0	-	-	-	-	1.4	1.24	13.0	315	102	98	1000
25	Stranded	0.9	-NA-	1.8	12.0	325	1.2	-	-	-	-	1.4	1.24	14.0	415	132	132	1000
35	Stranded	0.9	-NA-	1.8	13.0	420	1.2	-	-	-	-	1.4	1.24	16.0	525	156	156	1000
50	Stranded	1.0	-NA-	1.8	14.0	550	1.3	-	-	-	-	1.4	1.24	17.0	690	186	198	1000
70	Stranded	1.1	-NA-	1.8	16.0	750	1.4	-	-	-	-	1.4	1.24	19.0	910	228	246	1000
95	Stranded	1.1	-NA-	1.8	17.5	1010	1.4	4 x 0.80	1.40	21.0	1150	1.6	1.40	22.0	1325	264	294	1000
120	Stranded	1.2	-NA-	1.8	19.0	1250	1.5	4 x 0.80	1.40	22.0	1400	1.6	1.40	23.5	1485	300	336	1000
150	Stranded	1.4	-NA-	2.0	21.5	1550	1.7	4 x 0.80	1.40	23.0	1680	1.6	1.40	24.5	1780	336	384	1000
185	Stranded	1.6	-NA-	2.0	23.5	1900	1.9	4 x 0.80	1.40	25.0	2040	1.6	1.40	26.5	2140	366	444	1000
240	Stranded	1.7	-NA-	2.0	26.0	2450	2.0	4 x 0.80	1.40	27.5	2580	1.6	1.40	29.0	2700	414	510	1000
300	Stranded	1.8	-NA-	2.0	28.5	3050	2.1	4 x 0.80	1.56	30.0	3200	1.6	1.56	31.5	3325	450	570	500
400	Stranded	2.0	-NA-	2.2	33.0	4035	2.4	4 x 0.80	1.56	34.0	4200	2.0	1.56	36.5	4400	480	660	500
500	Stranded	2.2	-NA-	2.2	36.0	5020	2.6	4 x 0.80	1.56	37.5	5180	2.0	1.56	39.5	5400	564	708	500
630	Stranded	2.4	-NA-	2.2	40.0	6250	2.8	4 x 0.80	1.72	40.5	6425	2.0	1.72	43.0	6700	570	825	500
800	Stranded	2.6	-NA-	2.4	46.0	7900	3.1	4 x 0.80	1.72	46.5	8100	2.0	1.88	49.5	8400	660	945	500
1000	Stranded	2.8	-NA-	2.6	52.0	9850	3.3	4 x 0.80	1.88	54.0	10150	2.5	2.04	58.0	10660	723	1063	500

The above data is approximate and subject to manufacturing tolerance.

* Delivery Length tolerance is ± 5 %. Length more than normal as per customer request.

POLYCAB WIRES & CABLES
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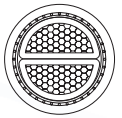
TABLE-3 "POLYCAB" TWO CORE ALUMINIUM CONDUCTOR, XLPE INSULATED,

UNARMOURED & ARMOURED CABLE CONFORMING TO IS 7098 PART-1/1988



650/1100 VOLTS

WEIGHT AND DIMENSIONS

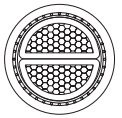
Nominal Size of Conductor	Form of Conductor Circular Shaped ○/⌓	Nominal Thickness of XLPE Insulation	Minimum Thickness of PVC Inner Sheath	Unarmoured Cable			Formed Wire/ Strip Armoured Cable				Round Wire Armoured Cable				Current Rating.		*Normal Delivery Length.
				Nominal Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx. Weight of Cable.	Nominal Dimension of GI Flat Strip.	Minimum Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx. Weight of Cable.	Nominal Dimension of GI Round Wire.	Minimum Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx. Weight of Cable.	In Ground.	In Air	
Sq.mm.	mm	mm	mm	mm	mm	Kgs./Km	mm	mm	mm	Kgs./Km	mm	mm	mm	Kgs./Km	Amps.	Amps.	Mtrs.
4	Solid ○	0.7	0.3	1.8	12.5	140	-NA-	-NA-	-NA-	-NA-	1.40	1.24	14.5	400	40	34	1000
4	Stranded ○	0.7	0.3	1.8	13.0	150	-NA-	-NA-	-NA-	-NA-	1.40	1.24	15.5	430	40	34	1000
6	Solid ○	0.7	0.3	1.8	13.5	170	-NA-	-NA-	-NA-	-NA-	1.40	1.24	15.5	470	50	44	1000
6	Stranded ○	0.7	0.3	1.8	14.0	180	-NA-	-NA-	-NA-	-NA-	1.40	1.24	16.5	485	50	44	1000
10	Solid ○	0.7	0.3	1.8	15.0	205	-NA-	-NA-	-NA-	-NA-	1.40	1.24	17.0	545	69	59	1000
10	Stranded ○	0.7	0.3	1.8	16.0	225	-NA-	-NA-	-NA-	-NA-	1.40	1.24	18.0	565	69	59	1000
16	Stranded ⌓	0.7	0.3	1.8	14.0	225	-NA-	-NA-	-NA-	-NA-	1.40	1.40	17.0	570	88	74	1000
25	Stranded ⌓	0.9	0.3	2.0	17.0	330	4 x 0.8	1.40	18.5	600	1.60	1.40	20.0	790	112	98	1000
35	Stranded ⌓	0.9	0.3	2.0	19.0	410	-do-	1.40	20.0	690	1.60	1.40	22.0	910	138	124	1000
50	Stranded ⌓	1.0	0.3	2.0	21.0	510	-do-	1.40	22.5	820	1.60	1.40	24.0	1050	169	156	1000
70	Stranded ⌓	1.1	0.3	2.0	23.0	675	-do-	1.56	25.5	1050	1.60	1.56	27.0	1325	200	188	1000
95	Stranded ⌓	1.1	0.4	2.2	26.5	900	-do-	1.56	28.0	1300	2.00	1.56	30.5	1750	238	231	1000
120	Stranded ⌓	1.2	0.4	2.2	28.5	1050	-do-	1.56	30.5	1500	2.00	1.56	33.0	2000	262	262	500
150	Stranded ⌓	1.4	0.4	2.2	32.0	1215	-do-	1.72	34.0	1750	2.00	1.72	36.0	2250	300	300	500
185	Stranded ⌓	1.6	0.5	2.4	35.5	1510	-do-	1.72	37.0	2200	2.00	1.88	40.0	2750	344	344	500
240	Stranded ⌓	1.7	0.5	2.6	39.5	1900	-do-	1.88	41.0	2600	2.50	2.04	45.0	3700	400	406	500
300	Stranded ⌓	1.8	0.6	2.8	43.5	2360	-do-	2.04	45.5	3200	2.50	2.20	49.0	4400	444	456	500
400	Stranded ⌓	2.0	0.6	3.0	49.0	3100	-do-	2.36	51.0	4000	2.50	2.36	54.4	5300	481	525	500
500	Stranded ⌓	2.2	0.7	3.4	55.5	4000	-do-	2.52	56.5	5000	3.15	2.68	61.5	7000	523	678	500
630	Stranded ⌓	2.4	0.7	3.6	61.5	5000	-do-	2.68	62.5	6050	3.15	2.84	67.5	8560	592	786	500

The above data is approximate and subject to manufacturing tolerance.

* Delivery Length tolerance is ± 5 %. Length more than normal as per customer request.

TABLE-4 "POLYCAB" TWO CORE COPPER CONDUCTOR, XLPE INSULATED,

UNARMOURED & ARMOURED CABLE CONFORMING TO IS 7098 PART-1/1988



650 / 1100 VOLTS

WEIGHT AND DIMENSIONS

Nominal Size of Conductor	Form of Conductor Circular Shaped ○/⌓	Nominal Thickness of XLPE Insulation	Minimum Thickness of PVC Inner Sheath	Unarmoured Cable			Formed Wire/ Strip Armoured Cable				Round Wire Armoured Cable				Current Rating.		* Normal Delivery Length.
				Nominal Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx. Weight of Cable.	Nominal Dimension of GI Flat Strip.	Minimum Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx. Weight of Cable.	Nominal Dimension of GI Round Wire.	Minimum Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx. Weight of Cable.	In Ground.	In Air	
Sq.mm.	mm	mm	mm	mm	mm	Kgs./Km	mm	mm	mm	Kgs./Km	mm	mm	mm	Kgs./Km	Amps.	Amps.	Mtrs.
4	Solid ○	0.7	0.3	1.8	12.5	165	-NA-	-NA-	-NA-	-NA-	1.4	1.24	14.5	480	51	44	1000
4	Stranded ○	0.7	0.3	1.8	13.0	175	-NA-	-NA-	-NA-	-NA-	1.4	1.24	15.5	525	51	44	1000
6	Solid ○	0.7	0.3	1.8	13.5	210	-NA-	-NA-	-NA-	-NA-	1.4	1.24	15.5	564	63	56	1000
6	Stranded ○	0.7	0.3	1.8	14.0	225	-NA-	-NA-	-NA-	-NA-	1.4	1.24	16.5	610	63	56	1000
10	Stranded ○	0.7	0.3	1.8	16.0	300	-NA-	-NA-	-NA-	-NA-	1.4	1.24	18.0	740	88	75	1000
16	Stranded ⌓	0.7	0.3	1.8	14.0	425	-NA-	-NA-	-NA-	-NA-	1.4	1.40	17.0	770	113	98	1000
25	Stranded ⌓	0.9	0.3	2.0	17.0	640	4 x 0.8	1.40	18.5	910	1.6	1.40	20.0	1100	144	131	1000
35	Stranded ⌓	0.9	0.3	2.0	19.0	840	-do-	1.40	20.0	1025	1.6	1.40	22.0	1350	175	150	1000
50	Stranded ⌓	1.0	0.3	2.0	21.0	1120	-do-	1.40	22.5	1435	1.6	1.40	24.0	1670	206	194	1000
70	Stranded ⌓	1.1	0.3	2.0	23.0	1540	-do-	1.56	25.5	1910	1.6	1.56	27.0	2200	256	244	1000
95	Stranded ⌓	1.1	0.4	2.2	26.5	2075	-do-	1.56	28.0	2475	2.0	1.56	30.5	2925	300	288	500
120	Stranded ⌓	1.2	0.4	2.2	28.5	2535	-do-	1.56	30.5	2985	2.0	1.56	33.0	3485	344	331	500
150	Stranded ⌓	1.4	0.4	2.2	32.0	3070	-do-	1.72	34.0	3600	2.0	1.72	36.0	4100	388	381	500
185	Stranded ⌓	1.6	0.5	2.4	35.5	3800	-do-	1.72	37.0	4490	2.0	1.88	40.0	5040	438	438	500
240	Stranded ⌓	1.7	0.5	2.6	39.5	4870	-do-	1.88	41.0	5575	2.5	2.04	45.0	7370	506	512	500
300	Stranded ⌓	1.8	0.6	2.8	43.5	6075	-do-	2.04	45.5	6910	2.5	2.20	49.0	9010	562	581	500
400	Stranded ⌓	2.0	0.6	3.0	49.0	8050	-do-	2.36	51.0	8950	2.5	2.36	54.4	10250	612	662	500

The above data is approximate and subject to manufacturing tolerance.

* Delivery Length tolerance is ± 5 %. Length more than normal as per customer request.

POLYCAB® WIRES & CABLES
AN ISO 9001:2000 COMPANY

TABLE-5 "POLYCAB" THREE CORE ALUMINIUM CONDUCTOR, XLPE INSULATED,

UNARMOURED & ARMOURED CABLE CONFORMING TO IS 7098 PART-1/1988

650/1100 VOLTS

WEIGHT AND DIMENSIONS

Nominal Size of Conductor	Form of Conductor Circular Shaped ○/△	Nominal Thickness of XLPE Insulation	Minimum Thickness of PVC Inner Sheath	Unarmoured Cable			Formed Wire/ Strip Armoured Cable				Round Wire Armoured Cable				Current Rating.		*Normal Delivery Length.
				Nominal Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx. Weight of Cable.	Nominal Dimension of GI Flat Strip.	Minimum Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx. Weight of Cable.	Nominal Dimension of GI Round Wire.	Minimum Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx. Weight of Cable.	In Ground.	In Air	
Sq.mm.	mm	mm	mm	mm	mm	Kgs./Km	mm	mm	mm	Kgs./Km	mm	mm	mm	Kgs./Km	Amps.	Amps.	Mtrs.
4	Solid ○	0.7	0.3	1.8	14.0	140	-NA-	-NA-	-NA-	-NA-	1.40	1.24	15.0	460	34	31	1000
4	Stranded ○	0.7	0.3	1.8	15.5	160	-NA-	-NA-	-NA-	-NA-	1.40	1.24	16.0	510	34	31	1000
6	Solid ○	0.7	0.3	1.8	15.5	170	-NA-	-NA-	-NA-	-NA-	1.40	1.24	16.0	530	43	50	1000
6	Stranded ○	0.7	0.3	1.8	16.0	190	-NA-	-NA-	-NA-	-NA-	1.40	1.24	17.0	580	43	50	1000
10	Solid ○	0.7	0.3	1.8	17.0	220	-NA-	-NA-	-NA-	-NA-	1.40	1.24	18.0	640	57	67	1000
10	Stranded ○	0.7	0.3	1.8	18.0	230	-NA-	-NA-	-NA-	-NA-	1.40	1.24	19.0	680	57	67	1000
16	Stranded △	0.7	0.3	1.8	18.0	310	4 x 0.8	1.24	18.5	530	1.60	1.40	21.0	750	73	70	1000
25	Stranded △	0.9	0.3	2.0	20.0	460	-do-	1.40	20.5	770	1.60	1.40	23.0	990	94	96	1000
35	Stranded △	0.9	0.3	2.0	21.5	575	-do-	1.40	23.0	900	1.60	1.40	25.0	1150	113	117	1000
50	Stranded △	1.0	0.3	2.0	24.5	700	-do-	1.40	25.5	1100	1.60	1.56	27.5	1400	133	142	1000
70	Stranded △	1.1	0.4	2.2	29.0	990	-do-	1.56	30.0	1425	2.00	1.56	32.0	1950	164	179	500
95	Stranded △	1.1	0.4	2.2	32.5	1250	-do-	1.56	33.5	1735	2.00	1.56	37.5	2300	196	221	500
120	Stranded △	1.2	0.4	2.2	34.5	1525	-do-	1.56	35.5	2050	2.00	1.72	39.5	2700	223	257	500
150	Stranded △	1.4	0.5	2.4	38.5	1900	-do-	1.72	40.5	2100	2.00	1.88	43.5	3200	249	292	500
185	Stranded △	1.6	0.5	2.6	43.5	2380	-do-	1.88	44.5	2500	2.50	2.04	48.5	4200	282	337	500
240	Stranded △	1.7	0.6	2.8	48.5	3000	-do-	2.04	49.0	3700	2.50	2.20	53.0	5100	326	399	500
300	Stranded △	1.8	0.6	3.0	51.5	3750	-do-	2.20	53.0	4500	2.50	2.36	57.5	5900	367	455	500
400	Stranded △	2.0	0.7	3.2	59.5	4760	-do-	2.52	58.5	5700	3.15	2.68	65.0	7900	418	530	500
500	Stranded △	2.2	0.7	3.6	66.0	6000	-do-	2.68	67.0	6900	3.15	2.84	73.0	9550	470	612	250
630	Stranded △	2.4	0.7	3.8	72.0	7550	-do-	2.84	73.0	8700	4.00	3.00	78.0	12500	529	707	250

The above data is approximate and subject to manufacturing tolerance.

* Delivery Length tolerance is ± 5 %. Length more than normal as per customer request.

TABLE-6 "POLYCAB" THREE CORE COPPER CONDUCTOR, XLPE INSULATED,

UNARMOURED & ARMOURED CABLE CONFORMING TO IS 7098 PART-1/1988

650/1100 VOLTS

WEIGHT AND DIMENSIONS

Nominal Size of Conductor	Form of Conductor Circular Shaped ○/△	Nominal Thickness of XLPE Insulation	Minimum Thickness of PVC Inner Sheath	Unarmoured Cable			Formed Wire/ Strip Armoured Cable				Round Wire Armoured Cable				Current Rating.		*Normal Delivery Length.
				Nominal Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx. Weight of Cable.	Nominal Dimension of GI Flat Strip.	Minimum Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx. Weight of Cable.	Nominal Dimension of GI Round Wire.	Minimum Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx. Weight of Cable.	In Ground.	In Air	
Sq.mm.	mm	mm	mm	mm	mm	Kgs./Km	mm	mm	mm	Kgs./Km	mm	mm	mm	Kgs./Km	Amps.	Amps.	Mtrs.
4	Solid ○	0.7	0.3	1.8	14.0	210	-NA-	-NA-	-NA-	-NA-	1.40	1.24	15.0	530	43	36	1000
4	Stranded ○	0.7	0.3	1.8	15.5	235	-NA-	-NA-	-NA-	-NA-	1.40	1.24	16.0	580	43	36	1000
6	Solid ○	0.7	0.3	1.8	15.5	280	-NA-	-NA-	-NA-	-NA-	1.40	1.24	16.0	640	54	47	1000
6	Stranded ○	0.7	0.3	1.8	16.0	300	-NA-	-NA-	-NA-	-NA-	1.40	1.24	17.0	680	54	47	1000
10	Stranded ○	0.7	0.3	1.8	18.0	415	-NA-	-NA-	-NA-	-NA-	1.40	1.24	19.0	865	72	62	1000
16	Stranded △	0.7	0.3	1.8	18.0	425	4 x 0.8	1.24	18.5	825	1.60	1.40	21.0	1040	92	79	1000
25	Stranded △	0.9	0.3	2.0	20.0	920	-do-	1.40	20.5	1235	1.60	1.40	23.0	1450	119	108	1000
35	Stranded △	0.9	0.3	2.0	21.5	1225	-do-	1.40	23.0	1550	1.60	1.40	25.0	1800	144	132	1000
50	Stranded △	1.0	0.3	2.0	24.5	1620	-do-	1.40	25.5	2020	1.60	1.56	27.5	2320	174	162	1000
70	Stranded △	1.1	0.4	2.2	29.0	2290	-do-	1.56	30.0	2720	2.00	1.56	32.0	3250	210	198	500
95	Stranded △	1.1	0.4	2.2	32.5	3010	-do-	1.56	33.5	3500	2.00	1.56	37.5	4060	252	240	500
120	Stranded △	1.2	0.4	2.2	34.5	3750	-do-	1.56	35.5	4320	2.00	1.72	39.5	4920	288	276	500
150	Stranded △	1.4	0.5	2.4	38.5	4760	-do-	1.72	40.5	5280	2.00	1.88	43.5	5980	324	318	500
185	Stranded △	1.6	0.5	2.6	43.5	5810	-do-	1.88	44.5	6385	2.50	2.04	48.5	7630	360	366	500
240	Stranded △	1.7	0.6	2.8	48.5	7450	-do-	2.04	49.0	8150	2.50	2.20	53.0	9550	414	426	500
300	Stranded △	1.8	0.6	3.0	51.5	9310	-do-	2.20	53.0	10060	2.50	2.36	57.5	11460	462	480	500
400	Stranded △	2.0	0.7	3.2	59.5	12200	-do-	2.52	58.5	13125	3.15	2.68	65.0	15320	510	546	250

The above data is approximate and subject to manufacturing tolerance.

* Delivery Length tolerance is ± 5 %. Length more than normal as per customer request.

POLYCAB WIRES & CABLES
AN ISO 9001:2000 COMPANY

TABLE-7 "POLYCAB" THREE AND HALF CORE ALUMINIUM CONDUCTOR, XLPE INSULATED

UNARMOURED & ARMOURED CABLE CONFORMING TO IS 7098 PART-1/1988

650/1100 VOLTS

WEIGHT AND DIMENSIONS

Nominal Size of Conductors	Form of Conductor Shaped ○/△	Nominal Thickness of XLPE Insulation Main / Neutral		Minimum Thickness of PVC Inner Sheath	Unarmoured Cable			Formed Wire/ Strip Armoured Cable				Round Wire Armoured Cable				Current Rating.		*Normal Delivery Length.
					Nominal Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx. Weight of Cable.	Nominal Dimension of GI Flat Strip.	Minimum Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx. Weight of Cable.	Nominal Dimension of GI Round Wire.	Minimum Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx. Weight of Cable.	In Ground	In Air	
Sq.mm.	mm	mm	mm	mm	mm	mm	Kgs./Km	mm	mm	mm	Kgs./Km	mm	mm	mm	Kgs./Km	Amps.	Amps.	Mtrs.
25/16	Stranded △	0.9	0.7	0.3	2.0	22.0	525	4 x 0.80	1.40	23.0	850	1.60	1.40	25.5	1050	94	96	1000
35/16	Stranded △	0.9	0.7	0.3	2.0	24.0	625	-do-	1.40	25.0	980	1.60	1.40	26.5	1200	113	117	1000
50/25	Stranded △	1.0	0.9	0.3	2.0	27.5	800	-do-	1.40	28.0	1240	1.60	1.56	29.5	1500	133	142	1000
70/35	Stranded △	1.1	0.9	0.4	2.2	31.0	1100	-do-	1.56	32.0	1600	2.00	1.56	34.0	2050	164	179	500
95/50	Stranded △	1.1	1.0	0.4	2.2	35.0	1400	-do-	1.56	36.0	1900	2.00	1.56	38.0	2450	196	221	500
120/70	Stranded △	1.2	1.1	0.4	2.2	37.5	1650	-do-	1.72	39.0	2300	2.00	1.72	41.0	2800	223	257	500
150/70	Stranded △	1.4	1.1	0.5	2.4	41.0	2000	-do-	1.72	42.0	2650	2.00	1.88	45.0	3350	249	292	500
185/95	Stranded △	1.6	1.1	0.5	2.6	46.5	2550	-do-	1.88	47.5	3250	2.50	2.04	50.0	4500	282	337	500
240/120	Stranded △	1.7	1.2	0.6	2.8	52.5	3200	-do-	2.04	53.5	4100	2.50	2.20	56.0	5450	326	399	500
300/150	Stranded △	1.8	1.4	0.6	3.0	56.0	4000	-do-	2.20	57.0	4950	2.50	2.36	61.0	6400	367	455	500
400/185	Stranded △	2.0	1.6	0.7	3.4	64.0	5250	-do-	2.52	65.0	6150	3.15	2.68	70.0	8300	418	530	500
500/240	Stranded △	2.2	1.7	0.7	3.6	72.5	6500	-do-	2.68	73.5	7600	3.15	2.84	77.0	10000	470	612	250

The above data is approximate and subject to manufacturing tolerance.

* Delivery Length tolerance is ± 5 %. Length more than normal as per customer request.

TABLE-8 "POLYCAB" THREE AND HALF CORE COPPER CONDUCTOR, XLPE INSULATED

UNARMOURED & ARMOURED CABLE CONFORMING TO IS 7098 PART-1/1988

650/1100 VOLTS

WEIGHT AND DIMENSIONS

Nominal Size of Conductors	Form of Conductor Shaped ○/△	Nominal Thickness of XLPE Insulation Main / Neutral		Minimum Thickness of PVC Inner Sheath	Unarmoured Cable			Formed Wire/ Strip Armoured Cable				Round Wire Armoured Cable				Current Rating.		*Normal Delivery Length.
					Nominal Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx. Weight of Cable.	Nominal Dimension of GI Flat Strip.	Minimum Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx. Weight of Cable.	Nominal Dimension of GI Round Wire.	Minimum Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx. Weight of Cable.	In Ground	In Air	
Sq.mm.	mm	mm	mm	mm	mm	mm	Kgs./Km	mm	mm	mm	Kgs./Km	mm	mm	mm	Kgs./Km	Amps.	Amps.	Mtrs.
25/16	Stranded △	0.9	0.7	0.3	2.0	22.0	1080	4 x 0.80	1.40	23.0	1410	1.60	1.40	24.0	1610	119	108	1000
35/16	Stranded △	0.9	0.7	0.3	2.0	24.0	1370	-do-	1.40	25.0	1725	1.60	1.40	26.0	1950	144	132	1000
50/25	Stranded △	1.0	0.9	0.3	2.0	27.5	1875	-do-	1.40	28.0	2325	1.60	1.56	29.0	2580	174	162	1000
70/35	Stranded △	1.1	0.9	0.4	2.2	31.0	2620	-do-	1.56	32.0	3110	2.00	1.56	34.0	3560	210	198	500
95/50	Stranded △	1.1	1.0	0.4	2.2	35.0	3475	-do-	1.56	36.0	8975	2.00	1.56	37.5	4525	252	240	500
120/70	Stranded △	1.2	1.1	0.4	2.2	39.0	4315	-do-	1.72	40.0	4960	2.00	1.72	41.0	5460	288	276	500
150/70	Stranded △	1.4	1.1	0.5	2.4	43.0	5220	-do-	1.72	44.0	5870	2.00	1.88	45.0	6570	324	318	500
185/95	Stranded △	1.6	1.1	0.5	2.6	48.0	6575	-do-	1.88	50.0	7275	2.50	2.04	50.0	8520	360	366	500
240/120	Stranded △	1.7	1.2	0.6	2.8	54.0	8400	-do-	2.04	55.0	9300	2.50	2.20	56.0	10650	414	426	500
300/150	Stranded △	1.8	1.4	0.6	3.0	57.0	10500	-do-	2.20	58.0	11500	2.50	2.36	61.0	12400	462	480	500
400/185	Stranded △	2.0	1.6	0.7	3.4	65.0	13820	-do-	2.52	66.0	14720	3.15	2.68	70.0	16875	510	546	250

The above data is approximate and subject to manufacturing tolerance.

* Delivery Length tolerance is ± 5 %. Length more than normal as per customer request.

POLYCAB WIRES & CABLES
AN ISO 9001:2000 COMPANY

TABLE-9 "POLYCAB" FOUR CORE ALUMINIUM CONDUCTOR, XLPE INSULATED,

UNARMOURED & ARMOURED CABLE CONFORMING TO IS 7098 PART-1/1988

650/1100 VOLTS

WEIGHT AND DIMENSIONS

Nominal Size of Conductor	Form of Conductor Circular Shaped ○/△	Nominal Thickness of XLPE Insulation	Minimum Thickness of PVC Inner Sheath	Unarmoured Cable			Formed Wire/ Strip Armoured Cable				Round Wire Armoured Cable				Current Rating.		*Normal Delivery Length.
				Nominal Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx. Weight of Cable.	Nominal Dimension of GI Flat Strip.	Minimum Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx. Weight of Cable.	Nominal Dimension of GIRound Wire.	Minimum Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx. Weight of Cable.	In Ground.	In Air	
Sq.mm.	mm	mm	mm	mm	mm	Kgs./Km	mm	mm	mm	Kgs./Km	mm	mm	mm	Kgs./Km	Amps.	Amps.	Mtrs.
4	Solid ○	0.7	0.3	1.8	15.0	160	-NA-	-NA-	-NA-	-NA-	1.40	1.24	16.5	510	34	31	1000
4	Stranded ○	0.7	0.3	1.8	16.0	180	-NA-	-NA-	-NA-	-NA-	1.40	1.24	17.5	560	34	31	1000
6	Solid ○	0.7	0.3	1.8	16.5	200	-NA-	-NA-	-NA-	-NA-	1.40	1.24	17.5	580	43	50	1000
6	Stranded ○	0.7	0.3	1.8	17.5	215	-NA-	-NA-	-NA-	-NA-	1.40	1.24	18.5	625	43	50	1000
10	Solid ○	0.7	0.3	1.8	18.0	250	-NA-	-NA-	-NA-	-NA-	1.40	1.40	19.0	700	57	67	1000
10	Stranded ○	0.7	0.3	1.8	18.5	260	-NA-	-NA-	-NA-	-NA-	1.40	1.40	20.5	765	57	67	1000
16	Stranded △	0.7	0.3	1.8	17.5	350	4 x 0.8	1.40	20.0	715	1.60	1.40	21.0	895	73	70	1000
25	Stranded △	0.9	0.3	2.0	21.0	550	-do-	1.40	23.0	940	1.60	1.40	25.0	1150	94	96	500
35	Stranded △	0.9	0.3	2.0	23.5	680	-do-	1.40	25.0	1050	1.60	1.40	26.5	1325	113	117	500
50	Stranded △	1.0	0.3	2.0	26.0	875	-do-	1.56	28.0	1280	1.60	1.56	29.5	1640	133	142	500
70	Stranded △	1.1	0.4	2.2	30.5	1200	-do-	1.56	32.0	1700	2.00	1.56	34.0	2175	164	179	500
95	Stranded △	1.1	0.4	2.2	33.5	1530	-do-	1.56	35.0	2100	2.00	1.72	38.0	2775	196	221	500
120	Stranded △	1.2	0.5	2.4	37.5	1850	-do-	1.72	39.0	2600	2.00	1.88	42.0	3250	223	257	500
150	Stranded △	1.4	0.5	2.6	42.0	2280	-do-	1.88	43.5	3000	2.50	2.04	47.0	4175	249	292	500
185	Stranded △	1.6	0.5	2.8	46.5	2800	-do-	2.04	48.0	3650	2.50	2.20	52.0	5000	282	337	500
240	Stranded △	1.7	0.6	3.0	52.5	3700	-do-	2.20	54.0	4700	2.50	2.36	57.5	6050	326	399	500
300	Stranded △	1.8	0.7	3.2	58.0	4600	-do-	2.36	59.5	5600	3.15	2.52	64.5	7850	367	455	500
400	Stranded △	2.0	0.7	3.6	65.5	6000	-do-	2.68	66.5	7000	3.15	2.84	71.5	9500	418	530	500

The above data is approximate and subject to manufacturing tolerance.

* Delivery Length tolerance is ± 5 %. Length more than normal as per customer request.

TABLE-10 "POLYCAB" FOUR CORE COPPER CONDUCTOR, XLPE INSULATED,

UNARMOURED & ARMOURED CABLE CONFORMING TO IS 7098 PART-1/1988

650/1100 VOLTS

WEIGHT AND DIMENSIONS

Nominal Size of Conductor	Form of Conductor Circular Shaped ○/△	Nominal Thickness of XLPE Insulation	Minimum Thickness of PVC Inner Sheath	Unarmoured Cable			Formed Wire/ Strip Armoured Cable				Round Wire Armoured Cable				Current Rating.		*Normal-Delivery Length.
				Nominal Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx. Weight of Cable.	Nominal Dimension of GI Flat Strip.	Minimum Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx. Weight of Cable.	Nominal Dimension of GI Round Wire.	Minimum Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx. Weight of Cable.	In Ground.	In Air	
Sq.mm.	mm	mm	mm	mm	mm	Kgs./Km	mm	mm	mm	Kgs./Km	mm	mm	mm	Kgs./Km	Amps.	Amps.	Mtrs.
4	Solid ○	0.7	0.3	1.8	15.0	260	-NA-	-NA-	-NA-	-NA-	1.40	1.24	16.5	610	43	36	1000
4	Stranded ○	0.7	0.3	1.8	16.0	280	-NA-	-NA-	-NA-	-NA-	1.40	1.24	17.5	660	43	36	1000
6	Solid ○	0.7	0.3	1.8	16.5	350	-NA-	-NA-	-NA-	-NA-	1.40	1.24	17.5	730	54	47	1000
6	Stranded ○	0.7	0.3	1.8	17.5	365	-NA-	-NA-	-NA-	-NA-	1.40	1.24	18.5	775	54	47	1000
10	Stranded ○	0.7	0.3	1.8	18.5	510	-NA-	-NA-	-NA-	-NA-	1.40	1.40	20.5	1010	72	62	1000
16	Stranded △	0.7	0.3	1.8	17.5	750	4 x 0.8	1.40	20.0	1050	1.60	1.40	21.0	1275	92	79	1000
25	Stranded △	0.9	0.3	2.0	21.0	1170	-do-	1.40	23.0	1520	1.60	1.40	25.0	1770	119	108	500
35	Stranded △	0.9	0.3	2.0	23.5	1550	-do-	1.40	25.0	1915	1.60	1.40	26.5	2190	144	132	500
50	Stranded △	1.0	0.3	2.0	26.0	2110	-do-	1.56	28.0	2510	1.60	1.56	29.5	2875	174	162	500
70	Stranded △	1.1	0.4	2.2	30.5	2925	-do-	1.56	32.0	3430	2.00	1.56	34.0	3900	210	198	500
95	Stranded △	1.1	0.4	2.2	33.5	3880	-do-	1.56	35.0	4450	2.00	1.72	38.0	5125	252	240	500
120	Stranded △	1.2	0.5	2.4	37.5	4825	-do-	1.72	39.0	5575	2.00	1.88	42.0	6225	288	276	500
150	Stranded △	1.4	0.5	2.6	42.0	6000	-do-	1.88	43.5	6710	2.50	2.04	47.0	7890	324	318	500
185	Stranded △	1.6	0.5	2.8	46.5	7380	-do-	2.04	48.0	8225	2.50	2.20	52.0	9580	360	366	500
240	Stranded △	1.7	0.6	3.0	52.5	9650	-do-	2.20	54.0	10340	2.50	2.36	57.5	12000	414	426	500
300	Stranded △	1.8	0.7	3.2	58.0	12025	-do-	2.36	59.5	13025	3.15	2.52	64.5	15275	462	480	250

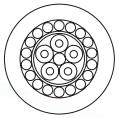
The above data is approximate and subject to manufacturing tolerance.

* Delivery Length tolerance is ± 5 %. Length more than normal as per customer request.

POLYCAB WIRES & CABLES
AN ISO 9001:2000 COMPANY

TABLE-11 "POLYCAB" 650/1100 VOLTS MULTICORE CONTROL CABLE WITH SOLID COPPER CONDUCTOR OF SIZE 1.5 SQ.MM XLPE INSULATED

UNARMOURED, ARMOURED CABLE CONFORMING TO IS 7098 PART - 1/1988



Solid & Stranded $

WEIGHT AND DIMENSIONS

Number of Cores	Nominal Thickness of XLPE Insulation	Minimum Thickness of PVC Inner Sheath	Unarmoured Cable			Formed Wire/ Strip Armoured Cable				Round Wire Armoured Cable				Current Rating.		*Normal Delivery Length.
			Nominal Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx. Weight of Cable.	Nominal Dimension of GI Flat Strip.	Minimum Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx. Weight of Cable.	Nominal Dimension of GI Round Wire.	Minimum Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx. Weight of Cable.	In Ground.	In Air	
No. s	mm	mm	mm	mm	Kgs./Km	mm	mm	mm	Kgs./Km	mm	mm	mm	Kgs./Km	Amps.	Amps.	Mtrs.
2	0.7	0.3	1.8	10.0	140	-NA-	-NA-	-NA-	-NA-	1.4	1.24	12.5	370	33	29	1000
3	-do-	0.3	1.8	10.5	160	-NA-	-NA-	-NA-	-NA-	1.4	1.24	13.0	390	25	22	1000
4	-do-	0.3	1.8	11.5	200	-NA-	-NA-	-NA-	-NA-	1.4	1.24	13.5	415	25	22	1000
5	-do-	0.3	1.8	12.5	225	-NA-	-NA-	-NA-	-NA-	1.4	1.24	14.5	465	24	21	1000
6	-do-	0.3	1.8	13.5	250	-NA-	-NA-	-NA-	-NA-	1.4	1.24	15.5	500	22	19	1000
7	-do-	0.3	1.8	13.5	260	-NA-	-NA-	-NA-	-NA-	1.4	1.24	15.5	520	21	18	1000
8	-do-	0.3	1.8	14.5	280	-NA-	-NA-	-NA-	-NA-	1.4	1.24	16.5	580	20	18	1000
9	-do-	0.3	1.8	15.5	315	-NA-	-NA-	-NA-	-NA-	1.4	1.24	17.5	630	19	17	1000
10	-do-	0.3	1.8	17.0	340	-NA-	-NA-	-NA-	-NA-	1.4	1.24	18.5	655	18	16	1000
12	-do-	0.3	1.8	17.5	390	-NA-	-NA-	-NA-	-NA-	1.4	1.24	19.0	720	17	15	1000
14	-do-	0.3	1.8	18.0	430	-NA-	-NA-	-NA-	-NA-	1.4	1.40	20.0	825	16	14	1000
16	-do-	0.3	1.8	18.5	475	4 x 0.80	1.40	19.0	750	1.6	1.40	21.0	925	16	14	1000
19	-do-	0.3	1.8	19.5	540	-do-	-do-	20.0	815	1.6	1.40	22.0	1010	15	13	1000
21	-do-	0.3	2.0	20.5	600	-do-	-do-	21.0	900	1.6	1.40	23.0	1150	14	12	500
24	-do-	0.3	2.0	22.5	665	-do-	-do-	23.0	1000	1.6	1.40	25.0	1250	13	12	500
27	-do-	0.3	2.0	23.0	750	-do-	-do-	23.5	1050	1.6	1.40	25.5	1330	13	11	500
30	-do-	0.3	2.0	23.5	820	-do-	-do-	24.0	1125	1.6	1.40	26.0	1400	12	11	500
33	-do-	0.3	2.0	24.0	910	-do-	-do-	25.0	1225	1.6	1.40	27.0	1475	12	10	500
37	-do-	0.3	2.0	25.0	975	-do-	-do-	26.0	1325	1.6	1.40	28.0	1550	11	10	500
44	-do-	0.3	2.0	28.0	1150	-do-	-do-	28.5	1500	1.6	1.56	30.5	1850	11	9	500
52	-do-	0.3	2.0	29.0	1300	-do-	1.56	30.5	1700	1.6	1.56	32.0	2050	10	9	500
61	-do-	0.4	2.2	31.0	1500	-do-	1.56	32.0	1950	2.0	1.56	34.5	2550	9	8	500

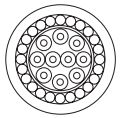
$ The Weight and Dimensions of Cables with Stranded conductor will be comparatively more than that of Solid conductor,whereas all other parameters are same..

The above data is approximate and subject to manufacturing tolerance.

* Delivery Length tolerance is ± 5 %. Length more than normal as per customer request.

TABLE-12 "POLYCAB" 650/1100 VOLTS MULTICORE CONTROL CABLE WITH SOLID COPPER CONDUCTOR OF SIZE 2.5 SQ.MMXLPE INSULATED

UNARMOURED, ARMOURED CABLE CONFORMING TO IS 7098 PART - 1/1988



Solid & Stranded $

WEIGHT AND DIMENSIONS

Number of Cores	Nominal Thickness of XLPE Insulation	Minimum Thickness of PVC Inner Sheath	Unarmoured Cable			Formed Wire/ Strip Armoured Cable				Round Wire Armoured Cable				Current Rating.		*Normal Delivery Length.
			Nominal Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx. Weight of Cable.	Nominal Dimension of GI Flat Strip.	Minimum Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx. Weight of Cable.	Nominal Dimension of GI Round Wire.	Minimum Thickness of PVC Outer Sheath	Approx. Overall Diameter of Cable.	Approx. Weight of Cable.	In Ground.	In Air	
No. s	mm	mm	mm	mm	Kgs./Km	mm	mm	mm	Kgs./Km	mm	mm	mm	Kgs./Km	Amps.	Amps.	Mtrs.
2	0.7	0.3	1.8	11.5	185	-NA-	-NA-	-NA-	-NA-	1.4	1.24	13.5	380	39	32	1000
3	-do-	0.3	1.8	12.0	220	-NA-	-NA-	-NA-	-NA-	1.4	1.24	14.0	425	34	30	1000
4	-do-	0.3	1.8	13.0	260	-NA-	-NA-	-NA-	-NA-	1.4	1.24	14.5	500	34	30	1000
5	-do-	0.3	1.8	14.0	300	-NA-	-NA-	-NA-	-NA-	1.4	1.24	15.5	525	31	28	1000
6	-do-	0.3	1.8	15.0	340	-NA-	-NA-	-NA-	-NA-	1.4	1.24	16.5	600	29	26	1000
7	-do-	0.3	1.8	15.0	360	-NA-	-NA-	-NA-	-NA-	1.4	1.24	16.5	625	27	25	1000
8	-do-	0.3	1.8	16.0	400	-NA-	-NA-	-NA-	-NA-	1.4	1.24	18.0	700	26	24	1000
9	-do-	0.3	1.8	16.5	450	-NA-	-NA-	-NA-	-NA-	1.4	1.40	19.5	800	25	22	1000
10	-do-	0.3	1.8	17.5	475	4 x 0.80	1.24	19.0	700	1.6	1.40	21.0	875	24	21	1000
12	-do-	0.3	1.8	18.0	550	4 x 0.80	1.40	19.5	760	1.6	1.40	21.5	975	22	20	1000
14	-do-	0.3	1.8	19.0	625	4 x 0.80	1.40	20.0	850	1.6	1.40	22.0	1050	21	19	1000
16	-do-	0.3	2.0	20.5	680	4 x 0.80	1.40	21.5	920	1.6	1.40	23.5	1160	20	18	1000
19	-do-	0.3	2.0	21.5	770	4 x 0.80	1.40	22.5	1025	1.6	1.40	24.5	1250	19	17	1000
21	-do-	0.3	2.0	22.5	860	4 x 0.80	1.40	23.5	1140	1.6	1.40	25.5	1350	18	16	500
24	-do-	0.3	2.0	24.5	950	4 x 0.80	1.40	25.5	1250	1.6	1.40	27.5	1500	17	16	500
27	-do-	0.3	2.0	25.5	1050	4 x 0.80	1.40	26.5	1350	1.6	1.40	28.5	1625	16	16	500
30	-do-	0.3	2.0	26.0	1150	4 x 0.80	1.40	27.5	1550	1.6	1.40	29.0	1760	16	14	500
33	-do-	0.3	2.0	27.0	1250	4 x 0.80	1.40	28.5	1630	1.6	1.56	30.5	1950	15	14	500
37	-do-	0.3	2.0	28.0	1350	4 x 0.80	1.40	29.5	1710	1.6	1.56	31.5	2080	15	13	500
44	-do-	0.4	2.2	32.0	1650	4 x 0.80	1.56	33.0	2100	2.0	1.56	35.5	2600	14	12	500
52	-do-	0.4	2.2	33.5	1950	4 x 0.80	1.56	34.5	2350	2.0	1.56	37.5	2900	13	12	500
61	-do-	0.4	2.2	35.0	2150	4 x 0.80	1.56	36.0	2625	2.0	1.56	39.0	3400	12	11	500

$ The Weight and Dimensions of Cables with Stranded conductor will be comparatively more than that of Solid conductor,whereas all other parameters are same..
The above data is approximate and subject to manufacturing tolerance.
* Delivery Length tolerance is ± 5 %. Length more than normal as per customer request.

POLYCAB WIRES & CABLES
AN ISO 9001:2000 COMPANY

1) FOR AIR AND GROUND TEMPERATURE

A. Rating factors for variation in ambient air temperature						
Ambient Temp (°C)	25	30	35	40	45	50
Rating Factors	1.14	1.10	1.04	1.00	0.95	0.90
B. Rating factors for variation in ground temperature						
Ground Temp (°C)	15	20	25	30	35	40
Rating Factors	1.12	1.08	1.03	1.00	0.96	0.91

2) FOR DEPTH OF LAYING (CABLES LAID DIRECT IN THE GROUND).

Depth of laying	Size		
Cm	Upto 25 mm^2	Above 25 mm^2 Upto 300 mm^2	Above 300 mm^2
75	1.0	1.00	1.00
90	0.99	0.98	0.97
105	0.98	0.97	0.96
120	0.97	0.96	0.95
150	0.96	0.94	0.92
180 or more	0.95	0.93	0.91

3) FOR VARIATION IN THERMAL RESISTIVITY OF SOIL (TWIN AND MULTICORE CABLES LAID DIRECT IN THE GROUND).

Nominal area of conductor mm^2	Two cables touching for values of Thermal Resistivity of soil in °C cm / W					
	100	120	150	200	250	300
1.5	1.10	1.05	1.00	0.92	0.86	0.81
2.5	1.10	1.05	1.00	0.92	0.86	0.81
4	1.10	1.05	1.00	0.92	0.86	0.81
6	1.10	1.05	1.00	0.92	0.86	0.81
10	1.10	1.06	1.00	0.92	0.85	0.80
16	1.12	1.06	1.00	0.91	0.84	0.79
25	1.14	1.08	1.00	0.91	0.84	0.78
35	1.15	1.08	1.00	0.91	0.84	0.77
50	1.15	1.08	1.00	0.91	0.84	0.77
70	1.15	1.08	1.00	0.90	0.83	0.76
95	1.15	1.08	1.00	0.90	0.83	0.76
120	1.17	1.09	1.00	0.90	0.82	0.76
150	1.17	1.09	1.00	0.90	0.82	0.75
185	1.18	1.09	1.00	0.89	0.81	0.75
240	1.18	1.09	1.00	0.89	0.81	0.75
300	1.18	1.09	1.00	0.89	0.81	0.75
400	1.19	1.10	1.00	0.89	0.81	0.75

FOR SINGLE CORE CABLES

A) Cables laid direct in the ground in horizontal formation.

No. of Trefoils in Group	Distance between Trefoils			
	Touching	15 cm	30 cm	45 cm
2	0.78	0.81	0.85	0.88
3	0.68	0.71	0.77	0.81
4	0.61	0.65	0.72	0.76
5	0.56	0.61	0.68	0.73

B) Cables laid in ducts in horizontal formation.

No. of Trefoils in Group	Distance between Trefoils		
	Touching	45 cm	60 cm
2	0.87	0.90	0.91
3	0.79	0.83	0.86
4	0.74	0.79	0.82
5	0.71	0.76	0.80

C) Cables laid on racks / Trays in covered trench with having restricted air circulation, Trefoils are separated by two cable diameter horizontally and the trays are in tiers having 30 cm distance.

No. racks / trays in tiers	No. of Trefoils in Horizontal Formation		
	1	2	3
1	0.95	0.90	0.88
2	0.90	0.85	0.83
3	0.88	0.83	0.81
6	0.86	0.81	0.79

D) as above C. but cables laid in open air.

No. racks / trays in tiers	No. of Trefoils in Horizontal Formation		
	1	2	3
1	1	0.98	0.96
2	1	0.95	0.93
3	1	0.94	0.92
6	1	0.93	0.90

FOR MULTI CORE CABLES

A) Cables laid on cable trays exposed to air, the cables spaced by one cable diameter and trays are in tiers spaced by 30 cm. The clearance between the wall and the cable is 25 mm.

No. of cables trays in tier	No. of Cables per Tray				
	1	2	3	6	9
1	1	0.98	0.96	0.93	0.92
2	1	0.95	0.93	0.90	0.89
3	1	0.94	0.92	0.89	0.88
6	1	0.93	0.90	0.87	0.86

B) Cables laid inside concrete trench with removable covers on cable trays having restricted circulation. The cables spaced by one cable diameter and trays are in tiers spaced by 30 cm. The clearance of the cable from the wall is 25 mm.

No. of cables trays in tier	No. of Cables per Tray				
	1	2	3	6	9
1	0.95	0.90	0.88	0.85	0.84
2	0.90	0.85	0.83	0.81	0.80
3	0.88	0.83	0.81	0.79	0.78
6	0.86	0.81	0.79	0.77	0.76

C) Cables laid on cable trays exposed to air, the cable touching and trays are in tiers spaced by 30 cm. The clearance between the wall and the cable is 25 mm.

No. of cables trays in tier	No. of Cables per Tray				
	1	2	3	6	9
1	1	0.84	0.80	0.75	0.73
2	1	0.80	0.76	0.71	0.69
3	1	0.78	0.74	0.70	0.68
6	1	0.76	0.72	0.68	0.66

D) Cables laid direct in ground in horizontal formation.

No. of cables in Group	Distance of Cables			
	Touching	15 cm	30 cm	45 cm
2	0.79	0.82	0.87	0.90
3	0.69	0.75	0.79	0.83
4	0.62	0.69	0.74	0.79
5	0.58	0.65	0.72	0.76
6	0.54	0.61	0.69	0.75

E) Cables laid in single way ducts / pipes in horizontal formation.

No. of cables in Group	Distance of Cables			
	Touching	30 cm	45 cm	60 cm
2	0.88	0.90	0.92	0.94
3	0.82	0.84	0.87	0.89
4	0.77	0.80	0.84	0.87
5	0.74	0.78	0.82	0.85
6	0.71	0.76	0.81	0.84

POLYCAB WIRES & CABLES
AN ISO 9001:2000 COMPANY

A. CABLE INSPECTION

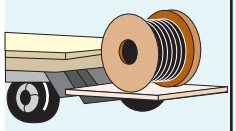
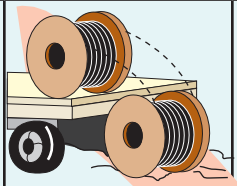
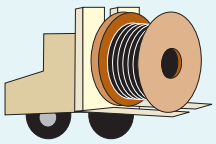
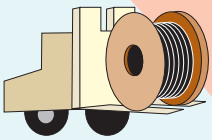
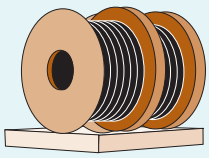
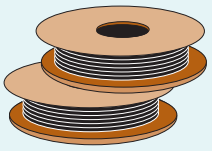
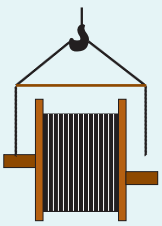
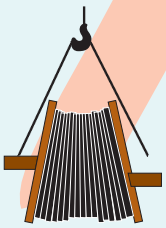
Inspect every cable reel for damage before accepting the shipment.Be particularly alert for cable damage if:

1. A reel is lying flat on its side
2. Several reels are stacked
3. Other freight is stacked on a reel
4. Nails have been driven into reel flanges to secure shipping blocks
5. A reel flange is damaged
6. A cable covering is removed, stained or damaged
7. A cable end seal is removed or damaged. A reel has been dropped (hidden damage likely)

B. CABLE HANDLING & STORAGE

Damage to cables can occur due to the incorrect handling to which the drums and cables may be subjected; causing breakdown of the drum flanges and in exceptional cases, movement of the drum barrel takes place. Once this breakdown of the drum occurs, the cable is immediately exposed to damage. Cables damaged during handling & storage can cause service failures when the subject cable is put to use.

Thus the following is a list of Do's and Don'ts that should be followed while handling and storing the cables before it is put to use.

Do's		Don'ts	
	When off loading reels from a truck, lower reels carefully using a hydraulic gate, hoist or forklift truck		Never drop reels. If reels must be rolled, roll in opposite direction of the cable wraps to keep cable from loosening on the reel.
	If a fork lift is used, approach the reel from the flange side. Position the forks such that the reel is lifted by both reel flanges. Also Consideration should be given to, Traffic patterns during off-loading & damage during the time in storage		Do not allow the lift forks to contact the cable. Care must be taken by the fork lift operator not to make sudden turns or stops.
	Cable reels should be stored on hard surfaces resting on the flanges edge (flanges vertical). Align reels flange to flange and, if possible, arrange so that first in is first out.		Multiple reels stacked on top of each other ("Pancake" storage) is not recommended for cable drums. The weight of the stack can total thousands of kgs. creating an enormous load on the bottom reel. Also, damage to the reel and/or cable will likely occur when the reel is flipped for transit. A concentration of stress on the reel flange may cause it to break and subsequently damage the cable.
	When using a hoist, install a mandrel through the reel arbor holes and attach a sling. Use a spreader bar approximately 6 inches longer than the overall reel width placed between the sling ends just above the reel flanges.		This may lead to the bending of the reel flanges and mashing the cable

C. PRE- INSTALLATION

To ensure safety during cable installation, following shall be checked prior to installation.

1. The cable selected is proper for designed application.
2. The cable has not been damaged in transit or storage.

Review all applicable state and national codes to verify that the cable chosen is appropriate for the job. Also consult your local electricity authority. Next, you must identify any existing cable damage and prevent any further damaged from occurring. This is done through proper cable inspection, handling and storage.

D. INSTALLATION & LAYING

Mechanical stresses during installation are generally more severe than those encountered while in service. Thus care should be taken as regards to the following while installation and laying of cables.

1. Polycab recommend the laying and installation of cables as per IS: 1255/84.
2. Care shall be taken during laying to avoid sharp bending, and twisting.
3. Cable shall be un wound from the drum by lifting the drum on the center
4. Shaft supported both ends with suitablejacks / stands.
5. Under no circumstances the cable winding shall be lifted off a coil or drum lying flat at the flanges. This would cause serious twist and damages.
6. Suitable protection shall be provided to the cables against mechanical damages, it includes covers, pipes etc.

E. RECOMMENDED MINIMUM BENDING RADIUS FOR HEAVY DUTY CABLES.

Single Core : 20 x D

Multicore : 15 x D

Where D = Diameter of cable in mm

F. RECOMMENDED SAFE PULLING FORCE WITH STOCKINGS:

a) For Unarmoured Cable : $P = 5\ D2$

b) For Armoured Cable : $P = 9\ D2$

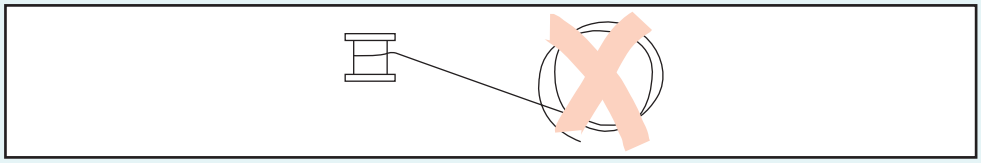
Where P = Pulling Force
Where D = Diameter of cable in mm

G. RECOMMENDED SAFE PULLING FORCE WHEN PULLED WITH PULLING EYE :

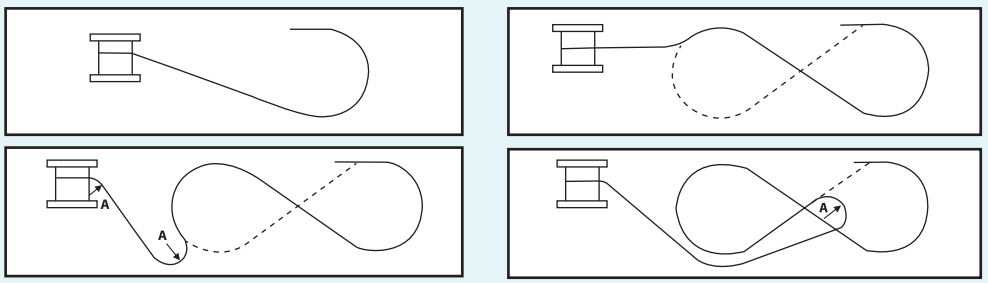
a) For Aluminium Conductor : 30 N/mm^2

b) For Copper Conductor : 50 N/mm^2

DO NOT ATTEMPT "COILING" OF CABLE ON THE GROUND



ON THE GROUND CABLE CAN BE FLAKED IN A FIGURE OF EIGHT FORMATION



Note: R Minimum Permissible bending radius of cable.



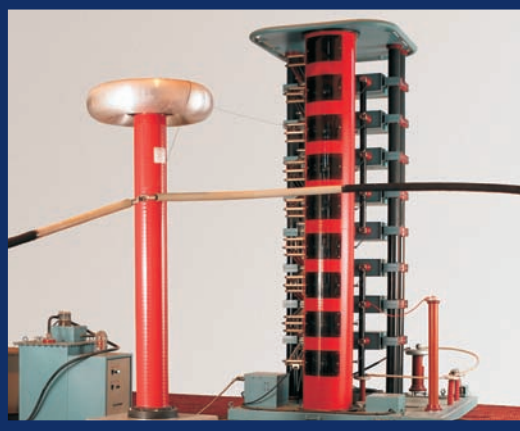












Production Facilities at Daman Factory

POLYCAB REGIONAL OFFICES

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Wiring the World

POLYCAB®
WIRES & CABLES

POLYCAB WIRES PVT. LTD.

(an ISO 9001:2000 Company)

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Fax : 91-22-2432 7075

E-mail : info@polycab.com
Website : www.polycab.com

ABOUT US

From a modest beginning with Conductors, Compounds and Wires & Cables, almost three decades ago, the Polycab Group Set up a State of Art manufacturing facilities at Daman in 1997, to address key market determinants. Starting the project from scratch Polycab was able to design a manufacturing facility around State of Art disciplines of Computer integrated manufacture .The Quality & Manufacturing setup is sourced out from the World renowned Machinery and Technology Suppliers with constant upgradations and expansions.

At POLYCAB, We study the requirements of the penultimate users with our commitment for Quality and Value. These are converted into process specifications based on Indian & International Standards.

In India with economic reforms and gradual opening of economy to the global system, the Power sector has become one of the key areas of attention of everybody concerned.

Efficient and dependable power system being the requisite, **Aerial Bunched Cable** is the item which is receiving attention of all public sector as well as private sector power distributors. It is expected that in the coming years, use of aerial bunched cables will rise phenomenally all over India.

EXPERIENCE:

After extensive research Polycab has successfully developed and introduced Aerial Bunched Conductor Cables, and have already achieved technical competence, manufacturing ability, and marketing experience by supplying ABC cables to the following Customers: -

1. **BSES LTD (for Gridco – Orissa)**
2. **North Delhi Power Ltd - Delhi**

TAILOR MADE DESIGN

POLYCAB have recognized the need for H.T & L.T ABC cables in the emerging market due to thrust in the Transmission & Distribution network revamping programme by Govt. of India. **We can interact with you to design for you H.T. & L.T. Aerial Bunched Cables to meet your specific requirements.**

AERIAL BUNCHED CABLES

INTRODUCTION

Aerial Bunched Cable (ABC) is a very novel concept for Over Head power distribution. When compared to the conventional bare conductor over head distribution system, ABC provides higher safety and reliability, lower power losses and ultimate system economy by reducing installation, maintenance and operative cost. This system is ideal for rural distribution and specially attractive for installation in difficult terrains such as hilly areas, forest areas, coastal areas etc.

ABC is also considered to be the best choice for power distribution congested urban areas with narrow lanes and by-lanes. In developing urban complex, ABC is the better choice because of flexibility for rerouting as demanded by changes in urban development plan. Aerial bunched cable system is specially suited in limited space conditions like densely populated areas where laying of underground cables is impossible or extremely expensive

Most of the faults in overhead power supply systems occur due to failure in transmission lines, whether these are HT or LT, resulting in immense loss and inconvenience to consumers. The main weakness of overhead lines are that its power carrying conductors are bare.

To overcome the above deficiency, Aerial Bunched Cable systems have been introduced at many places across the world for both HT and LT systems. Principally, the system is a compromise between insulated power cable systems and bare overhead conductor systems. As far as basic construction goes, there are three or four power carrying conductors suitably insulated and laid around a bare or insulated weight-carrying conductor, which also serves as earth/neutral conductor. The cable is then hanged on transmission poles/towers suitably. Since the cores are insulated the chances of faults reduces to a great extent. While it lacks the mechanical strength and safety of underground cables, the very fact that it is hanged overhead enables it to avoid mechanical abuses that an underground cable is normally subjected to.

In comparison to bare overhead lines, aerial bunched cable has very high degree of safety and reliability due to the conductors being insulated with the best dielectric medium. This ensures good protection against ground and line faults leading to considerable increase in system efficiency as against bare overhead lines. The problem of free-clearance is also minimized.

Tampering with power-line like hooking also gets eliminated, resulting in much more efficient utilization of power.

HT AERIAL BUNCHED CABLES

While specifically talking about HT Aerial Bunched Cables, these are basically three single cored unarmored cables laid around a weight carrying conductor which also serves as an earth or neutral conductor.

TYPICAL CONSTRUCTIONAL DETAILS (H.T. ABC):

POWER CORES

Conductor: Composed of H2/H4 grade Aluminium to class 2 grade of IS 8130 or IEC 60228 or other equivalent standards. It can be from 35 mm^2 to 300 mm^2.

Conductor Screen: (applicable for cables above 3.3 kV grade)

Extruded semiconducting layer as per IS 7098 (Part 2) or IEC 60502 or any other equivalent international standard.

Insulation: Typically this may be XLPE insulation as per IS 7098 (Part 2) or IEC 60502 which gives both material property as well as thickness level required.

Insulation screen: Wherever applicable (mostly 6.6 kV onwards) it comprises of an extruded layer of semiconducting material followed by a metallic tape (mostly copper).

Jacket: ST2 grade PVC to IS 5831.

MESSENGER WIRE

This typically consists of either strands of Aluminium alloy wire to IS 398 (Part) or galvanized steel wire to BS 183 as chosen by the customer. It may have a jacket similar to Power cores.

Core identification: By printing numbers 1,2,3 on the jackets of Power cores and 0 on the jacket of messenger core.

We can supply the cable to other international standards like IEC, BS, etc or to customers own specifications and needs.

POLYCAB WIRES PVT. LTD.

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E-mail: polycab@vsnl.com Internet: www.polycab.com

POLYCAB
WIRES & CABLES

POLYCAB

Flame Retardant (FR)

Flame Retardant Low Smoke & Halogen (FRLS-H)

Fire Resistant (Fire Survival) &

Low Smoke Halogen Free Cables

POLYCAB
WIRES & CABLES

Introduction

Cables are the source of carrying power and signal in power plants, refineries, process industries. Cable network can carry fire from one place to another in the event of fire caused due to external sources or due to short circuit.

Experience reveals that electrical cables are the prime source of propagation of fire. It is also experienced that damage to property and human life due to this phenomenon needs to be given due importance and the cables shall be selected considering fire and safety requirements of circuit integrity during fire conditions. It includes emergency Power Supply, Alarm Power Supply and other critical applications.

Cables used in enclosed areas such as Power Plants, Buildings, Housing Complex, Multiplexes, Underground Railways, Road Tunnels, Hospitals shall be Flame Retardant. Flame Retardant Low Smoke & Halogen or Low Smoke & Halogen Free or Fire Resistant (Fire Survival Cables) used for critical applications.

POLYCAB manufactures these types of cables having constructions as per standard specifications – IS:1554, IS:7098, IEC:60502, BS:5467, BS:6746, BS:6622 & BS:7835 up to 33 kV.

POLYCAB FR CABLES

meets standard requirements of

- ❖ IS-10810 Pt. 62 All categories/IS-1554-FR
- ❖ IS-10810 Part 61 / IS-1554, IS-694
- ❖ IEEE – 383
- ❖ ASTM-D-2863
- ❖ IEC-60332 Part 1 & 3
- ❖ SS-4241417

Flame Retardant Cables are those which retards flame in the event of fire. These are normally used in buildings, process plants, refineries and substations.

ADVANTAGES OF POLYCAB F R CABLES

- Does not allow fire propagation in single cable.
- Does not propagate fire when cables are laid in bunch or in trays
- Extinguishes flame immediately after fire temperature goes down

CONSTRUCTION – F R CABLES

1. **Conductor**: Annealed Plain / Annealed Tinned Copper / Aluminium - IS:8130 / IEC 60228 / BS 6360.
2. **Insulation**: PVC as per IS:1554, IEC-60502/BS 6746 OR XLPE as per IS:7098, IEC-60502/BS 5467, BS 6622.
3. **Inner Sheath/Bedding**: ST1/ST2 PVC, FR PVC, IS / IEC 60502.
4. **Armouring**: Unarmoured / Galvanized Steel (***or Aluminium*** for Single Core) Round / Strip Armoured to IS:3975/IEC-60502, BS 6746/5467/6622.
5. **Outer Sheath**: FR PVC ST1/FR PVC ST2.
6. **FR Properties**: IEC-60332-1 & 3 SS-4241417, IEEE-383, ASTM-D-2863.

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POLYCAB
WIRES & CABLES

POLYCAB FRLS CABLES

meets standard requirements of

- IS-10810 Part 62 / IS-1554
- IS-10810 Part 61 / IS-1554
- IEC-60332 Part 1 & 3
- SS-4241417
- IEEE – 383
- ASTM-D–2843 & D-2863
- IEC – 60754 - 1

Flame Retardant Low Smoke Cables are designed specially for Power Plants, public premises such as Cinemas, Multiplexes, theaters, Airports, Hospitals, Super Markets and underground railway, where risk to human life due to fire and smoke is high.

Human life gets endangered due to smoke and suffocation in the event of fire.

Polycab FRLS-H cables are manufactured with special PVC outer sheath which is formulated for Lower smoke and Halogen content.

ADVANTAGES OF POLYCAB FRLS - H CABLES

- Does not allow fire propagation in single and multi layered or bunched cables.
- Does emit limited smoke in case of fire.
- Does emit limited toxic and halogen gases
- Does have high temperature index.

CONSTRUCTION – FRLS CABLES

1. **Conductor**: Annealed Plain / Annealed Tinned Copper / Aluminium - IS:8130 / IEC 60228 / BS 6360.
2. **Insulation**: PVC as per IS:1554, BS IEC-60502/BS 6746 OR XLPE as per IS:7098, IEC-60502/BS 5467.
3. **Inner Sheath/Bedding**: ST1/ST2 PVC, FRLS PVC, IS/IEC.
4. **Armouring**: Unarmoured / Galvanized Steel (***or Aluminium*** for Single Core) Round / Strip Wire Armoured to IS:3975/IEC-60502, BS 6746/5467.
5. **Outer Sheath**: FRLS PVC ST1 / FRLS PVC ST2, IS/IEC.
6. **FRLS Properties**: IEC-60332-1 & 3, IEC-60754-1, SS-4241417, IEEE-383, ASTM-D-2863, ASTM-D-2843.

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POLYCAB HALOGEN FREE CABLES

meets standard requirements of

- IS-9968-1, 7098
- BS-6724, 7655
- IEC-60502-1, 60332-1,2,3, 60754-2
- SS-4241417
- IEEE – 383
- ASTM-D–2843 & D-2863

LSZH (Low Smoke Zero Halogen), LSOH (Low Smoke Zero Halogen), ZHFR (Zero Halogen, Flame Retardant) are the common nomenclature of cables which are latest in the design and are invariably recommended by various consultants and users for high human safety requirement in case of fire.

These Halogen Free Cables does not emit toxic gases and hence does not suffocate human beings during fire, causing fire fighting easy and reducing risk to human life.

These cables are invariably used in underground transport / Railway, and are recommended of all such areas where fire associated risk to human life is more.

ADVANTAGES OF POLYCAB LSZH / LSOH / ZHFR CABLES

- Does not allow fire propagation in single and multi layered or bunched cables.
- Does emit limited smoke in case of fire.
- Does not emit toxic gases hence safe to human and electronic equipments
- Low and white smoke does not effect visibility in enclosed areas
- All cable components are non-toxic, having low emission of smoke and acidic nature.

CONSTRUCTION – LSZH / LSOH / ZHFR CABLES

1. **Conductor**: Annealed Plain / Annealed Tinned Copper / Aluminium - IS:8130 / IEC 60228 / BS 6360.
2. **Insulation**: XLPE, EPR, Silicon as per IS:9968-1, IS 7098, BS:6724 & IEC – 60502, BS - 7846
3. **Inner Sheath/Bedding**: Low smoke Zero Halogen / Flame Retardant Compound.
4. **Armouring**: Unarmoured / Galvanized Steel (***or Aluminium*** for Single Core) Round / Strip Wire Armoured to IS:3975/IEC-60502, BS 6724.
5. **Outer Sheath**: Low smoke Zero Halogen / Flame Retardant Compound.
6. **Properties**: IEC-60332-1 & 3, SS-4241475, IEEE-383, ASTM-D-2863, ASTM-D-2843, IEC-60754-1, BS:7655.

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POLYCAB FIRE RESISTANT / FIRE SUR-VIVAL CABLES

meets Standard Requirements of

- BS-7846, 7655
- BS-6387 Category ABC & XYZ
- IEC-60331, 60332 Part 1 & 60332 Part 3

The cables which are used in the Power, Control or Signal Circuit of emergency equipments shall be Fire Resistant to ensure higher safety and performance in the event of fire.

These critical equipments connected with the cable such as Alarm, Lift Power Supply, Emergency, Lights, exit lights, water spray system and other important functions.

ADVANTAGES OF POLYCAB FIRE RESISTANT (FIRE SURVIVAL) – FS CABLE

- Maintains the circuit in operation for few hours to ensure emergency operation in the event of fire.
- Ensures Power availability during fire.
- Can save life and damages in the event of fire.
- Does not emit toxic gases hence safe to human and electronic equipments
- Low and white smoke does not effect visibility in enclosed areas
- All cable components are non-toxic, having low emission of smoke and acidic nature.

CONSTRUCTION – FIRE RESISTANT / FIRE SURVIVAL CABLES

1. **Conductor**: Annealed Plain / Tinned Copper / Aluminium - IS:8130 / IEC 60228/ BS 6360.
2. **Fire Barrier**: Layers of Glass Mica Tape.
3. **Insulation**: EPR or XLPE or Silicone Rubber.
4. **Fire Barrier Tape**: Glass Tape
5. **Inner sheath**: FRLS / LSZH
6. **Armour** : IS: 3975, BS: 7846
7. **Outer Sheath**: FRLS PVC ST 2, LSZH / LSOH.

Fire Resistant or Fire Survival Cables shall be with LSZH / LSOH / ZHFR sheathing for better performance under fire.

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POLYCAB
WIRES & CABLES

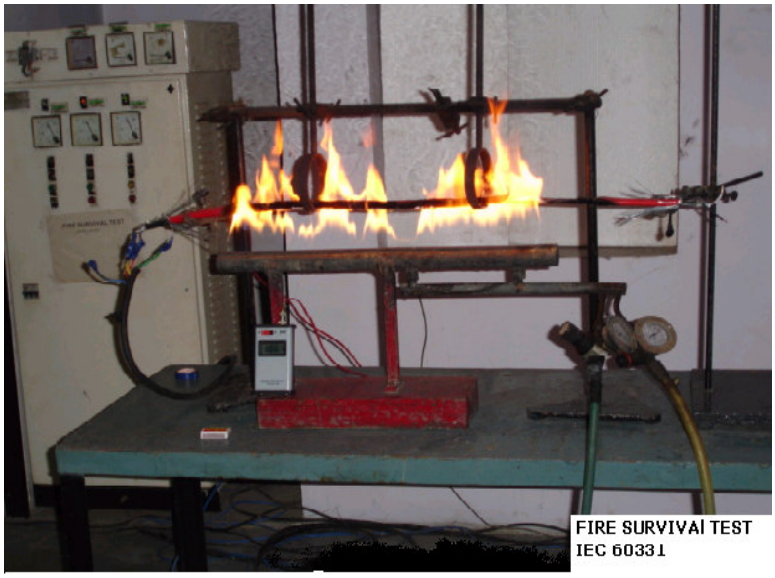
Performance Characteristics of Different Types of Cables under Fire

Sl. No.	Cable Type	Fire Characteristics	Application	Properties
01	PVC Cables XLPE Cable	Flame Retardant (FR)	Where flame retardance is desirable, but smoke and acid gas evolution is not considered to pose a serious hazard.	IEC – 60332 – 1, 332 – 3 SS-4241417, ASTM-D-2863 – Limiting Oxygen Index – Min. 29%
02	Low emission PVC Cables, XLPE Cables	Flame Retardant, Low Smoke & Reduced Halogen (FRLS-H)	In situations where reduced levels of smoke and corrosive gases are needed, compared to ordinary PVC or chlorinated polymer based cables.	IEC – 60332 – 1, 60332 – 3, SS – 424 – 1417 ASTM-D-2843, Smoke Density Rating:Max. 60% ASTM-D–2863,Limiting Oxygen Index:Min.29% IEEE-60754–1 (Max. HCL Gas Emission): 20%)
03	Low Fire Hazard Low Smoke, Zero Halogen. (LSOH)	Flame Retardant Low smoke & Acid Gas Emission.	For installation in areas where smoke and acid gas evolution could pose a hazard to personnel or sensitive equipment, but where circuit integrity is not needed.	IEC – 60332 – 1, 60332 – 3, SS – 424 – 1417 ASTM-D-2843, Smoke Density Rating: Max.20% IEC-61034, Min. Light Transmission: 70% ASTMD–2863,Limiting Oxygen Index:Min. 30% IEC-60754-2, Max. HCL : 0.5% Toxicity Index: Less than 5 NES 713, BS – 6724
04	Limited Circuit Integrity reduced hazard - Halogen contents (FRLS, FS)	Fire Resistance / Fire Survival / Flame Retardant Low Smoke (FRLS-H) & Reduced Halogen	For maintaining essential circuits such as emergency lighting and fire alarms for shorter time periods. Increased hazard from smoke and acid gas emission.	IEC – 60331, 60332 – 1, 60332 – 3, SS – 424 – 1417 ASTM-D-2843, Smoke Density Rating: 60% ASTM-D–2863, Limiting Oxygen Index: Min. 29% IEEE-60754–1 (Max. HCL Gas Emission): 20%)
05	Limited Circuit Integrity – Low Fire & Gas Hazards. (FS Cable, (LSOH)	Fire Resistant / Fire Survival / Flame Retardant Low Smoke & Zero Halogen.	For maintaining essential circuits such as emergency lighting and fire alarms for shorter time periods. Reduced hazard from cable combustion.	IEC – 60331, 60332 – 1, 60332 – 3, SS – 424 – 1417 ASTM-D-2843, Smoke Density Rating: Max.20% IEC-61034, Min. Light Transmission: 70% ASTMD–2863, Limiting Oxygen Index: Min. 30% IEC-60754-2, Max. HCL : 0.5% Toxicity Index: Less than 5 NES 713, BS – 7846, BS – 6387

POLYCAB
WIRES & CABLES

IMPORTANT TESTS

TESTS TO ENSURE CIRCUIT INTEGRITY AS PER IEC - 60331



Test Procedure:

The test sample is exposed to flame for 3 hrs. at 750 °C with rated voltage being applied to cable.

3 Amps. fuses shall not blow off.

Test Equipment:

Horizontal burner (Flame source) with sample support arrangement.

SMOKE DENSITY TEST AS PER ASTM D-2843

Test Procedure:

The test sample is exposed to flame at a 40 psi pressure for 4 minute, the light absorption data are plotted on a graph as time versus smoke density (%).

Test Equipment:

Smoke density Chamber with specimen holder, Ignition system and photometric system complete.

SWEDISH CHIMNEY TEST
AS PER SS – 424 1417

Test Procedure:

Measured quantity of ethanol is used to create flame which is applied on 850 mm. long cable for a calculated time and the un-burnt lengths from the top is measured.

Test Equipment:

Vertical Steel Tube with rectangular openings, lid and conical tray for ignition fluid.

OXYGEN INDEX TEST
AS PER ASTM-D-2863

Test Procedure:

Test sample 7 to 15 cm long by 6.5 $\pm$ 0.5 mm wide over 3 $\pm$ 0.5 mm thick in a minimum concentration of oxygen in a N_2 + O_2 mixture just support candle like burning at room temperature.

Test Equipment:

Oxygen Analyser, Flame source, Oxygen & Nitrogen gas supply and measuring flow meter.

Get in Touch with Us

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