



THE ART OF LIGHTING

**ELECTROLITE**

Wires & Cables

THE NAME OF TRUST & QUALITY

IS:694



IS:7098



IS:14255





## **PRODUCT RANGE**

- ⚡ L. T. PVC COPPER / ALUMINIUM SINGLE CORE UNARMoured CABLES UPTO 630 SQ. MM.**
- ⚡ L. T. XLPE COPPER / ALUMINIUM ARMoured & UNARMoured POWER CABLES.**
- ⚡ L. T. XLPE COPPER / ALUMINIUM ARMoured & UNARMoured CONTROL CABLES.**
- ⚡ PVC FLEXIBLE & MULTICORE CABLES.**
- ⚡ PVC BUILDING WIRE / FR / FRLS.**
- ⚡ SUBMERSIBLE FLAT CABLES.**
- ⚡ DWA PVC MINING CABLES.**
- ⚡ AERIAL BUNCHED CABLES.**

## ABOUT ELECTROLITE CABLE

“**Electrolite Cable Industries**” feels proud to introduce itself as one of the leading manufacturers of world class quality cables in India having a huge setup at Dist. Thane, (Maharashtra) India. We are involved in cables & conductors manufacturing under the name of ‘**Electrolite Cable**’ meeting stringent manufacturing and quality standards to satisfy demanding users in Power Generation & Distribution both in Government and private sector.

‘**Electrolite Cable**’ are tested and approved by Bureau of Indian Standards and we have been granted the below mentioned licenses of Indian Standards to mark our cables as ‘ISI’- the renowned and most acceptable quality in India :-

S. No	Description	License
1.	L.T. PVC insulated Wires & Cables	IS : 694 2010
2.	L.T. XLPE Control & Power Cables	IS : 7098 (P-1) 1988
3.	Aerial Bunched Cables	IS : 14255

We started with a vision to revolutionize the industry by offering high quality products at competitive prices. The combination of cutting edge technology and pro-active client services has helped us to meet the exacting requirements of our clients and the industry standards.

We have an excellent in-house manufacturing facility with the latest state of the art machineries that confirms to National (BIS) & International standards. “**Electrolite Cable Industries**” is an established project management organization with qualified Engineers covering all the areas towards satisfactory execution of orders by the way of timely supply of best quality materials. At all times, highest quality not only in materials but in service too remains our principle.

Continuous product innovation and with regular up gradation of production process ‘**Electrolite Cable**’ has achieved brand name in the Domestic & International Market. Due to its overall price competency and quality to suit customer's requirement, today ‘**Electrolite Cable**’ serves reputed organizations.

Our motto is to provide Unfailing & Dependable power transmission. ‘**Electrolite Cable**’ is known for its Quality, Durability & Reliability. We believe in our customer's delight and strive to serve with smile.

## Quality Assurance

In the manufacture of Cables, sincere efforts and standards laid down operating procedures at each and stage are followed to achieve quality. For quality end products; control starts from proper design of the product All raw materials are selected carefully and only materials of high quality are used in production. Having done this, stage wise inspection is done to ensure conformity with the requirements of relevant Indian / International Standards where these apply.

<b>Stage wise Inspection</b>	<b>i) Wire Drawing :</b>	<ul style="list-style-type: none"> <li>● Wire diameter</li> <li>● Surface</li> <li>● Shape</li> <li>● Quality of joints in the wire</li> </ul>
	<b>ii) Stranding of Wires :</b>	<ul style="list-style-type: none"> <li>● Quality of joints in the wire</li> <li>● Compaction of conductor</li> <li>● Shape of Conductor</li> <li>● Dimensions</li> <li>● Resistance of Conductor</li> <li>● Direction of Lay</li> </ul>
	<b>iii) Insulation :</b>	<ul style="list-style-type: none"> <li>● Dimension over insulation</li> <li>● Thickness of insulation</li> <li>● Surface defects</li> </ul>
	<b>iv) Curing : (for XLPE Insulation)</b>	<ul style="list-style-type: none"> <li>● Hot set test, Tensile strength &amp; Elongation test</li> </ul>
	<b>v) Laying Up :</b>	<ul style="list-style-type: none"> <li>● Sequence of Cores</li> <li>● Direction of lay</li> <li>● Diameter over laid up cores</li> <li>● Circularity</li> </ul>
	<b>vi) Inner Sheath :</b>	<ul style="list-style-type: none"> <li>● Thickness of Sheath</li> <li>● Diameter over Sheath</li> <li>● Surface Uniformity</li> <li>● Circularity</li> <li>● Porosity</li> </ul>
	<b>vii) Armouring :</b>	<ul style="list-style-type: none"> <li>● Diameter of Wires</li> <li>● Dimensions of Strips</li> <li>● Direction of lay</li> <li>● Coverage</li> <li>● Quality of Joints of Wires</li> </ul>
	<b>viii) Outer Sheath :</b>	<ul style="list-style-type: none"> <li>● Thickness of Sheath</li> <li>● Diameter over Sheath</li> <li>● Tightness of Sheath</li> <li>● Ovality, Eccentricity, Porosity, Embossing</li> </ul>

## **MANUFACTURING OF CABLES**

Cables with Aluminium & Copper conductor and polymer insulation are manufactured at Dist. Thane, (Maharashtra) India. Under the brand name of ELECTROLITE CABLE. ELECTROLITE cables comprise of conductors, insulation, screening (wherever applicable) inner sheath, armour and outer sheath.

The brief description of the process is mentioned as under :

### **CONDUCTOR**

ELECTROLITE Cables are available with both aluminium and copper conductors.

ELECTROLITE Cables are manufactured with solid / Stranded Circular / Shaped Aluminium / Copper conductor.

Stranding makes Cables flexible and easy to handle while shaping makes them compact.

Compaction is provided to all stranded conductor constructions as under :

1. Circular Conductor: With one wire in the centre conductor contains 6, 12, 18, 24, 30 wire layers in either unilay or opposite helical directions. The conductor is sized to approx. 90% compaction.
2. Shaped Conductors: In all multicore cables from 16 sq. mm size, conductors are “shaped” Compaction degree in multicore power cables is approx. 84% to 90%

ELECTROLITE Copper conductor cables are of the same construction that of cables with Aluminium conductor except for high tensile strength, superior conductivity, better flexibility and ease of jointing. Copper cables are used in control, instrumentation, winding, submarine, mining, signaling, airport lighting and ship wiring applications.

All conductors for ELECTROLITE Cables are manufactured strictly in accordance with B.I.S. specifications.

### **DIELECTRIC INSULATION**

Insulation for ELECTROLITE Cables is strictly as per National Specifications.

ELECTROLITE cables are designed and manufactured with polymer dielectrics to bear thermal and thermo - mechanical stresses safely at continuous normal and short circuit temperature conditions.

ELECTROLITE cables are available with both thermoplastic & thermosetting insulation.

- PVC Cables Thermoplastic dielectric

- XLPE Cables Thermosetting dielectric

ELECTROLITE PVC cables use special PVC compounds to take care of over load and short circuit current with both coarse & fine protection systems.

ELECTROLITE cables are long life & user friendly during continuous emergency and short circuit conditions.

Insulation for ELECTROLITE Cables are strictly manufactured and applied over conductor in accordance with National specification :

National Specification IS: 5831 / IS: 7098 (Part 1) / IS: 14255 / IS: 694 : 2010

## LAYING UP

Cores are tested on line during production both for physical and electrical characteristics. Control is observed within tight tolerance limits for dimension in case of PVC / XLPE insulation. For multicore cables, cores are laid up our latest Sun & Planetary type laying up machine equipped with automatic sector correction equipment.

## INNER SHEATH

Laid up cables are provided with inner sheath with superior quality of PVC which acts as bedding for steel wire / strip armouring.

Wherever required, filler cords are provided to maintain the circularity to laid up cables.

In ELECTROLITE cable-polymers used for inner sheath are softer than insulation or outer sheath & are compatible with temperature rating of cables & do not have deleterious effect on any other component of cable.

Inner sheath is applied either with extrusion or by wrapping. ELECTROLITE Cables though the inner sheath is closely applied on the laid up cores, same can be stripped with ease without damaging insulation.

The inner sheath dimensions are maintained strictly in accordance with laid down specification.

Specification For XLPE Cables IS : 7098 (Part -1)

## ARMOURING

Mechanical protection to the cables is provided with armouring.

ELECTROLITE Single core cables are armoured with special Aluminium or Aluminium alloy wire / strip. thus avoiding magnetic jerks losses on A.C. system.

Multicore cables are provided with galvanized wire armouring, where cables are to run vertically and are subjected to stresses.

ELECTROLITE cables armour wires / strips are of low resistivity material and meet the requirements of IS : 3975.

## OUTER SHEATH

All ELECTROLITE Cables are manufactured with various characteristics of sheathing compound.

General purpose sheathing compound ST1

Heat resistant Compound for Sheath (H.R.) ST2

Fire Retardant Low Smoke Compound IEC-754 (Part-1)

(FRLS/Low Halogen Compound) IEC-60332 (Part-I & III)

IEEE-383

ASTM-2843

ASTM-2863

PVC compounds used for ELECTROLITE Cables are of various grades to meet specification IS:5831

Consider to be identified, ELECTROLITE Cables have their name / brand embossed / printed / indented on outer sheath at regular intervals.

On the outer sheath of ELECTROLITE cables. Voltage Grade, trade name & year of manufacture are embossed, as desired.

Cables are sequentially marked for length at every meter throughout its length.

## FINAL TESTING

Each ELECTROLITE cables tested for all applicable routine Tests.

From a lot of Cable, One Cable of each type is tested for type tests, as per relevant specification,

We conduct testing at our Works for acceptance test as per specification.

## ADVANTAGES

### ADVANTAGE OF ELECTROLITE PVC CABLES

1. A non-hygroscopic insulation almost unaffected by moisture.
2. Non-migration of compound permitting vertical installation.
3. Complete protection against most forms of electrolytic and chemical corrosion.
4. A tough and resilient sheath with excellent fire-resisting qualities & properties.
5. Good ageing Characteristics.
6. Not affected by vibration.

### ADVANTAGE OF ELECTROLITE XLPE CABLES

1. Higher Current Rating Capacity.
2. Higher Short circuit Rating.
3. Longer Service Life.
4. For a short time it can withstand maximum 130°C and is favorable to endure short circuit stresses.
5. It is less sensitive to the setting of the net work protection.
6. Because of the thermosetting process taking place due to the effect of cross linking, the crack resistance is increased.
7. Due to the chemical cross-linking, internal stresses are reduced. Consequently the material is less sensitive during manufacturing process to the setting of the cooling gradient.
8. The thermal resistivity of cross-linked material is favorably low, compared to thermoplastic material.
9. The low dielectric loss is a significant advantage.
10. The excellent mechanical features of the insulation improves the protection against external effects.
11. The resistance of the XLPE to acids, alkalis is outstanding and is often compensating the adverse environmental influences.

## CABLE CODE

The following code is used for designating the type of cable :

Aluminium Conductor .....	A
PVC insulation .....	Y
XLPE Insulation .....	2X
Steel round wire armour .....	W
Steel strip armour .....	F
Non-magnetic round wire armour.....	Wa
Non-magnetic strip armour .....	Fa
Steel double round wire armour .....	WW
Steel double strip armour .....	FF
PVC outer sheath .....	Y

## CURRENT RATING FACTORS

### RATING FACTORS FOR DEPTH OF LAYING FOR CABLES LAID DIRECT IN THE GROUND

Depth of Laying (mm)	900	1050	1200	1500	1800	2000	2500	3000 or more
1.1 KV Cable	1.00	0.99	0.97	0.95	0.94	0.93	0.91	0.90

### RATING FACTORS FOR VARIATION IN GROUND TEMPERATURE FOR CABLES - LAID DIRECT IN THE GROUND

Ground Temperature °C	15	20	25	30	35	40	45	50
Rating Factor	1.12	1.08	1.04	1.00	0.96	0.91	0.87	0.82

### RATING FACTORS FOR DEPTH OF LAYING SINGLE OR THREE CORE CABLES IN SINGLE WAY DUCTS

Depth of Laying (mm)	900	1050	1200	1500	1800	2000	2500	3000 or more
1.1 KV Cables	1.00	0.99	0.98	0.96	0.95	0.94	0.93	0.92

### RATING FACTORS FOR VARIATION IN GROUND TEMPERATURE FOR CABLES IN THE GROUND

Ground Temperature °C	15	20	25	30	35	40	45	50
Rating factor (Maximum Conductor Temp. 90°C)	1.12	1.08	1.04	1.00	0.96	0.91	0.87	0.82

### RATING FACTORS FOR VARIATION IN AMBIENT AIR TEMPERATURE

Ambient Air Temperature °C	25	30	35	40	45	50	55	60
Rating factor (Maximum Conductor Temp. 90°C)	1.16	1.11	1.06	1.00	0.94	0.88	0.81	0.74

### RATING FACTORS FOR VARIATION IN THERMAL RESISTIVITY OF SOIL FOR THREE CORE CABLE LAID DIRECT IN THE GROUND

Nominal area of conductor sq.mm.	Value of Thermal Resistivity of soil °C. cm/W					
	100	120	150	200	250	300
25	1.16	1.08	1.00	0.90	0.82	0.75
35	1.16	1.08	1.00	0.90	0.81	0.75
50	1.16	1.08	1.00	0.89	0.81	0.75
70	1.16	1.09	1.00	0.89	0.81	0.75
95	1.16	1.09	1.00	0.89	0.81	0.75
120	1.16	1.09	1.00	0.89	0.81	0.75
150	1.16	1.09	1.00	0.89	0.81	0.75
185	1.16	1.09	1.00	0.89	0.81	0.75
240	1.17	1.09	1.00	0.89	0.81	0.75
300	1.17	1.09	1.00	0.89	0.81	0.75
400	1.17	1.09	1.00	0.89	0.81	0.75
500	1.17	1.09	1.00	0.89	0.81	0.74

### RATING FACTORS FOR VARIATION IN THERMAL RESISTIVITY OF SOIL FOR THREE CORE CABLES LAID SINGLE WAY DUCTS

Nominal area of conductor sq.mm.	Value of Thermal Resistivity of soil °C. cm/W					
	100	120	150	200	250	300
25	1.07	1.04	1.00	0.93	0.89	0.84
35	1.07	1.04	1.00	0.93	0.88	0.83
50	1.07	1.04	1.00	0.93	0.88	0.83
70	1.08	1.04	1.00	0.93	0.88	0.83
95	1.08	1.05	1.00	0.93	0.87	0.83
120	1.09	1.05	1.00	0.93	0.87	0.83
150	1.09	1.05	1.00	0.93	0.87	0.83
185	1.09	1.05	1.00	0.93	0.87	0.82
240	1.09	1.05	1.00	0.93	0.87	0.82
300	1.09	1.05	1.00	0.92	0.87	0.82
400	1.10	1.06	1.00	0.92	0.87	0.82
500	1.10	1.06	1.00	0.92	0.86	0.82



## CURRENT RATING FACTORS

**RATING FACTORS FOR VARIATION IN THERMAL RESISTIVITY OF SOIL FOR THREE SINGLE CORE CABLES LAID DIRECT IN THE GROUND**

Nominal area of conductor sq.mm.	Value of Thermal Resistivity of soil °C. cm/W					
	100	120	150	200	250	300
25	1.17	1.09	1.00	0.88	0.80	0.74
35	1.18	1.10	1.00	0.88	0.80	0.74
50	1.19	1.10	1.00	0.88	0.80	0.73
70	1.19	1.10	1.00	0.88	0.80	0.73
95	1.19	1.10	1.00	0.88	0.79	0.73
120	1.19	1.10	1.00	0.88	0.79	0.73
150	1.19	1.10	1.00	0.88	0.79	0.73
185	1.19	1.10	1.00	0.88	0.79	0.72
240	1.20	1.11	1.00	0.88	0.79	0.72
300	1.20	1.11	1.00	0.87	0.79	0.72
400	1.20	1.11	1.00	0.87	0.79	0.72
500	1.20	1.11	1.00	0.87	0.79	0.72
630	1.21	1.11	1.00	0.87	0.78	0.72
800	1.21	1.11	1.00	0.87	0.78	0.72
1000	1.21	1.11	1.00	0.87	0.78	0.72

**RATING FACTORS FOR VARIATION IN THERMAL RESISTIVITY OF SOIL FOR THREE SINGLE-CORE CABLES IN DUCTS**

Nominal area of conductor sq.mm.	Value of Thermal Resistivity of soil °C. cm/W					
	100	120	150	200	250	300
25	1.11	1.05	1.00	0.92	0.85	0.80
35	1.11	1.06	1.00	0.92	0.85	0.80
50	1.12	1.06	1.00	0.92	0.85	0.79
70	1.12	1.06	1.00	0.92	0.85	0.79
95	1.12	1.07	1.00	0.91	0.84	0.79
120	1.12	1.07	1.00	0.91	0.84	0.79
150	1.12	1.07	1.00	0.91	0.84	0.78
185	1.13	1.07	1.00	0.91	0.84	0.78
240	1.13	1.07	1.00	0.90	0.83	0.78
300	1.13	1.07	1.00	0.90	0.83	0.77
400	1.14	1.08	1.00	0.90	0.83	0.77
500	1.14	1.08	1.00	0.90	0.83	0.77
630	1.14	1.08	1.00	0.90	0.82	0.76
800	1.15	1.08	1.00	0.90	0.82	0.76
1000	1.15	1.08	1.00	0.90	0.82	0.76

**CALCULATED VOLTAGE DROP IN ALUMINIUM CABLES FOR A.C. SYSTEM**

Nominal area of conductor sq.mm.	Volts / Km / Amps			
	PVC Cables		XLPE Cables	
	1-PHASE	3-PHASE	1-PHASE	3-PHASE
1.5	43.44	37.62	46.34	40.13
2.5	29.04	25.15	30.98	26.83
4	17.79	15.40	18.97	16.43
6	11.07	9.58	11.80	10.22
10	7.40	6.40	7.88	6.83
16	4.59	3.97	4.89	4.24
25	2.88	2.50	3.08	2.66
35	2.10	1.81	2.23	1.93
50	1.55	1.33	1.65	1.43
70	1.10	0.93	1.14	0.99
95	0.79	0.68	0.83	0.72
120	0.63	0.55	0.66	0.576
150	0.52	0.46	0.55	0.48
185	0.42	0.37	0.44	0.39
240	0.34	0.30	0.35	0.31
300	0.29	0.26	0.30	0.26
400	0.24	0.22	0.25	0.22
500	0.23	0.20	0.23	0.20
630	0.21	0.18	0.21	0.18
800	0.19	-	0.20	-
1000	0.18	-	0.18	-

## CURRENT RATING FACTORS

**GROUP RATING FACTORS FOR CIRCUITS OF THREE SINGLE CORE CABLES, IN TREFOIL LAID DIRECT IN THE GROUND**

Number of cables in group	Specing between trefoil group centers (mm)				
	Touching	200	400	600	800
2	0.76	0.83	0.87	0.90	0.92
3	0.64	0.72	0.79	0.83	0.86
4	0.58	0.67	0.75	0.80	0.84
5	0.53	0.63	0.71	0.77	0.81
6	0.50	0.60	0.69	0.76	0.80
7	0.47	0.58	0.67	0.74	0.79
8	0.45	0.56	0.66	0.73	-
9	0.43	0.55	0.65	0.73	-
10	0.43	0.54	0.64	-	-
11	0.41	0.53	0.64	-	-
12	0.40	0.52	0.63	-	-

**GROUP RATING FACTORS FOR CIRCUITS OF THREE SINGLE CORE CABLES, IN SINGLE-WAY DUCTS IN TREFOIL**

Number of cables in group	Specing between trefoil group centers (mm)				
	Touching	200	400	600	800
2	0.81	0.85	0.89	0.91	0.93
3	0.69	0.75	0.81	0.84	0.87
4	0.64	0.66	0.77	0.82	0.85
5	0.59	0.65	0.74	0.79	0.86
6	0.56	0.63	0.72	0.78	0.82
7	0.53	0.60	0.70	0.77	0.81
8	0.51	0.59	0.69	0.76	-
9	0.49	0.57	0.68	0.75	-
10	0.48	0.56	0.67	-	-
11	0.47	0.55	0.66	-	-
12	0.46	0.54	0.66	-	-

**GROUP RATING FACTORS FOR THREE CORE CABLES, IN HORIZONTAL FORMATION LAID DIRECT IN THE GROUND**

Number of cables in group	Specing between trefoil group centers (mm)				
	Touching	200	400	600	800
2	0.79	0.86	0.90	0.92	0.94
3	0.67	0.77	0.82	0.86	0.89
4	0.61	0.72	0.79	0.83	0.87
5	0.56	0.68	0.76	0.81	0.85
6	0.53	0.65	0.74	0.80	0.84
7	0.50	0.63	0.72	0.78	0.83
8	0.48	0.61	0.71	0.78	-
9	0.46	0.60	0.70	0.77	-
10	0.44	0.59	0.69	-	-
11	0.43	0.58	0.69	-	-
12	0.42	0.57	0.68	-	-

**GROUP RATING FACTORS FOR THREE CORE CABLES, IN HORIZONTAL FORMATION SINGLE-WAY DUCTS**

Number of cables in group	Specing between trefoil group centers (mm)				
	Touching	200	400	600	800
2	0.85	0.89	0.92	0.94	0.95
3	0.75	0.81	0.86	0.89	0.91
4	0.70	0.76	0.83	0.87	0.89
5	0.65	0.73	0.80	0.85	0.88
6	0.62	0.70	0.78	0.84	0.87
7	0.59	0.68	0.77	0.82	0.86
8	0.57	0.67	0.76	0.82	-
9	0.55	0.65	0.75	0.81	-
10	0.54	0.64	0.74	-	-
11	0.52	0.63	0.74	-	-
12	0.51	0.62	0.73	-	-

**TABLE-71**  
**SHORT CIRCUIT RATING OF 1100 VOLTS GRADE PVC**  
**INSULATED HEAVY DUTY CABLES**  
**(FOR DURATION OF ONE SECOND)**

Nominal Area of Conductor	Aluminium Conductor		Copper Conductor	
	With General Purpose Insulation	With Heat resisting Insulation	With General Purpose Insulation	With Heat resisting Insulation
sq.mm.	K.Amp	K.Amp	K.Amp	K.Amp
1.5	0.114	0.103	0.173	0.156
2.5	0.190	0.172	0.288	0.260
4.0	0.304	0.275	0.460	0.416
6.0	0.456	0.412	0.690	0.624
10	0.760	0.687	1.150	1.040
16	1.216	1.100	1.840	1.660
25	1.900	1.720	2.880	2.600
35	2.660	2.400	4.030	3.640
50	3.800	3.430	5.750	5.200
70	5.320	4.800	8.050	7.280
95	7.220	6.520	10.900	9.880
120	9.120	8.244	13.800	12.500
150	11.400	10.100	17.300	15.600
185	14.060	12.700	21.300	19.200
240	18.240	16.500	27.300	25.000
300	22.800	20.600	34.500	31.200
400	30.400	27.400	46.000	41.600
500	38.000	34.300	57.500	52.000
630	47.880	43.200	72.500	65.500
800	60.800	54.900	92.000	83.200
1000	76.000	68.600	115.000	104.000

**TABLE-72**  
**SHORT CIRCUIT RATING FOR**  
**XLPE INSULATED CABLES**  
**(FOR DURATION OF ONE SECOND)**

Nominal Area Conductor	With Aluminium Conductor	With Copper Conductor
sq.mm.	K.Amp	K.Amp
1.5	0.141	0.215
2.5	0.235	0.358
4.0	0.376	0.572
6.0	0.564	0.858
10	0.940	1.430
16	1.504	2.290
25	2.350	3.580
35	3.290	5.000
50	4.700	7.150
70	6.580	10.000
95	8.930	13.590
120	11.280	17.160
150	14.100	21.450
185	17.390	26.450
240	22.560	34.320
300	28.200	42.900
400	37.600	57.200
500	47.000	71.500
630	59.220	90.100
800	75.200	114.400
1000	94.000	143.000

**FORMULAS FOR ELECTRICAL PARAMETER CALCULATIONS**

Characteristics	Symbol	Unit	Equation	Where
Capacitance	C	μF / km	$C = \frac{\epsilon}{18 \log_e \frac{D}{d}}$	C - Capacitance, ε - Permittivity of material, D - Dia over insulation, d - Conductor diameter
Inductance	L	mH / km	$L = K + 0.20 \log_e \frac{2S}{d}$	K - Constant, depends on cond. construction, S - conductors axil spacing, d - conductor diameter
Reactance	X	ohms / km	$X = 2 \times \pi \times f \times L \times 10^{-3}$	f - frequency, L - Inductance
Impedance	Z	ohms / km	$Z = \sqrt{R^2 + X^2}$	R - A.C. Resistance, X - Reactance
Charging Current	Ic	amp / km	$Ic = 2 \times \pi \times f \times C \times V \times 10^{-6}$	Ic - charging current, f - frequency, C - capacitance, V - voltage applied
Di-electric Losses	D	w / km / phase	$D = 2\pi f \times C \times u_0^2 \times \tan \delta \times 10^{-6}$	D - di-electric loss, f - frequency, C - capacitance - neutral, u0 - phase voltage - neutral, tan δ - di-elect. power factor

**TABLE-73**  
**CHARACTERISTICS OF CONDUCTOR MATERIAL**

Particulars Copper	Annealed Copper	Hard Drawn Aluminium	Hard Drawn (Galvanised)	Steel
<b>Conductivity percent</b>	<b>100 (average)</b>	<b>97 (minimum)</b>	<b>61 (minimum)</b>	
Volume resistivity at 20°C in ohm-mm <sup>2</sup> /m	0.017241 (standard)	0.01771 (average)	0.028264 (maximum)	-
Mass resistivity at 20°C in ohm gms/m	0.15328	0.15741	0.076398	-
Resistance at 20°C in ohm mm <sup>2</sup> /km	17.241	17.71	28.264	-
Density at 20°C in gms/cm <sup>2</sup>	8.89	8.89	2.703	7.78
Weight in Kg / mm <sup>2</sup> / km	8.89	8.89	2.703	7.78
Temperature coefficient of resistance at 20°C per °c	.00393	.00381	00403	-
Coefficient of liner expansion at 20°C per °C	17 x 10 <sup>-6</sup>	17 x 10 <sup>-6</sup>	23 x 10 <sup>-16</sup>	11.5 x 10 <sup>-6</sup>
Ultimate tensile stress (approx.) in kg/mm <sup>2</sup>	25.3	42.2	16.5	36
Modulus of elasticity in kg/mm <sup>2</sup>	9 to 10.5 x 10 <sup>3</sup>	12.66 x 10 <sup>3</sup>	6.96 x 10 <sup>3</sup>	19.7 x 10 <sup>3</sup>

**TABLE-74**  
**CHARACTERISTICS OF DIELECTRIC MATERIALS**

Particulars	Material		
	Cross linked polyethylene	Polyethylene	PVC
Specific Gravity	0.92	0.92	1.3 - 1.6
Dielectric Strength (KV/mm)	35-50	35-50	15-25
Volume Resistivity (ohm-Cm)	10 <sup>15</sup>	10 <sup>15</sup>	10 <sup>13</sup> to 10 <sup>14</sup>
Dielectric Constant	2.3	2.3	5-8
Power Factor	0.003	0.003	0.08
Tensile Strength (N/mm <sup>2</sup> )	13 to 16	13 to 16	14 to 20
Elongation (%)	250 to 400	250 to 500	200 to 300
Maximum Operating Temperature (°C)	90	70	70
Maximum Conductor Temperature for Short Circuit (°C)	250	130	160
Minimum Working Temperature (°C)	-40	-40	-20 (GP PVC) -15 (HR PVC)

**TABLE - 75**  
**CHARACTERISTICS OF FRLS PVC COMPOUND**

Particulars	Characteristics
Oxygen Index as per ASTM-D-2863 (%)	Min-29
Temp. Index as per ASTM D 2863 (°C)	Min-250
Smoke Density Rating as per ASTM D 2843 (%)	Max-60
Acid Gas Generation as per IEC 754 (1) (% by weight)	Max-20
Swedish Chimney Test as per SS-424-14-75 (1) (Class F3)	Unaffected length from top 300 mm (min.)
Vertical Tray Flame Propagation Test as per IEEE-383	Flame shall not propagate & burn the total height of eight feet tray.
Single vertical cable fire resistance test as per IEC-332 (1)	Min. 500mm cable unaffected from bottom edge of the top clamp.
Bunched Vertical Cables fire resistance test as per IEC-332 (111)	Max. affected length of the cables 2.5 metre from bottom edge of burner



**L. T. XLPE CABLES**  
**AS PER**  
**IS : 7098 (PART-I) - 1988**

**7098**



**Part-I**

## COMPARISON BETWEEN XLPE & PVC CABLES

S.No.	Properties	Unit	XLPE	PVC
1	Chemical structure	-	Thermoset, cross linked	Thermoplastic, linear bonded
2	Polymer structure	-	Partial crystalline	Amorphous
3	Temperature rating			
	a) - Operating	°C	90	70-70
	b) Emergency overload	°C	130	120
	c) - Short circuit	°C	250	160
4	Specific gravity	-	0.90-0.92	1.35-1.55
5	Cable installation work	-	Easy due to less weight, less dia.	-
6	Current carrying capacity	-	Approx. 30% higher than PVC	-
7	Tensile strength	N/MM <sup>2</sup>	13-16	15-20
8	Elongation	%	250-450	200-325
9	Ageing resistance			
	a) at 100°C	-	Excellent	Moderate
	b) at 120°C	-	Good	Poor
	c) at 150°C	-	Moderate	Very Poor
10	Dielectric breakdown	Kv/mm	35-55	15-25
11	Volume resistivity	Ohm-cm	More than 10 <sup>15</sup>	1 x 10 <sup>13</sup> - 5 x 10 <sup>14</sup>
12	Thermal resistivity	°C cm/W	350	650
13	Dielectric constant at 20°C	-	2.3	7.4
14	Power factor	-	0.0003	0.08
15	Minimum working temperature	°C	-40	-15
16	Deformation resistance at 150°C	-	Good	Poor
17	Fungus resistance	-	Good	Poor
18	Moisture penetration resistance	-	Excellent	Good
19	Oil resistance	-	Excellent	Fail
20	Solvent resistance	-	Excellent	Poor
21	Acid resistance	-	Excellent	Fair
22	Alkali resistance	-	Excellent	Good
23	Health	-	Neutral	Toxic
24	Ultraviolet light resistance	-	Excellent	Good
25	Overall saving	-	More economic than PVC cable	-

**ELECTROLITE SINGLE CORE ALUMINIUM CONDUCTOR  
XLPE INSULATED ARMoured CABLES  
CONFIRMING TO IS : 7098 (PART-1)**

Type	No. of cores & cross sectional area	Min. No. of Wires	Thickness of XLPE insulation (Nom.) (mm)	Nominal Dimensions of Armour Wire (mm)	Min. Thickness of PVC Outer Sheath (mm)	Overall Diameter (Approx.) (mm)	Approx. Net Wt. of Cable (Kg/Km)	Max. D.C. Resistance at 20°C Ohms/Km	Max. A.C. Resistance 90°C Ohms/Km	Approx. Reactance at 50 Hz Ohms/Km	Approx. Capacitance mFd/Km	Current Ratings	
												Direct in Ground Amps	In Air Amps
A2xway	1CX4	1	1.00	1.40	1.2400	11.500	160	7.4100	9.4800	-	-	42	34
A2xway	1CX6	1	1.00	1.40	1.2400	12.500	180	4.6100	5.9000	-	-	52	43
A2xway	1CX10	1	1.00	1.40	1.2400	13.000	210	3.0800	3.9400	0.134	0.32	69	60
A2xway	1CX16	1	1.00	1.40	1.2400	13.500	260	1.9100	2.4400	0.125	0.38	90	82
A2xway	1CX25	7	1.20	1.40	1.2400	14.000	270	1.2000	1.5400	0.116	0.40	96	98
A2xway	1CX35	7	1.20	1.40	1.2400	15.000	320	0.8680	1.1100	0.110	0.47	114	121
A2xway	1CX50	7	1.30	1.40	1.2400	17.000	390	0.6410	0.8200	0.103	0.50	135	150
A2xFay	1CX70	19	1.40	1.40	1.2400	19.000	490	0.4430	0.5670	0.099	0.55	166	187
A2xFay	1CX95	19	1.40	1.60	1.4000	21.000	650	0.3200	0.4100	0.097	0.64	198	230
A2xFay	1CX120	19	1.50	1.60	1.4000	23.000	760	0.2530	0.3250	0.096	0.67	225	268
A2xFay	1CX150	19	1.70	1.60	1.4000	25.000	880	0.2060	0.2650	0.091	0.67	253	309
A2xFay	1CX185	37	1.90	1.60	1.4000	27.000	1050	0.1640	0.2110	0.090	0.67	286	360
A2xFay	1CX240	37	2.00	1.60	1.4000	29.000	1280	0.1250	0.1620	0.086	0.72	332	433
A2xFay	1CX300	37	2.10	1.60	1.5600	32.000	1530	0.1000	0.1300	0.085	0.75	376	501
A2xFay	1CX400	61	2.40	2.00	1.5600	37.000	2000	0.0778	0.1023	0.085	0.75	431	596
A2xFay	1CX500	61	2.60	2.00	1.5600	40.000	2410	0.0605	0.0808	0.083	0.77	490	693
A2xFay	1CX630	61	2.80	2.00	1.7200	45.000	2900	0.0469	0.0648	0.082	0.81	557	814
A2xFay	1CX800	61	3.10	2.00	1.8800	50.000	3730	0.0367	0.0530	0.081	0.88	600	890
A2xFay	1CX1000	61	3.30	2.50	2.0400	56.000	4730	0.0291	0.0444	0.081	0.88	650	1050

**ELECTROLITE SINGLE CORE ALUMINIUM CONDUCTOR  
XLPE INSULATED UNARMoured CABLES  
CONFIRMING TO IS : 7098 (PART-1)**

Type	No. of cores & cross sectional area	Min. No. of Wires	Thickness of XLPE insulation (Nom.) (mm)	Min. Thickness of PVC Outer Sheath (mm)	Overall Diameter (Approx.) (mm)	Approx. Net Wt. of Cable (Kg/Km)	Max. D.C. Resistance at 20°C Ohms/Km	Max. A.C. Resistance 70°C Ohms/Km	Approx. Reactance at 50 Hz Ohms/Km	Approx. Capacitance mFd/Km	Current Ratings	
											Direct in Ground Amps	In Air Amps
A2xy	1CX4	1	0.7	1.80	9	70	7.4100	9.4900	0.132	0.29	42	34
A2xy	1CX6	1	0.7	1.80	10	88	4.6100	5.9000	0.123	0.34	52	43
A2xy	1CX10	1	0.7	1.80	11	100	3.0600	3.9400	0.114	0.43	69	60
A2xy	1CX16	7	0.7	1.80	12	150	1.9100	2.4500	0.108	0.51	90	82
A2xy	1CX25	7	0.90	1.80	12	190	1.2000	1.5400	0.102	0.52	96	98
A2xy	1CX35	7	0.90	1.80	13	230	0.8680	1.1100	0.097	0.60	114	121
A2xy	1CX50	7	1.00	1.80	15	208	0.6410	0.8200	0.092	0.63	135	150
A2xy	1CX70	19	1.10	1.80	16	370	0.4430	0.5670	0.088	0.68	166	187
A2xy	1CX95	19	1.10	1.80	18	460	0.3200	0.4100	0.085	0.79	198	230
A2xy	1CX120	19	1.20	1.80	20	560	0.2530	0.3250	0.082	0.79	225	268
A2xy	1CX150	19	1.40	2.00	22	690	0.2060	0.2650	0.082	0.79	253	309
A2xy	1CX185	37	1.60	2.00	24	840	0.1640	0.2110	0.082	0.79	286	360
A2xy	1CX240	37	1.70	2.00	27	1030	0.1250	0.1620	0.079	0.84	332	433
A2xy	1CX300	37	1.80	2.00	29	1240	0.1000	0.1300	0.078	0.86	376	501
A2xy	1CX400	61	2.00	2.20	33	1590	0.0778	0.1023	0.077	0.88	431	596
A2xy	1CX500	61	2.20	2.20	36	1960	0.0605	0.0808	0.076	0.90	490	693
A2xy	1CX630	61	2.40	2.20	41	2460	0.0469	0.0648	0.075	0.94	557	814
A2xy	1CX800	61	2.60	2.40	46	3100	0.0367	0.0530	0.075	0.97	600	890
A2xy	1CX1000	61	2.80	2.60	51	3850	0.0291	0.0444	0.068	1.01	650	1050



**ELECTROLITE SINGLE CORE COPPER CONDUCTOR  
XLPE INSULATED ARMoured CABLES  
CONFIRMING TO IS : 7098 (PART-1)**

Type	No. of cores & cross sectional area sqmm	Min. No. of Wires	Thickness of XLPE insulation (Nom.) (mm)	Nominal Dimensions of Armour Wire (mm)	Min. Thickness of PVC Outer Sheath (mm)	Overall Diameter (Approx.) (mm)	Approx. Net Wt. of Cable (Kg/Km)	Max. D.C. Resistance at 20°C Ohms/Km	Max. A.C. Resistance 90°C Ohms/Km	Approx. Reactance at 50 Hz Ohms/Km	Approx. Capacitance mFd/Km	Current Ratings	
												Direct in Ground Amps	In Air Amps
2XWaY	1CX4	1	1.00	1.40	1.24	11.50	185	4.61	5.90	-	-	-	-
2XWaY	1CX6	1	1.00	1.40	1.24	12.50	210	3.08	3.94	-	-	-	-
2XWaY	1CX10	7	1.00	1.40	1.24	13.00	270	1.83	2.34	0.134	0.32	-	-
2XWaY	1CX16	7	1.00	1.40	1.24	13.50	320	1.15	1.47	0.125	0.38	-	-
2XWaY	1CX25	7	1.20	1.40	1.24	14	395	0.727	0.930	0.116	0.40	132	132
2XWaY	1CX35	7	1.20	1.40	1.24	15	500	0.524	0.671	0.110	0.47	156	156
2XWaY	1CX50	7	1.30	1.40	1.24	17	634	0.387	0.495	0.103	0.50	186	198
2XFaY	1CX70	19	1.40	1.40	1.24	19	846	0.268	0.343	0.099	0.55	228	246
2XFaY	1CX95	19	1.40	160	1.40	21	1139	0.193	0.247	0.097	0.64	264	294
2XFaY	1CX120	19	1.50	1.60	1.40	23	1390	0.153	0.196	0.093	0.67	300	336
2XFaY	1CX150	19	1.70	1.60	1.40	25	1667	0.124	0.129	0.0914	0.67	336	384
2XFaY	1CX185	37	1.90	1.60	1.40	27	2039	0.0991	0.127	0.090	0.67	366	444
2XFaY	1CX240	37	2.00	1.60	1.40	29	2584	0.0754	0.0965	0.086	0.72	414	510
2XFaY	1CX300	37	2.10	1.60	1.56	32	3184	0.0601	0.0769	0.085	0.75	450	570
2XFaY	1CX400	61	2.40	2.00	1.56	37	4099	0.0470	0.0602	0.085	0.75	480	660
2XFaY	1CX500	61	2.60	2.00	1.56	40	5118	0.0366	0.0468	0.083	0.77	570	708
2XFaY	1CX630	61	2.80	2.00	1.72	45	6511	0.0283	0.0362	0.082	0.81	564	825
2XFaY	1CX800	61	3.10	2.00	1.88	50	8250	0.0221	0.0283	0.081	0.88	660	945
2XFaY	1CX1000	61	3.30	2.50	2.04	56	10386	0.0176	0.0225	0.081	0.88	723	1063

**ELECTROLITE SINGLE CORE COPPER CONDUCTOR  
XLPE INSULATED UNARMoured CABLES  
CONFIRMING TO IS : 7098 (PART-1)**

Type	No. of cores & cross sectional area mm <sup>2</sup>	Min. No. of Wires	Thickness of XLPE insulation (Nom.) (mm)	Nominal Thickness of PVC Outer Sheath (mm)	Overall Diameter (Approx.) (mm)	Approx. Net Wt. of Cable (Kg/Km)	Max. D.C. Resistance at 20°C Ohms/Km	Max. A.C. Resistance 90°C Ohms/Km	Approx. Reactance at 50 Hz Ohms/Km	Approx. Capacitance Direct in mFd/Km	Current Ratings	
											Direct in Ground Amps	In Air Ground Amps
2XY	1C X 4	1	0.70	1.80	9.0	95	4.61	5.900	0.132	0.29	-	-
2XY	1C X 6	1	0.70	1.80	10.0	125	3.08	3.9400	0.123	0.34	-	-
2XY	1C X 10	7	0.70	1.80	11.0	160	1.83	2.3400	0.114	0.43	-	-
2XY	1C X 16	7	0.70	1.80	11.50	260	1.15	1.4700	0.108	0.51	-	-
2XY	1C X 25	7	0.90	1.8	12	315	0.727	0.930	0.102	0.52	132	132
2XY	1C X 35	7	0.90	1.8	13	409	0.524	0.671	0.097	0.60	156	156
2XY	1C X 50	7	1.00	108	15	532	0.387	0.495	0.092	0.63	186	198
2XY	1C X 70	19	1.140	1.80	16	731	0.268	0.343	0.088	0.68	228	246
2XY	1C X 95	19	1.10	1.80	18	973	0.193	0.247	0.085	0.79	264	294
2XY	1C X 120	19	1.20	1.80	20	1207	0.153	0.196	0.082	0.79	300	336
2XY	1C X 150	19	1.40	2.00	22	1491	0.124	0.159	0.082	0.79	336	384
2XY	1C X 185	37	1.60	2.00	24	1838	0.0991	0.127	0.082	0.79	366	444
2XY	1C X 240	37	1.70	2.00	27	2356	0.0754	0.0965	0.079	0.84	414	510
2XY	1C X 300	37	1.80	2.00	29	2916	0.0601	0.0769	0.078	0.86	450	570
2XY	1C X 400	61	2.00	2.2	33	3720	0.0470	0.0602	0.077	0.88	480	660
2XY	1C X 500	61	2.20	2.2	36	4708	0.0366	0.0468	0.076	0.90	570	708
2XY	1C X 630	61	2.40	2.2	41	6022	0.0283	0.0362	0.075	0.94	564	825
2XY	1C X 800	61	2.60	2.4	46	7676	0.0221	0.083	0.075	0.97	660	945
2XY	1C X 1000	61	2.80	2.6	51	9587	0.0176	0.0225	0.068	1.01	723	1063

## ELECTROLYTE 2 CORE ALUMINIUM CONDUCTOR XLPE INSULATED ARMoured CABLES CONFIRMING TO IS : 7098 (PART-1)

Type	No. of cores & cross sectional area mm <sup>2</sup>	Min. No. of Wires	Thickness of XLPE insulation (Nom.) (mm)	Min. Thickness of PVC inner Sheath (mm)	Nominal Dimensions of Armour Wire Strip (mm)	Min. Thickness of Outer Sheath Wire Strip Armour (mm)	Overall Diameter (Approx.) Wire Strip Armour	Approx. Net Wt. of Cable Wire Strip Armour	Max. D.C. Resistance at 20°C Ohms/Km	Max. A.C. Resistance at 90°C Ohms/Km	Approx. Reactance at 50 Hz Ohms/Km	Approx. Capacitance Ohms/Km	Current Ratings	
													Direct in Ground Amps	In Air Amps
A2xwy	2CX4	1	0.70	0.3	1.40	124	16	440	7.41	9.48	-	-	54	31
A2xwy	2CX6	1	0.70	0.3	1.40	124	17	550	4.61	5.90	-	-	43	40
A2xf/A2xwy	2CX10	1	0.70	0.3	1.40	124	18	650	3.08	3.94	-	-	57	53
A2xf/A2xwy	2CX16	7	0.70	0.3	1.40	124	18	580	1.91	2.44	-	-	73	70
A2xf/A2xwy	2CX25	7	0.90	0.3	1.60	140	21	840	1.2000	1.5400	0.080	0.20	112	98
A2xf/A2xwy	2CX35	7	0.90	0.3	1.60	140	22	970	0.8680	1.1100	0.080	0.23	138	124
A2xf/A2xwy	2CX50	7	1.00	0.3	1.60	140	24	1150	0.6410	0.8200	0.078	0.24	169	156
A2xf/A2xwy	2CX70	19	1.10	0.3	1.60	156	27	1430	0.4430	0.5670	0.077	0.26	200	188
A2xf/A2xwy	2CX95	19	1.10	0.4	2.00	156	31	1900	0.3200	0.4100	0.074	0.29	238	231
A2xf/A2xwy	2CX120	19	1.20	0.4	2.00	156	33	2220	0.2530	0.3250	0.072	0.29	262	262
A2xf/A2xwy	2CX150	19	1.40	0.4	2.00	172	36	2550	0.2060	0.2650	0.072	0.29	300	300
A2xf/A2xwy	2CX185	37	1.60	0.5	2.00	188	39	3030	0.1640	0.2110	0.072	0.29	344	344
A2xf/A2xwy	2CX240	37	1.70	0.5	2.50	204	45	3930	0.1250	0.1620	0.072	0.31	400	406
A2xf/A2xwy	2CX300	37	1.80	0.6	2.50	204	48	4650	0.1000	0.1300	0.071	0.33	444	456
A2xf/A2xwy	2CX400	61	2.00	0.6	2.50	236	54	5600	0.0778	0.1023	0.070	0.33	481	525

## 2 CORE ALUMINIUM XLPE UNARMoured POWER CABLES

Type	No. of cores & cross sectional area	Min. No. of Wires	Thickness of insulation (Nom.) (mm)	Min. Thickness of inner sheath (mm)	Nominal Thickness of Outer Sheath (mm)	Overall Diameter (Approx.) (mm)	Net Wt. of Cable (Approx.) Ohms/Km	Max. D.C. Resistance at 20°C Ohms/Km	Max. A.C. Resistance at 90°C Ohms/Km	Approx. Reactance at 50 Hz Ohms/Km	Approx. Capacitance mFd/Km	Current Ratings	
												Direct in Ground Amps	In Air Amps
A2xy	2CX4	1	0.7	0.3	1.80	13.50	210	7.41	9.48	-	-	34	31
A2xy	2CX6	1	0.7	0.3	1.80	15	280	4.61	5.90	-	-	43	40
A2xy	2CX10	1	0.7	0.3	1.80	16	300	3.08	3.94	-	-	57	53
A2xy	2CX16	7	0.7	0.3	1.80	17	380	1.91	2.44	-	-	73	70
A2xy	2CX25	7	0.90	0.3	2.00	18	420.00	1.20	1.54	0.080	0.20	112	98
A2xy	2CX35	7	0.90	0.3	2.00	20	510.00	0.87	1.11	0.080	0.23	138	124
A2xy	2CX50	7	1.00	0.3	2.00	22	630.00	0.64	0.82	0.078	0.24	169	156
A2xy	2CX70	19	1.10	0.4	2.20	25	800.00	0.44	0.57	0.077	0.26	200	188
A2xy	2CX95	19	1.10	0.4	2.20	28	1040.00	0.32	0.41	0.074	0.29	238	231
A2xy	2CX120	19	1.20	0.4	2.20	30	1260.00	0.25	0.33	0.072	0.29	262	262
A2xy	2CX150	19	1.40	0.4	2.20	33	1480.00	0.21	0.27	0.072	0.29	300	300
A2xy	2CX185	37	1.60	0.5	2.40	36	1840.00	0.16	0.21	0.072	0.29	344	344
A2xy	2CX240	37	1.70	0.5	2.60	40	2250.00	0.13	0.16	0.072	0.31	400	406
A2xy	2CX300	37	1.80	0.6	2.80	44	2810.00	0.10	0.13	0.071	0.33	444	456
A2xy	2CX400	61	2.00	0.6	3.00	49	3530.00	0.08	0.10	0.070	0.33	481	525

## ELECTROLITE 2 CORE COPPER CONDUCTOR XLPE INSULATED ARMoured CABLES CONFIRMING TO IS : 7098 (PART-1)

Type	No. of cores & cross sectional area mm <sup>2</sup>	Min. No. of Wires	Thickness of XLPE insulation (Nom.) (mm)	Min. Thickness of PVC inner Sheath (mm)	Nominal Dimensions of Armour Strip Wire (mm)	Min. Thickness of Outer Sheath Wire Strip Armour (mm)	Overall Diameter (Approx.) Wire Strip Armour (mm)	Approx. Net Wt. of Cable Wire Strip Kg/Km	Max. D.C. Resistance at 20°C Ohms/Km	Max. A.C. Resistance at 90°C Ohms/Km	Approx. Reactance at 50 Hz Ohms/Km	Approx. Capacitance Ohms/Km	Current Ratings	
													Direct in Ground Amps	In Air Amps
2XWY	2C X 4	1	0.70	0.3	1.40	1.24	16.10	490	4.61	5.90	-	-	-	-
2XWY	2C X 6	1	0.70	0.3	1.40	1.24	17.00	620	3.08	3.94	-	-	-	-
2XWY/2XFY	2C X 10	7	0.70	0.3	1.40	1.24	18.00	720	1.83	2.34	-	-	-	-
2XWY/2XFY	2C X 16	7	0.70	0.3	1.40	1.24	18.00	790	1.15	1.47	-	-	-	-
2XWY/2XFY	2C X 25	7	0.90	0.3	4X0.8	1.40	21.0	1059	0.727	0.930	0.080	0.20	144	131
2XWY/2XFY	2C X 35	7	0.90	0.3	4X0.8	1.40	22.0	1299	0.524	0.671	0.080	0.23	175	150
2XWY/2XFY	2C X 50	7	1.00	0.3	4X0.8	1.40	24.0	1607	0.387	0.495	0.078	0.24	206	194
2XWY/2XFY	2C X 70	19	1.10	0.3	4X0.8	1.56	27.0	2108	0.268	0.343	0.077	0.26	256	244
2XWY/2XFY	2C X 95	19	1.10	0.4	4X0.8	1.56	31.0	2847	0.193	0.247	0.074	0.29	300	288
2XWY/2XFY	2C X 120	19	1.20	0.4	4X0.8	1.56	33.0	3459	0.153	0.196	0.072	0.29	344	331
2XWY/2XFY	2C X 150	19	1.40	0.4	4X0.8	1.72	36.0	4062	0.124	0.159	0.072	0.29	388	381
2XWY/2XFY	2C X 185	37	1.60	0.5	4X0.8	1.88	39.0	4936	0.0991	0.127	0.072	0.29	438	438
2XWY/2XFY	2C X 240	37	1.70	0.5	4X0.8	2.04	45.0	6487	0.0754	0.0965	0.072	0.31	506	512
2XWY/2XFY	2C X 300	37	1.80	0.6	4X0.8	2.20	48.0	7831	0.0601	0.0769	0.071	0.33	562	581
2XWY/2XFY	2C X 400	61	2.00	0.6	4X0.8	2.36	54.0	9688	0.0470	0.0602	0.070	0.33	612	662

## 2 CORE COPPER XLPE UNARMoured POWER CABLES

Type	No. of cores & cross sectional area mm <sup>2</sup>	Min. No. of Wires	Thickness of XLPE insulation (Nom.) (mm)	Min. Thickness of PVC inner sheath (mm)	Nominal Thickness of PVC Outer Sheath (mm)	Overall Diameter (Approx.) (mm)	Approx. Net Wt. of Cable Kg/Km	Max. D.C. Resistance at 20°C Ohms/Km	Max. A.C. Resistance at 90°C Ohms/Km	Approx. Reactance at 50 Hz mFd/Km	Approx. Capacitance	Current Ratings	
												Direct in Ground Amps	In Air Amps
2XY	2CX4	1	0.7	0.3	1.80	13.50	270	4.61	5.90	-	-	-	-
2XY	2CX6	1	0.7	0.3	1.80	15.00	350	3.08	3.94	-	-	-	-
2XY	2CX10	7	0.7	0.3	1.80	16.00	400	1.83	2.34	-	-	-	-
2XY	2CX16	7	0.7	0.3	1.80	17.00	570	1.15	1.47	-	-	-	-
2XY	2CX25	7	0.90	0.3	2.00	18.0	672	0.727	0.930	0.080	0.20	144	131
2XY	2CX35	7	0.90	0.3	2.00	20.0	865	0.524	0.671	0.080	0.23	175	150
2XY	2CX50	7	1.00	0.3	2.00	22.0	114	0.387	0.495	0.078	0.24	206	194
2XY	2CX70	19	1.10	0.3	2.00	25.0	1519	0.268	0.343	0.077	0.26	256	244
2XY	2CX95	19	1.10	0.4	2.20	28.0	2048	0.193	0.247	0.074	0.29	300	288
2XY	2CX120	19	1.20	0.4	2.20	30.0	2526	0.153	0.196	0.072	0.29	344	331
2XY	2CX150	19	1.40	0.4	2.20	33.0	3062	0.124	0.159	0.072	0.29	388	381
2XY	2CX185	37	1.60	0.5	2.40	36.0	3813	0.0991	0.127	0.072	0.29	438	438
2XY	2CX240	37	1.70	0.5	2.60	40.0	4917	0.0754	0.0965	0.072	0.31	506	512
2XY	2CX300	37	1.80	0.6	2.80	44.0	6107	0.0601	0.0769	0.071	0.33	562	581
2XY	2CX400	61	2.00	0.6	3.00	49.0	7732	0.0470	0.0602	0.070	0.33	612	662

## ELECTROLYTE 3 CORE ALUMINIUM CONDUCTOR XLPE INSULATED ARMoured CABLES CONFIRMING TO IS : 7098 (PART-1)

Type	No. of cores & cross sectional area	Min. No. of Wires	Thickness of insulation (Nom.) (mm)	Min. Thickness of inner Sheath (mm)	Nominal Dimensions of Armour Strip Wire (mm)	Min. Thickness of Outer Sheath Wire Strip Armour (mm)	Overall Diameter (Approx.) Wire Strip Armour (mm)	Approx. Net Wt. of Cable Wire Strip Kg/Km	Max. D.C. Resistance at 20°C Ohms/Km	Max. A.C. Resistance at 90°C Ohms/Km	Approx. Reactance at 500 Hz Ohms/Km	Approx. Capacitance mFd/Km	Current Ratings	
													Direct in Ground Amps	In Air Amps
A2xwy	3CX4	1	0.7	0.3	1.4	-	16.50	-	7.41	9.48	-	-	34	37
A2xwy	3CX6	1	0.7	0.3	1.4	-	17.50	-	4.61	5.90	-	-	43	40
A2xfy/A2xwy	3CX10	1	0.7	0.3	1.4	-	19.50	-	3.08	3.04	-	-	57	53
A2xfy/A2xwy	3CX16	7	0.7	0.3	1.4	4X0.8	20.00	19.00	1.91	2.44	-	-	73	70
A2xfy/A2xwy	3CX25	7	0.9	0.3	1.6	4X0.8	23	21.3	1.2	1.54	0.08	0.2	94	96
A2xfy/A2xwy	3CX35	7	0.9	0.3	1.6	4X0.8	25	23	0.868	1.11	0.08	0.23	113	117
A2xfy/A2xwy	3CX50	7	1	0.3	1.6	4X0.8	28	26	0.641	0.82	0.078	0.24	133	142
A2xfy/A2xwy	3CX70	19	1.1	0.4	2	4X0.8	32	30	0.443	0.567	0.077	0.26	164	179
A2xfy/A2xwy	3CX95	19	1.1	0.4	2	4X0.8	35	32	0.32	0.41	0.074	0.29	196	221
A2xfy/A2xwy	3CX120	19	1.2	0.4	2	4X0.8	39	36	0.253	0.325	0.072	0.29	223	257
A2xfy/A2xwy	3CX150	19	1.4	0.5	2	4X0.8	42	39	0.206	0.265	0.072	0.29	249	292
A2xfy/A2xwy	3CX185	37	1.6	0.5	2.5	4X0.8	47	44	0.164	0.211	0.072	0.29	282	337
A2xfy/A2xwy	3CX240	37	1.7	0.6	2.5	4X0.8	53	49	0.125	0.162	0.072	0.31	326	399
A2xfy/A2xwy	3CX300	37	1.8	0.6	2.5	4X0.8	58	54	0.1	0.13	0.071	0.33	367	455
A2xfy/A2xwy	3CX400	61	2	0.7	3.15	4X0.8	65	60	0.0778	0.1023	0.07	0.33	418	530

## 3 CORE ALUMINIUM XLPE UNARMoured POWER CABLES

Type	No. of cores & cross sectional area	Min. No. of Wires	Thickness of insulation (Nom.) (mm)	Min. Thickness of inner sheath (mm)	Nominal Thickness of Outer Sheath (mm)	Overall Diameter (Approx.) (mm)	Net Wt. of Cable (Approx.) Kg/Km	Max. D.C. Resistance at 20°C Ohms/Km	Max. A.C. Resistance at 90°C Ohms/Km	Approx. Reactance at 50 Hz Ohms/Km	Approx. Capacitance mFd/Km	Current Ratings	
												Direct in Ground Amps	In Air Amps
A2xy	3CX4	1	0.7	0.3	1.80	14.00	250	7.41	9.49	-	-	34	31
A2xy	3CX6	1	0.7	0.3	1.80	15.50	300	4.61	5.90	-	-	43	40
A2xy	3CX10	1	0.7	0.3	1.80	17.00	350	3.06	3.94	-	-	57	53
A2xy	3CX16	7	0.7	0.3	1.80	17.00	350	1.91	2.45	-	-	73	70
A2xy	3CX25	7	0.90	0.30	2	21	520	1.2000	0.5400	0.080	0.20	94	96
A2xy	3CX35	7	0.90	0.30	2	23	640	0.8680	1.1100	0.080	0.23	113	117
A2xy	3CX50	7	1.00	0.30	2	25	700	0.6410	0.8200	0.078	0.24	133	142
A2xy	3CX70	19	1.10	0.40	2.2	29	1080	0.4430	0.5670	0.077	0.26	164	179
A2xy	3CX95	19	1.10	0.40	2.2	32	1350	0.3200	0.4100	0.074	0.29	196	221
A2xy	3CX120	19	1.20	0.40	2.2	35	1640	0.2530	0.3250	0.072	0.29	223	257
A2xy	3CX150	19	1.40	0.50	2.4	39	2020	0.2060	0.2650	0.072	0.29	249	292
A2xy	3CX185	37	1.60	0.50	2.6	43	2490	0.1640	0.2110	0.072	0.29	282	337
A2xy	3CX240	37	1.70	0.60	2.8	48	3150	0.1250	0.1620	0.072	0.31	326	399
A2xy	3CX300	37	1.80	0.60	3	53	3890	0.1000	0.1300	0.071	0.33	367	455
A2xy	3CX400	61	2.00	0.70	3.2	59	4840	0.0778	0.1023	0.070	0.33	418	530

## ELECTROLITE 3 CORE COPPER CONDUCTOR XLPE INSULATED ARMoured CABLES CONFIRMING TO IS : 7098 (PART-1)

Type	No. of cores & cross sectional area mm <sup>2</sup>	Min. No. of Wires	Thickness of XLPE insulation (Nom.) (mm)	Min. Thickness of PVC inner Sheath (mm)	Nominal Dimensions of Armour Strip Wire (mm)	Min. Thickness of PVC Outer Sheath Wire Strip Armour (mm)	Overall Diameter (Approx.) Wire Strip Armour (mm)	Approx. Net Wt. of Cable Wire Strip Kg/Km	Max. D.C. Resistance at 20°C Ohms/Km	Max. A.C. Resistance at 90°C Ohms/Km	Approx. Reactance at 50 Hz Ohms/Km	Approx. Capacitance Ohms/Km	Current Ratings	
													Direct in Ground Amps	In Air Amps
2XWY	3C X 4	1	0.7	0.3	1.4	1.24	16.12	575	4.61	5.90	-	-	-	-
2XWY	3C X 6	1	0.7	0.3	1.4	1.24	17.00	710	3.08	3.94	-	-	-	-
2XWY/2XFY	3C X 10	7	0.7	0.3	1.4	1.24	19.00	840	1.83	2.34	-	-	-	-
2XWY/2XFY	3C X 16	7	0.7	0.3	4X0.8	1.4	20.00	1040	1.15	1.47	-	-	-	-
2XWY/2XFY	3C X 25	7	0.90	0.3	4X0.8	1.60	23.0	1373	0.727	0.930	0.080	0.20	119	108
2XWY/2XFY	3C X 35	7	0.90	0.3	4X0.8	1.60	25.0	1713	0.524	0.671	0.080	0.23	144	132
2XWY/2XFY	3C X 50	7	1.00	0.3	4X0.8	1.60	28.0	2171	0.387	0.495	0.078	0.24	174	162
2XWY/2XFY	3C X 70	19	1.10	0.4	4X0.8	2.00	32.0	3052	0.268	0.343	0.077	0.26	210	198
2XWY/2XFY	3C X 95	19	1.10	0.4	4X0.8	2.00	35.0	3868	0.193	0.247	0.074	0.29	252	240
2XWY/2XFY	3C X 120	19	1.20	0.4	4X0.8	2.00	39.0	4725	0.153	0.096	0.072	0.29	288	276
2XWY/2XFY	3C X 150	19	1.40	0.5	4X0.8	2.00	42.0	5691	0.124	0.159	0.072	0.29	324	318
2XWY/2XFY	3C X 185	37	1.60	0.5	4X0.8	2.50	44.0	7245	0.0991	0.127	0.072	0.29	360	366
2XWY/2XFY	3C X 240	37	1.70	0.6	4X0.8	2.50	49.0	9112	0.0754	0.0965	0.072	0.31	414	426
2XWY/2XFY	3C X 300	37	1.80	0.6	4X0.8	2.50	58.0	11087	0.0601	0.0769	0.071	0.33	462	480
2XWY/2XFY	3C X 400	61	2.00	0.7	4X0.8	3.15	65.0	14437	0.0470	0.0602	0.070	0.33	510	546

## 3 CORE COPPER XLPE UNARMoured POWER CABLES

Type	No. of cores & cross sectional area mm <sup>2</sup>	Min. No. of Wires	Thickness of XLPE insulation (Nom.) (mm)	Min. Thickness of PVC inner sheath (mm)	Nominal Thickness of PVC Outer Sheath (mm)	Overall Diameter (Approx.) (mm)	Approx. Net Wt. of Cable Kg/Km	Max. D.C. Resistance at 20°C Ohms/Km	Max. A.C. Resistance at 90°C Ohms/Km	Approx. Reactance at 50 Hz mFd/Km	Approx. Capacitance	Current Ratings	
												Direct in Ground Amps	In Air Amps
2XY	3C X 4	1	0.7	0.3	1.80	14.00	325	4.61	5.90	-	-	-	-
2XY	3C X 6	1	0.7	0.3	1.80	15.50	410	3.08	3.94	-	-	-	-
2XY	3C X 10	7	0.7	0.3	1.80	17.00	530	1.83	2.34	-	-	-	-
2XY	3C X 16	7	0.7	0.3	1.80	18.00	700	1.15	1.47	-	-	-	-
2XY	3C X 25	7	0.90	0.3	2.00	21.0	935	0.727	0.930	0.080	0.20	119	108
2XY	3C X 35	7	0.90	0.3	2.00	23.0	1219	0.524	0.671	0.080	0.23	144	132
2XY	3C X 50	7	1.00	0.3	2.00	25.0	1578	0.387	0.495	0.078	0.24	174	162
2XY	3C X 70	19	1.10	0.4	2.20	29.0	2222	0.268	0.343	0.077	0.26	210	198
2XY	3C X 95	19	1.10	0.4	2.20	32.0	2948	0.193	0.247	0.074	0.29	252	240
2XY	3C X 120	19	1.20	0.4	2.20	35.0	3659	0.153	0.196	0.072	0.29	288	276
2XY	3C X 150	19	1.40	0.5	2.40	39.0	4511	0.124	0.159	0.072	0.29	324	318
2XY	3C X 185	37	1.60	0.5	2.60	43.0	5600	0.0991	0.127	0.072	0.29	360	366
2XY	3C X 240	37	1.70	0.6	2.80	48.0	7249	0.0754	0.0965	0.072	0.31	414	426
2XY	3C X 300	37	1.80	0.6	3.00	53.0	9001	0.0601	0.0769	0.071	0.33	462	480
2XY	3C X 400	61	2.00	0.7	3.20	59.0	11429	0.0470	0.0602	0.070	0.33	510	546

# ELECTROLITE 3.5 CORE ALUMINIUM CONDUCTOR XLPE INSULATED ARMoured CABLES CONFIRMING TO IS : 7098 (PART-1)

Type	No. of cores & cross sectional area mm <sup>2</sup>	Min. No. of Wires	Thickness of insulation (Nom.) (mm)	Min. Thickness of inner Sheath (mm)	Nominal Dimensions of Armour Wire Strip (mm)	Min. Thickness of Outer Sheath Wire Strip Armour (mm)	Overall Diameter (Approx.) Wire Strip Armour (mm)	Approx. Net Wt. of Cable Wire Strip Armour Kg/Km	Max. D. C. Resistance at 20°C Ohms/Km	Max. A. C. Resistance 90°C Ohms/Km	Approx. Reactance at 50 Hz Ohms/Km	Approx. Capacitance Ohms/Km	Current Ratings					
													Direct in Ground Amps	In Air Amps				
A2xfy/A2xwy	3.5CX25	7/7	0.9	0.7	1.60	4X0.8	1.40	1.40	25	23	1110	870	1.2000	1.5400	0.080	0.20	94	96
A2xfy/A2xwy	3.5CX35	7/7	0.9	0.7	1.60	4X0.8	1.40	1.40	27	25	1290	1030	0.8680	1.1100	0.080	0.23	113	117
A2xfy/A2xwy	3.5CX50	7/7	1.0	0.9	1.60	4X0.8	1.56	1.40	30	28	1580	1230	0.6410	0.8200	0.078	0.24	133	142
A2xfy/A2xwy	3.5CX70	19/7	1.1	0.9	2.00	4X0.8	1.56	1.56	34	32	2170	1610	0.4430	0.5670	0.077	0.26	164	179
A2xfy/A2xwy	3.5CX95	19/7	1.1	1.0	2.00	4X0.8	1.56	1.56	38	35	2620	2000	0.3200	0.4100	0.074	0.29	196	221
A2xfy/A2xwy	3.5CX120	19/19	1.2	1.1	2.00	4X0.8	1.72	1.72	42	39	3160	2460	0.2530	0.3250	0.072	0.29	223	257
A2xfy/A2xwy	3.5CX150	19/19	1.4	1.1	2.00	4X0.8	1.88	1.72	46	43	3670	2840	0.2060	0.2650	0.072	0.29	249	292
A2xfy/A2xwy	3.5CX185	37/19	1.6	1.1	2.50	4X0.8	2.04	1.88	51	47	4780	3480	0.1640	0.2110	0.072	0.29	282	337
A2xfy/A2xwy	3.5CX240	37/19	1.7	1.2	2.50	4X0.8	2.20	2.04	57	53	5780	4290	0.1250	0.1620	0.072	0.31	326	399
A2xfy/A2xwy	3.5CX300	37/19	1.8	1.4	2.50	4X0.8	2.36	2.20	61	57	6790	5170	0.1000	0.1300	0.071	0.33	367	455
A2xfy/A2xwy	3.5CX400	61/37	2.0	1.6	3.15	4X0.8	2.68	2.52	71	66	9040	6480	0.0778	0.1023	0.070	0.33	418	530

## 3.5 CORE ALUMINIUM XLPE UNARMoured POWER CABLES

Type	No. of cores & cross sectional area	Min. No. of Wires	Thickness of insulation (mm)	Min. Thickness of inner sheath (mm)	Nominal Thickness of Outer Sheath (mm)	Overall Diameter (Approx.) (mm)	Net Wt. of Cable (Approx.) Kg/Km	Max. D. C. Resistance at 20°C Ohms/Km	Max. A. C. Resistance 90°C Ohms/Km	Approx. Reactance at 50 Hz Ohms/Km	Approx. Capacitance mF/d/Km	Current Ratings	
												Direct in Ground Amps	In Air Amps
A2xy	3.5CX25	7/7	0.90	0.70	2.00	22	600	1.2000	1.5400	0.080	0.20	94	96
A2xy	3.5CX35	7/7	0.90	0.70	2.00	25	720	0.8680	1.1100	0.080	0.23	113	117
A2xy	3.5CX50	7/7	1.00	0.90	2.00	27	910	0.6410	0.8200	0.078	0.24	133	142
A2xy	3.5CX70	19/7	1.10	0.90	2.20	31	1230	0.4430	0.5670	0.077	0.26	164	179
A2xy	3.5CX95	19/7	1.10	1.00	2.20	35	1550	0.3200	0.4100	0.074	0.29	196	221
A2xy	3.5CX120	19/19	1.20	1.10	2.20	38	2050	0.2530	0.3250	0.072	0.29	223	257
A2xy	3.5CX150	19/19	1.40	1.10	2.40	42	2300	0.2060	0.2650	0.072	0.29	249	292
A2xy	3.5CX185	37/19	1.60	1.10	2.60	47	2860	0.1640	0.2110	0.072	0.29	282	337
A2xy	3.5CX240	37/19	1.70	1.20	2.80	52	3610	0.1250	0.1620	0.072	0.31	326	399
A2xy	3.5CX300	37/19	1.80	1.40	3.00	57	4410	0.1000	0.1300	0.071	0.33	367	455
A2xy	3.5CX400	61/37	2.00	1.60	3.40	66	5650	0.0778	0.1023	0.070	0.33	418	530

# ELECTROLITE 3.5 CORE COPPER CONDUCTOR XLPE INSULATED ARMoured CABLES CONFIRMING TO IS : 7098 (PART-1)

Type	No. of cores & cross sectional area mm <sup>2</sup>	Min. No. of Wires	Thickness of XLPE insulation (Nom.) (mm)	Min. Thickness of PVC inner Sheath (mm)	Nominal Dimensions of PVC Strip Wire (mm)	Min. Thickness of PVC Outer Sheath Wire (mm)	Overall Diameter (Approx.) Wire Strip (mm)	Approx. Net Wt. of Cable Wire Strip Kg/Km	Max. D.C. Resistance at 20°C Ohms/Km	Max. A.C. Resistance at 90°C Ohms/Km	Approx. Reactance at 50 Hz Ohms/Km	Approx. Capacitance Ohms/Km	Current Ratings	
													Direct in Ground Amps	In Air Amps
2XWY/2XFY	3.5CX25/16	7/7	0.9 0.7	0.3	4X0.8	1.40	25.0	1583	0.727	0.930	0.080	0.20	199	108
2XWY/2XFY	3.5CX35/16	7/7	0.9 0.7	0.3	4X0.8	1.40	27.0	1925	0.524	0.671	0.080	0.23	144	132
2XWY/2XFY	3.5CX50/25	7/7	1.0 0.9	0.3	4X0.8	1.40	30.0	2468	0.387	0.495	0.078	0.24	174	162
2XWY/2XFY	3.5CX70/35	19/7	1.1 0.9	0.4	4X0.8	1.56	34.0	3465	0.268	0.343	0.077	0.26	210	198
2XWY/2XFY	3.5CX95/50	19/7	1.1 1.0	0.4	4X0.8	1.56	38.0	4426	0.193	0.247	0.074	0.29	252	240
2XWY/2XFY	3.5CX120/70	19/19	1.2 1.1	0.4	4X0.8	1.72	42.0	5498	0.153	0.196	0.072	0.29	288	276
2XWY/2XFY	3.5CX150/70	19/19	1.4 1.1	0.5	4X0.8	1.88	46.0	6473	0.124	0.159	0.072	0.29	324	318
2XWY/2XFY	3.5CX185/90	37/19	1.6 1.1	0.5	4X0.8	2.04	51.0	8333	0.0991	0.127	0.072	0.29	360	368
2XWY/2XFY	3.5CX240/120	37/19	1.7 1.2	0.6	4X0.8	2.20	57.0	10435	0.0754	0.0965	0.072	0.31	414	426
2XWY/2XFY	3.5CX300/150	37/19	1.8 1.4	0.6	4X0.8	2.36	61.0	12671	0.0601	0.0769	0.071	0.33	462	480
2XWY/2XFY	3.5CX400/185	61/37	2.0 1.6	0.7	4X0.8	2.68	71.0	16498	0.0470	0.0602	0.070	0.33	510	546

## 3.5 CORE COPPER XLPE UNARMoured POWER CABLES

Type	No. of cores & cross sectional area mm <sup>2</sup>	Min. No. of Wires	Thickness of XLPE insulation (Nom.) (mm)	Min. Thickness of PVC inner sheath (mm)	Nominal Thickness of PVC Outer Sheath (mm)	Overall Diameter (Approx.) (mm)	Approx. Net Wt. of Cable Kg/Km	Max. D.C. Resistance at 20°C Ohms/Km	Max. A.C. Resistance at 90°C Ohms/Km	Approx. Reactance at 50 Hz Ohms/Km	Approx. Capacitance mF/d/Km	Current Ratings	
												Direct in Ground Amps	In Air Amps
2XY	3.5CX25/16	7/7	0.9 0.7	0.3	2.00	22.0	1102	0.727	0.930	0.080	0.20	199	108
2XY	3.5CX35/16	7/7	0.9 0.7	0.3	2.00	25.0	1389	0.524	0.671	0.080	0.23	144	132
2XY	3.5CX50/25	7/7	1.0 0.9	0.3	2.00	27.0	1836	0.387	0.495	0.078	0.24	174	162
2XY	3.5CX70/35	19/7	1.1 0.9	0.4	2.20	31.0	2567	0.268	0.343	0.077	0.26	210	198
2XY	3.5CX95/50	19/7	1.1 1.0	0.4	2.20	35.0	3416	0.193	0.247	0.074	0.29	252	240
2XY	3.5CX120/70	19/19	1.2 1.1	0.4	2.20	38.0	4317	0.153	0.196	0.072	0.29	288	276
2XY	3.5CX150/70	19/19	1.4 1.1	0.5	2.40	42.0	5178	0.124	0.159	0.072	0.29	324	318
2XY	3.5CX185/90	37/19	1.6 1.1	0.5	2.60	47.0	6508	0.0991	0.127	0.072	0.29	360	368
2XY	3.5CX240/120	37/19	1.7 1.2	0.6	2.80	52.0	8389	0.0754	0.0965	0.072	0.31	414	426
2XY	3.5CX300/150	37/19	1.8 1.4	0.6	3.00	57.0	10401	0.0601	0.0769	0.071	0.33	462	480
2XY	3.5CX400/185	61/37	2.0 1.6	0.7	3.40	66.0	13271	0.0470	0.0602	0.070	0.33	510	546



## ELECTROLITE 4 CORE ALUMINIUM CONDUCTOR XLPE INSULATED ARMoured CABLES CONFIRMING TO IS : 7098 (PART-1)

Type	No. of cores & cross sectional area	Min. No. of Wires	Thickness of insulation (Nom.) (mm)	Min. Thickness of inner Sheath (mm)	Nominal Dimensions of Armour Strip Wire (mm)	Min. Thickness of Outer Sheath Wire Armour (mm)	Overall Diameter (Approx.) Wire Strip Armour (mm)	Approx. Net Wt. of Cable Wire Strip Kg/Km	Max. D.C. Resistance at 20°C Ohms/Km	Max. A.C. Resistance at 90°C Ohms/Km	Approx. Reactance at 500 Hz Ohms/Km	Approx. Capacitance mFd/Km	Current Ratings	
													Direct in Ground Amps	In Air Amps
A2xwy	4CX4	1	0.7	0.3	1.40	-	17	-	7.41	9.48	-	-	34	31
A2xwy	4CX6	1	0.7	0.3	1.40	-	19	-	4.61	5.90	-	-	43	40
A2xfy/A2xwy	4CX10	1	0.7	0.3	1.40	4X0.8	21	19.5	3.08	3.94	-	-	57	53
A2xfy/A2xwy	4CX16	7	0.7	0.3	1.60	4X0.8	22	21	1.91	2.45	-	-	73	70
A2xfy/A2xwy	4CX25	7	0.9	0.3	1.60	4X0.8	26	24	1.2	1.54	0.08	0.2	94	96
A2xfy/A2xwy	4CX35	7	0.9	0.3	1.60	4X0.8	28	26	1.11	0.868	0.08	0.23	113	117
A2xfy/A2xwy	4CX50	7	1	0.3	1.60	4X0.8	31	30	1.720	1.400	0.078	0.24	133	142
A2xfy/A2xwy	4CX70	19	1.1	0.4	2.00	4X0.8	36	34	2.410	1.800	0.077	0.26	164	179
A2xfy/A2xwy	4CX95	19	1.1	0.4	2.00	4X0.8	40	37	2.900	2.190	0.074	0.29	196	221
A2xfy/A2xwy	4CX120	19	1.2	0.5	2.00	4X0.8	44	42	3.480	2.690	0.072	0.29	223	257
A2xfy/A2xwy	4CX150	19	1.4	0.5	2.50	4X0.8	50	46	4.480	3.220	0.072	0.29	249	292
A2xfy/A2xwy	4CX185	37	1.6	0.6	2.50	4X0.8	55	51	5.330	3.920	0.072	0.29	282	337
A2xfy/A2xwy	4CX240	37	1.7	0.6	2.50	4X0.8	61	57	6.420	4.850	0.072	0.31	326	399
A2xfy/A2xwy	4CX300	37	1.8	0.7	3.15	4X0.8	68	63	8.360	5.900	0.071	0.33	367	455
A2xfy/A2xwy	4CX400	61	2	0.7	3.15	4X0.8	76	71	10.070	7.310	0.0778	0.1023	418	530

## ELECTROLITE 4 CORE ALUMINIUM CONDUCTOR XLPE INSULATED UNARMoured CABLES CONFIRMING TO IS : 7098 (PART-1)

Type	No. of cores & cross sectional area	Min. No. of Wires	Thickness of insulation (Nom.) (mm)	Min. Thickness of inner sheath (mm)	Nominal Thickness of Outer Sheath (mm)	Overall Diameter (Approx.) (mm)	Net Wt. of Cable (Approx.) Kg/Km	Max. D.C. Resistance at 20°C Ohms/Km	Max. A.C. Resistance at 90°C Ohms/Km	Approx. Reactance at 50 Hz Ohms/Km	Approx. Capacitance mFd/Km	Current Ratings	
												Direct in Ground Amps	In Air Amps
A2xy	4CX4	1	0.7	0.3	1.80	15	280	7.41	9.48	-	-	-	-
A2xy	4CX6	1	0.7	0.3	1.80	17	330	4.61	5.90	-	-	-	-
A2xy	4CX10	1	0.7	0.3	1.80	19	400	3.08	3.94	-	-	-	-
A2xy	4CX16	7	0.7	0.3	1.80	20	500	1.9100	2.4500	-	-	73	70
A2xy	4CX25	7	0.9	0.3	2.00	23	650	1.2000	1.5400	0.080	0.20	94	96
A2xy	4CX35	7	0.9	0.3	2.00	26	800	0.8680	1.1100	0.080	0.23	133	117
A2xy	4CX50	7	1.0	0.3	2.00	29	1000	0.6410	0.8200	0.078	0.24	133	142
A2xy	4CX70	19	1.1	0.4	2.20	33	1370	0.4430	0.56700	0.077	0.26	164	179
A2xy	4CX95	19	1.1	0.4	2.20	36	1740	0.3200	0.4100	0.074	0.29	196	221
A2xy	4CX120	19	1.2	0.5	2.40	41	2170	0.2530	0.3250	0.072	0.29	223	257
A2xy	4CX150	19	1.4	0.5	2.60	45	2630	0.2060	0.2650	0.072	0.29	249	292
A2xy	4CX185	37	1.6	0.5	2.80	50	3250	0.1640	0.2110	0.072	0.29	282	337
A2xy	4CX240	37	1.7	0.6	3.00	56	4110	0.1250	0.1620	0.072	0.31	326	399
A2xy	4CX300	37	1.8	0.7	3.20	66	5070	0.1000	0.1300	0.071	0.33	367	455
A2xy	4CX400	61	2.0	0.7	3.60	71	6420	0.0778	0.1023	0.070	0.33	418	530

## ELECTROLITE 4 CORE COPPER CONDUCTOR XLPE INSULATED ARMoured CABLES CONFIRMING TO IS : 7098 (PART-1)

Type	No. of cores & cross sectional area mm <sup>2</sup>	Min. No. of Wires	Thickness of XLPE insulation (Nom.) (mm)	Min. Thickness of PVC inner sheath (mm)	Nominal Dimensions of Armour		Min. Thickness of Outer Sheath		Overall Diameter (Approx.)	Approx. Net Wt. of Cable		Max. D.C. Resistance at 20°C Ohms/Km	Max. A.C. Resistance at 90°C Ohms/Km	Approx. Reactance at 50 Hz Ohms/Km	Approx. Capacitance mFd/Km	Current Ratings	
					Strip (mm)	Wire (mm)	Wire (mm)	Strip (mm)		Wire Kg/Km	Strip Kg/Km					Direct in Ground Amps	In Air Amps
2XWY	4C X 4	1	0.7	0.3	-	1.40	1.24	-	17.0	-	650	4.61	5.90	-	-	-	-
2XWY	4C X 6	1	0.7	0.3	-	1.40	1.24	-	19.0	-	800	3.08	3.90	-	-	-	-
2XWY/2XFY	4C X 10	7	0.7	0.3	4X0.8	1.40	1.40	1.40	21.0	19.50	1010	1.83	2.34	-	-	-	-
2XWY/2XFY	4C X 16	7	0.70	0.3	4X0.8	1.60	1.40	1.40	22.0	21.0	1210	1.15	1.47	0.080	0.36	92	79
2XWY/2XFY	4C X 25	7	0.90	0.3	4X0.8	1.60	1.40	1.40	26.0	24.0	1709	0.727	0.930	0.080	0.20	119	108
2XWY/2XFY	4C X 35	7	0.90	0.3	4X0.8	1.60	1.40	1.40	28.0	26.0	2154	0.524	0.671	0.080	0.23	144	132
2XWY/2XFY	4C X 50	7	1.00	0.3	4X0.8	1.60	1.56	1.56	31.0	30.0	2732	0.387	0.495	0.078	0.24	174	162
2XWY/2XFY	4C X 70	19	1.10	0.4	4X0.8	2.00	1.56	1.56	36.0	34.0	3887	0.268	0.343	0.077	0.26	210	198
2XWY/2XFY	4C X 95	19	1.10	0.4	4X0.8	2.00	1.72	1.56	40.0	37.0	4299	0.193	0.247	0.074	0.29	252	240
2XWY/2XFY	4C X 120	19	1.20	0.5	4X0.8	2.00	1.88	1.72	44.0	42.0	6583	0.153	0.196	0.072	0.29	288	276
2XWY/2XFY	4C X 150	19	1.40	0.5	4X0.8	2.50	2.04	1.88	50.0	46.0	7702	0.124	0.159	0.072	0.29	324	318
2XWY/2XFY	4C X 185	37	1.60	0.5	4X0.8	2.50	2.20	2.04	55.0	51.0	9377	0.0991	0.127	0.072	0.29	360	366
2XWY/2XFY	4C X 240	37	1.70	0.6	4X0.8	2.50	2.36	2.20	61.0	57.0	11776	0.0754	0.0965	0.072	0.31	414	426
2XWY/2XFY	4C X 300	37	1.80	0.7	4X0.8	3.15	2.52	2.36	68.0	63.0	15072	0.0601	0.0769	0.071	0.33	462	480
2XWY/2XFY	4C X 400	61	2.00	0.7	4X0.8	3.15	2.84	2.68	76.0	71.0	18669	0.0470	0.0602	0.070	0.33	510	546

## ELECTROLITE 4 CORE COPPER CONDUCTOR XLPE INSULATED UNARMoured CABLES CONFIRMING TO IS : 7098 (PART-1)

Type	No. of cores & cross sectional area mm <sup>2</sup>	Min. No. of Wires	Thickness of XLPE insulation (Nom.) (mm)	Min. Thickness of PVC inner sheath (mm)	Nominal Thickness of PVC Outer Sheath (mm)	Overall Diameter (Approx.) (mm)	Approx. Net Wt. of Cable Kg/Km	Max. D.C. Resistance at 20°C Ohms/Km	Approx. Reactance at 50 Hz Ohms/Km	Approx. Capacitance mFd/Km	Current Ratings	
											Direct in Ground Amps	In Air Amps
2XY	4C X 4	1	0.7	0.3	1.80	15.0	380	4.61	-	-	-	-
2XY	4C X 6	1	0.7	0.3	1.80	17.0	480	3.08	-	-	-	-
2XY	4C X 10	7	0.7	0.3	1.80	19.0	600	1.85	-	-	-	-
2XY	4C X 16	7	0.70	0.3	1.80	20.0	713	1.15	0.080	0.36	92	79
2XY	4C X 25	7	0.90	0.3	2.00	23.0	1193	0.727	0.080	0.20	119	108
2XY	4C X 35	7	0.90	0.3	2.00	26.0	1566	0.524	0.080	0.23	144	132
2XY	4C X 50	7	1.00	0.3	2.00	29.0	2057	0.387	0.078	0.24	174	162
2XY	4C X 70	19	1.10	0.4	2.20	33.0	2898	0.268	0.077	0.26	210	198
2XY	4C X 95	19	1.10	0.4	2.20	36.0	3858	0.193	0.074	0.29	252	240
2XY	4C X 120	19	1.20	0.5	2.40	41.0	5324	0.153	0.072	0.29	288	276
2XY	4C X 150	19	1.40	0.5	2.60	45.0	5947	0.124	0.072	0.29	324	318
2XY	4C X 185	37	1.60	0.5	2.80	50.0	7400	0.0991	0.072	0.29	360	366
2XY	4C X 240	37	1.70	0.6	3.00	56.0	9584	0.0754	0.072	0.31	414	426
2XY	4C X 300	37	1.80	0.7	3.20	63.0	11948	0.0601	0.071	0.33	462	480
2XY	4C X 400	61	2.00	0.7	3.60	71.0	15207	0.0470	0.070	0.33	510	546



**AERIAL BUNCHED  
CABLES  
AS PER IS : 14255**

**14255**



## **LT AERIAL BUNCHED CABLES**

With the growing need for long term economy, safety and reliability overhead conductors are now being replaced by LT Aerial Bunched Cables in distribution network with limited space for clearance.

### **APPLICATION**

Aerial Bunched Cables are specially suitable for the following types of installation conditions.

- Where space is limited like those in densely populated area, dense forests.
- Where existing Over Head distribution feeder capacity have to be up graded without raising the system voltage with limited budget.
- Temporary installations or for those regions where building plans have not been fully approved.

### **ADVANTAGES**

- Safest system because phase conductors are insulated, no risk or danger of accidental touching live conductor.
- Accidental short circuit eliminated.
- Supply interruptions minimized thus the life of Transformers increased.
- Reduction in pole height, elimination of insulators and associated hardwares lowering total cost of system.
- It can be fixed to poles, walls or trees thus easy and economical to install.
- Multiple circuits of Power & Telephone Cables can be strung in the same set of Poles or any other supports.

## LT AERIAL BUNCHED CABLES

The LT Aerial Bunched Cables consist of insulated phase conductors (with additional street lighting conductor if provided) are twisted around the bare/insulated aluminium alloy messenger conductor, which takes all the mechanical stress and also serve as the earth cum neutral conductor.

The Phase conductor and street lighting conductor are insulated with Black weather resistant polyethylene or cross linked polyethylene.

### LT AERIAL BUNCHED CABLES AS PER IS: 14255-1995 SIZE AND REQUIREMENT OF PHASE, STREET LIGHTING AND MESSENGER CONDUCTOR

PHASE CONDUCTOR (ALUMINIUM)			STREET LIGHTING CONDUCTOR (ALUMINIUM)			MESSENGER CONDUCTOR (ALUMINIUM ALLOY)		
Nominal Area	Maximum Conductor D.C. Resistance at 20 Deg. C	Nominal Thickness of Insulation XLPE/PE	Nominal Area	Maximum Conductor D.C. Resistance at 20 Deg. C	Nominal Thickness of Insulation XLPE/PE	Nominal Area	Maximum Conductor D.C. Resistance at 20 Deg. C	Minimum Breaching load
Sq. mm	Ohm/km	mm	Sq. mm	Ohm/km	mm	Sq. mm	Ohm/km	KN
16	1.91	1.2	16	1.91	1.2	25	1.38	7
25	1.20	1.2	16	1.91	1.2	25	1.38	7
35	0.868	1.2	16	1.91	1.2	25	1.38	7
50	0.641	1.5	16	1.91	1.2	35	0.986	9.8
70	0.443	1.5	16	1.91	1.2	50	0.689	14
95	0.320	1.5	16	1.91	1.2	70	0.492	19.7

### COMPOSITION AND DESIGNATION OF LT AERIAL BUNCHED CABLES AS PER REC SPECIFICATION No. 32

DESIGNATION	COMPLETE BUNCHED CABLES	
	APPROX OVERALL DIA mm	APPROX, TOTAL MASS kg/km
3 x 16 +25	19	250
3 x 16+ 16 + 25	19	310
3 x 25+ 25	22	330
3 x 25+ 16 +25	22	390
3 x 35 + 25	24	430
3 x 35+ 16 +25	24	490
3 x 50 + 35	32	580
3 x 50+ 16 + 35	32	640

The first part for phase conductor, middle for street lighting conductor and last for bare messenger conductor.

**LT AERIAL BUNCHED CONDUCTOR (ABC) POLYMERIC INSULATED  
AS PER BS 7870 (PY-5) 1999**

Nominal Cross Sectional Area of Conductor Sqmm	Maximum D.C. resistance at 20 Deg. C. Ohm/km	Minimum Average Thickness of XLPE Insulation mm	Ultimate tensile strength of conductor KN
25	1.20	1.3	4.1
35	0.868	1.3	5.6
50	0.641	1.5	7.6
70	0.443	1.5	11
95	0.320	1.7	15.3
120	0.253	1.7	19.4

**CHARACTERISTICS OF CONDUCTOR AND CORES FOR LT AERIAL BUNCHED CABLES  
AS PER NF C 33-209**

DESIGNATION		CONDUCTOR					Average Thickness of Insulating Sheath Specified Value (mm)	Core	
Type	Nominal Cross Sectional Area Sqmm	Number of Strands	Maximum Linear Resistance at 20 Deg.C Ohm/km	Minimum Conductor Diameter (mm)	Breaking strength			Outside Diameter	
					Minimum (daN)	Maximum (daN)	Minimum (mm)	Maximum (mm)	
Phase of Neutral Non Return	16	7	1.91	4.7	190	290	1.2	7.0	7.9
	25	7	1.20	6.0	300	450	1.4	8.7	9.6
	35	7	0.868	7.0	420	630	1.6	10.1	11.1
	50	7	0.641	8.2	600	900	1.6	11.3	12.3
	70	12	0.443	9.8	840	126	1.8	13.3	14.3
Neutral Return	54.6	7	0.63	9.2	1660	-	1.6	12.3	13.0

**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	Size in sq. mm	Conductor Construction	Max cond. resistance in ohm/km at 20°C
		Single core & Multi core			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	0.0991
6.0*	1/2.76	3.080	240	61/2.24	0.0754
10	7/1.35	1.830	300	61/2.50	0.0601
16	7/1.70	1.150	400	61/2.85	0.0470
25	7/2.14	0.727	500	61/3.20	0.0366
35	7/2.50	0.524	630	91/3.00	0.0283
50	7/3.00	0.387			
70	19/2.14	0.268	800	127/2.83	0.0221
95	19/2.50	0.193	1000	127/3.16	0.0176

**CURRENT RATING OF ELECTROLITE COPPER ARMoured / UNARMoured CABLES  
650/1100 V GRADE IN AIR**

Area Sq. mm	Twin Core Amp.	3, 3.5, 4 Core Amp.	Area Sq. mm	Twin Core Amp.	3, 3.5, 4 Core Amp.
1.5	20	17	70	195	165
2.5	27	24	95	230	200
4	35	30	120	265	235
6	45	39	150	305	265
10	60	52	185	350	305
16	78	66	240	410	355
25	105	90	300	465	400
35	125	110	400	530	455
50	155	135			

# FLEXIBLE COPPER HOUSEWIRE, ALUMINIUM UNSHEATHED & SHEATHED CABLES

**694-2010**



**ELECTROLITE** brand, PVC insulated LT Light Duty Cables are as per IS:694-1990 and are suitable for fixed wiring and flexible operation.

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

## **CONDUCTOR CONSTRUCTION :**

The most economical construction for conductors is solid conductor i.e. conductor is made of one single wire. As the area of conductor increases, 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 etc. formations.

In case of conductors used for flexible cables, number of fine copper strands are twisted in one direction to form a bunched conductor. In case of bigger size conductors, number of such bunched conductors are stranded in rope construction to form the conductor. Where crimping of lugs are required the conductor has to be stranded or bunched construction only.

The construction of conductors as per IS-694 is as follows, and they must comply with IS-8130/1984 which is the specification for conductors for electric cables.

<b>Nominal Cross-sectional Area Copper</b>	<b>Aluminium</b>	<b>Solid/Stranded</b>	<b>Flexibility Class As per IS-8130</b>
Upto and including 6.0 Sq. mm	Upto and including 10 Sq.mm	Solid/Stranded	Class 1 or Class 2
Above 6.0 Sq. mm	Above 6.0 Sq. mm	Standard	Class 2
Flexible cables of all sizes	-----	Bunched	Class 5



As per the international practice which is also adopted by ISI, the size of the conductor is decided by its resistance only. The constructions of the conductor mentioned in the following tables are only for guidance and are as per market convention. It may vary within the prescribed limits of IS-8130.

### INSULATION :

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

As per IS-694 the insulation should be of Type A PVC compound as per IS-5831 and it is suitable for 70°C continuous operation.

The following colour code is used for identification :

<b>Cable for fixed wiring</b>	<b>&amp;</b>	<b>Flexible Cables</b>
1 Core	Red, Black, Yellow, Blue White or Grey	Red, Black, Yellow, Blue White or Grey
2 Core	Red and Black	Red and Black
3 Core	Red, Yellow, Blue	Red, Black, Green / Yellow
4 Core	Red, Yellow, Blue and Black	Red, Yellow, Blue, Green-Yellow
5 Core	Red, Yellow, Blue, Black, Grey	Red, Yellow, Blue, Black, Green-Yellow
6 Core & above	Two adjacent cores Blue and Yellow (counting and direction cores) and remaining Grey in each layer. OR By different colours and helical colour marking on cores.	

### LAYING UP :

In case of multicore cables the cores are laid up with suitable lay.

### SHEATH :

The PVC coating on core of single core cables and on laid up cores in case of multi-core cables is called SHEATH. As per IS-694 it should be of Type ST-1 PVC compound as per IS-5831. It is suitable for 70° C continuous operation.

### SHEATH COLOUR :

The colour of the sheath is generally Black. We can supply other colours also on request.

### CABLE CODE :

The following codes are used for designating the cables as per IS-694.

### DELIVERY LENGTH :

The cables are generally delivered in 100 mtrs coils wrapped with Polyethylene/Hessian.

The bigger size cables are supplied on wooden drums.

**TABLE NO. 1**  
**ELECTROLITE SINGLE CORE PLAIN COPPER/ALLUMINIUM CONDUCTOR PVC INSULATED UNSHEATHED AND PVC SHEATHED 650/1100 V, HOUSE WIRES AS PER IS-694/1990 WITH ISI MARK**

Conductor Area Sq. mm	Conductor Construction	Max DC Conductor resistance at 20°C In Ohm/Km		Unsheathed Insulation thickness nominal mm	Cable Overall Diameter Approx. mm	Insulation thickness nominal mm	Sheathed Cable		Current Rating amp	
		Copper	Aluminium				Sheath Thickness Nominal mm	Overall Diameter Approx. mm	Copper	Aluminium
1.00	1/1.12	18.10	--	060	2.60	0.60	0.80	4.10	10	8
1.50	1/1.38	12.10	18.100	0.70	2.90	0.60	0.80	4.40	13	10
2.50	1/1.78	7.41	12.100	0.80	3.50	0.70	0.80	5.00	20	15
4.00	1/2.24	4.61	7.410	0.80	4.00	0.80	0.90	5.85	26	20
6.00	1/2.76	3.08	4.610	0.80	4.50	0.80	0.90	6.50	35	27
10.00	1/3.55 AL	--	3.080	1.00	5.70	1.00	0.90	7.55	--	34
	7/1.35 CU	1.830	--	1.00	6.20	1.00	0.90	8.05	44	--
16.00	7/1.70	1.150	1.910	1.00	7.20	1.00	1.00	9.30	55	43
25.00	7/2.14	0.727	1.200	1.20	8.90	1.20	1.10	11.20	75	58
35.00	7/2.50	0.524	0.868	1.20	10.00	1.20	1.10	12.30	90	70
50.00	19/1.78	0.387	0.641	1.40	11.90	1.40	1.20	14.40	120	92
70.00	19/2.14	0.268	0.443	1.40	13.60	--	--	--	150	116
95.00	19/2.50	0.193	0.320	1.60	15.80	--	--	--	175	135
120.00	37/2.03	0.153	0.253	1.60	17.50	--	--	--	200	155
150.00	37/2.24	0.124	0.206	1.80	19.40	--	--	--	230	175
185.00	37/2.50	0.0991	0.164	2.00	21.70	--	--	--	265	205
240.00	61/2.24	0.0754	0.125	2.20	24.80	--	--	--	315	245
300.00	61/2.50	0.0601	0.100	2.40	27.50	--	--	--	370	285
400.00	61/2.85	0.0470	0.0778	2.60	31.10	--	--	--	450	350
500.00	61/3.20	0.0366	0.0605	2.80	34.60	--	--	--	530	410
630.00	91/3.00	0.0283	0.0469	2.80	38.80	--	--	--	590	455

**TABLE NO. 2  
ELECTROLITE PLAIN COPPER CONDUCTOR, PVC INSULATED UNSHEATHED 650/1100 V, SINGLE CORE  
CABLE FOR PANEL BOARD WIRING AS PER IS-694/1990 WITH ISI MARK (UP TO 50 SQ.MM)**

Area in Sq. mm	Conductor Construction in General	Cond. dia mm	Max. DC resistance Ohm/Km at 20°C	Insulation Thickness in mm	Cable dia (Appx.)	Current Rating in Amp.	Area in Sq. mm	Conductor Construction	Conductor for dia in mm	Max. DC resistance Ohm/Km 20°C	Insulation Thickness in mm Nominal	Cable dia (Appx.) in mm	Current Rating Amp.
0.50	16/0.20	0.94	39.00	0.60	2.20	4	35	276/0.40	8.70	0.554	1.20	11.3	91
0.75	24/0.20	1.20	26.00	0.60	2.50	7	50	396/0.40	10.60	0.386	1.40	13.5	120
1.00	32/0.20	1.34	19.50	0.60	2.60	11	70	360/0.50	12.30	0.272	1.60	15.5	161
1.50	*30/0.25	1.64	13.30	0.70	2.90	14	95	485/0.50	14.70	0.206	1.80	18.5	200
2.50	**50/0.25	2.08	7.98	0.80	3.50	19	120	608/0.50	16.70	0.161	2.00	20.9	225
4.00	56/0.30	2.61	4.95	0.80	4.30	26	150	750/0.50	18.30	0.129	2.00	22.5	240
<b>Note : Cable above 50 Sq. mm are not covered by IS:694 But are as per IS:2465</b>													
6	84/0.30	3.50	3.300	0.80	5.30	31	185	925/0.50	20.00	0.106	2.2	24.6	300
10	140/0.30	4.60	1.910	1.00	6.70	42	240	1221/0.50	23.00	0.0801	2.2	27.6	425
16	126/0.40	6.00	1.210	1.00	8.20	57	300	1527/0.50	27.20	0.0641	2.4	32.2	475
25	196/0.40	7.60	0.780	1.20	10.00	71	400	2036/0.50	30.50	0.0486	2.6	35.7	550

\*This size can be supplied in 48/0.2 construction.      \*\*This size can be supplied in 80/0.2 construction.

**ELECTROLITE PLAIN COPPER CONDUCTOR, PVC INSULATED AND SHEATHED 650/1100 V,  
MULTICORE FLEXIBLE CABLE AS PER IS-694/1990 WITH ISI MARK**

Area Sq. mm	Construction No./Dia	Cond. dia in mm	Max. DC resistance Ohm/Km at 20°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	11
1.50	*30/0.25	1.64	13.30	0.60	2.90	0.90	0.90	0.90	7.60	8.10	9.00	14
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	19
4.00	56/0.3	2.61	4.95	0.70	4.30	1.00	1.00	1.00	10.60	11.30	12.40	26

\*This size can be supplied in 48/0.2 construction.    \*\*This size can be supplied in 80/0.2 construction.

**TABLE NO. 4  
ELECTROLITE PLAIN COPPER CONDUCTOR, PVC INSULATED AND SHEATHED 650/1100 VOLTS,  
MULTICORE FLEXIBLE CABLES**

Area Sq. mm	Construction No./Dia	Cond. dia in mm	Max. DC resistance Ohm/Km at 20°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	84/0.3	3.50	3.30	0.80	5.10	1.15	1.15	1.40	12.60	13.40	15.20	31
10	140/0.3	4.60	1.91	1.00	6.60	1.40	1.40	1.40	16.00	17.00	18.80	42
16	126/0.4	6.00	1.21	1.00	8.00	2.00	2.00	1.40	18.80	20.10	22.20	57
25	196/0.4	7.60	0.780	1.20	10.00	2.00	2.00	2.00	24.00	25.60	28.20	71
35	276/0.4	8.70	0.554	1.20	11.10	2.00	2.00	2.00	26.30	28.00	31.00	91
50	396/0.4	10.60	0.386	1.40	13.40	2.00	2.00	2.00	30.90	33.00	36.50	120
70	360/0.5	12.30	0.272	1.40	15.10	2.00	2.20	2.40	34.20	37.00	41.00	160
95	485S/0.5	14.70	0.206	1.60	17.90	2.20	2.40	2.40	40.20	43.50	47.80	190

**TABLE NO. 5**  
**ELECTROLITE 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 <b>MM</b>		0.94	1.20	1.34	1.64	2.08	2.61
Avg. Insu. thickness in <b>MM</b>		0.60	0.60	0.60	0.60	0.70	0.80
Core Dia. in <b>MM</b>		2.20	2.50	2.60	2.90	3.50	4.30
<b>No. of Cores</b>							
6	Avg. Sheath thickness <b>MM</b>	0.90	1.00	1.00	1.00	1.10	1.20
	App. Overall Dia <b>MM</b>	8.50	9.50	9.80	10.70	12.70	15.30
7	Avg. Sheath thickness <b>MM</b>	0.90	1.00	1.00	1.00	1.10	1.20
	App. Overall Dia <b>MM</b>	8.50	9.50	9.80	10.70	12.70	15.30
8	Avg. Sheath thickness <b>MM</b>	1.00	1.00	1.00	1.10	1.20	1.30
	App. Overall Dia <b>MM</b>	9.30	10.40	10.70	11.90	14.10	16.90
10	Avg. Sheath thickness <b>MM</b>	1.00	1.10	1.10	1.10	1.30	1.40
	App. Overall Dia <b>MM</b>	10.80	12.20	12.60	13.80	16.60	20.00
12	Avg. Sheath thickness <b>MM</b>	1.00	1.10	1.10	1.10	1.30	1.40
	App. Overall Dia <b>MM</b>	11.20	12.60	13.00	14.30	17.20	20.70
14	Avg. Sheath thickness <b>MM</b>	1.10	1.10	1.10	1.20	1.30	1.40
	App. Overall Dia <b>MM</b>	12.00	13.30	13.70	15.20	18.10	21.80
16	Avg. Sheath thickness <b>MM</b>	1.10	1.20	1.20	1.20	1.40	1.50
	App. Overall Dia <b>MM</b>	12.60	14.20	14.60	16.00	19.30	23.20
19	Avg. Sheath thickness <b>MM</b>	1.10	1.20	1.30	1.30	1.40	1.50
	App. Overall Dia <b>MM</b>	13.20	14.90	15.60	17.10	20.30	24.50
24	Avg. Sheath thickness <b>MM</b>	1.20	1.30	1.30	1.40	1.40	1.50
	App. Overall Dia <b>MM</b>	15.60	17.60	18.20	20.20	23.80	28.80
30	Avg. Sheath thickness <b>MM</b>	1.30	1.30	1.30	1.40	1.40	1.50
	App. Overall Dia <b>MM</b>	16.80	18.70	19.30	21.50	25.70	30.60
	Max. Conductor Resistance in OHm/Km at 20°C	39.00	26.00	19.50	13.30	7.98	4.95
	Recommended Current Rating in AMP	4	7	11	14	19	26

\*This size can be supplied in 48/0.2 construction.      \*\*This size can be supplied in 80/0.2 construction.

**TABLE NO. 6**  
**HOUSE WIRING CABLES**  
**ELECTROLITE PLAIN ANNEALED COPPER CONDUCTOR SINGLE CORE PVC INSULATED AND**  
**UNSHEATHED F.I.A. / T.A.C. APPROVED**

Type	Size of Conductor		Size SWG	Thickness of Insulation inch	Overall Diameter inch	Current Rating Amp.
	Nominal area in Sq. inch	No. and dia of wires inch				
<b>BSS:2004</b> <b>650/1100 VOLTS</b>	0.0015	1/0.044	1/18	0.035	0.119	5
	0.0020	3/0.029	3/22	0.035	0.137	10
	0.0030	3/0.036	3/20	0.035	0.153	15
	0.0045	7/0.029	7/22	0.035	0.162	20
	0.0070	7/0.036	7/20	0.040	0.193	28
	0.0100	7/0.044	7/18	0.040	0.217	36
	0.0145	7/0.052	7/17	0.040	0.241	43
	0.0225	7/0.064	7/16	0.040	0.277	53
	<b>Sq.mm</b>	<b>mm</b>		<b>mm</b>	<b>mm</b>	
<b>BSS:6004</b> <b>600/1000 VOLTS</b>	1.00	1/1.13		0.80	2.9	11
	1.50	1/1.38		0.80	3.1	14
	2.50	1/1.78		0.80	3.5	19
	4	7/0.85		0.80	4.3	26
	6	7/1.04		0.80	4.9	31
	10	7/1.35		0.80	6.2	42

**TABLE NO. 7**  
**ELECTROLITE SINGLE CORE PVC INSULATED UNSHEATHED FLEXIBLE CABLES**  
**FOR HOUSE WIRING WITH COPPER CONDUCTOR F.I.A. / T.A.C. APPROVED**

Conductor Area in Sq. mm	Construction No. / Dia Strand in mm	Conductor Dia in mm	Average thickness of Insu. in mm	Overall Dia. in mm	Maximum Resistant per Km at 20°C	Recommended current Rating in Amp	Nearest Equivalent Sizes		
							SWG	INCH	MM
1.0	14/0.3	1.3	0.70	2.8	18.10	11	1/18	1/0.044	1/1.12
1.5	22/0.3	1.7	0.70	3.1	12.10	14	3/22	3/0.029	7/0.53
2.0*	28/0.3	1.9	0.80	3.5	9.40	17	3/20	3/0.036	7/0.67
2.5	36/0.3	2.2	0.80	3.8	7.41	20	3/20	3/0.036	7/0.67
3.0*	44/0.3	2.4	0.80	4.0	6.00	23	7/22	7/0.029	7/0.67
4.0	56/0.3	2.6	0.80	4.4	4.61	26	7/20	7/0.036	7/0.85
4.5*	65/0.3	2.7	1.00	4.8	4.10	30	7/20	7/0.036	7/0.85

\*These sizes are not covered by I.S. 694-1990 and hence will not carry I.S.I. mark.

### ESTIMATED FULL LOAD CURRENT FOR MOTORS

H.P	KW	Single Phase Amp.	Three Phase Amp.	Recommended Cables size Sq.mm
0.5	0.37	3.7	1.0	1.5 - Copper
0.8	0.55	5.0	1.3	1.5 - Copper
1.0	0.75	6.5	1.9	1.5 - Copper
1.5	1.10	11.5	2.6	1.5 - Copper
2.0	1.50	--	3.7	1.5 - Copper
3.0	2.20	--	4.8	1.5 - Copper
5.0	3.70	--	7.8	1.5 - Copper
7.5	5.50	--	11.2	1.5 - Copper
10.0	7.50	--	15.5	2.5 - Copper
12.5	9.30	--	19.0	2.5 - Copper
15.0	11.00	--	22.0	6 - Aluminium
20.0	15.00	--	29.0	10 - Aluminium
25.0	18.50	--	35.0	16 - Aluminium
30.0	22.00	--	40.0	16 - Aluminium
35.0	26.00	--	47.0	25 - Aluminium
40.0	30.00	--	53.0	25 - Aluminium
50.0	37.00	--	65.0	35 - Aluminium
60.0	45.00	--	80.0	50 - Aluminium
75.0	55.00	--	94.0	70 - Aluminium
100.0	75.00	--	127.0	95 - Aluminium
125.0	90.00	--	152.0	150 - Aluminium

In place of Aluminium Cable if Copper cables are to be used, take one size lower than size recommended for Aluminium cable i.e. for 75 H.P. 70 sq.mm Aluminium cable is recommended. If you desire to use Copper Cable then use 50 Sq. mm Copper cable for 75 H.P. Motor.

## HANDLING STORAGE AND LAYING OF ELECTROLITE NOT REQUITED CABLES

- A) HANDLING** : 1) The cable with or without drum shall not be thrown or dropped on the ground from the carriers such as trucks or railway wagons, during unloading.
- 2) The cable drum shall be unloaded with the help of cranes or fork lifts or using a proper ramp having inclination 1:3 to 1:4 in order to avoid mechanical damage to the outer layers of cables.
- 3) The cable drums shall be lifted or stored with its flanges always vertical.
- 4) The cable drum shall be rolled in the direction of arrow only, in order to avoid loosening of cable winding. The drum shall not be rolled on rocky, uneven surface and for longer distances, it may damage the drum and cable.
- B) STORAGE** : 1) The cables shall be stored in dry covered places having concrete / firm surface capable or bearing the load of drum.
- 2) The cable ends shall be sealed properly in order to prevent moisture ingress.
- 3) Antirodent / termite repulsion treatment shall be applied to the site where the drum are stored for very long period of time.
- C) LAYING** : 1) ELECTROLITE recommends 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 shaft supported both ends with suitable jacks stands.
- 4) 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.
- 5) Suitable protection shall be provided to the cables against mechanical damages, it includes covers, pipes etc.
- D) Recommended minimum bending radius for 1100 volts heavy duty cables :**
- Single Core -  $15 \times D$  Where D = Diameter of cable in mm
- Multi Core -  $12 \times D$
- E) Recommended safe Pulling force with stockings :**
- a) For Unarmoured Cable :  $P = 5 D^2$  Where P - Pulling Force
- b) For Armoured Cable :  $P = 9 D^2$  D = Diameter of cable in mm
- F) Recommended safe pulling force when pulled with pulling eye :**
- a) For Aluminium Conductors :  $30 \text{ N/mm}^2$
- b) For Copper Conductor :  $50 \text{ N/mm}^2$

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



## RECOMMEDATION FOR INSTALLATION & TESTING

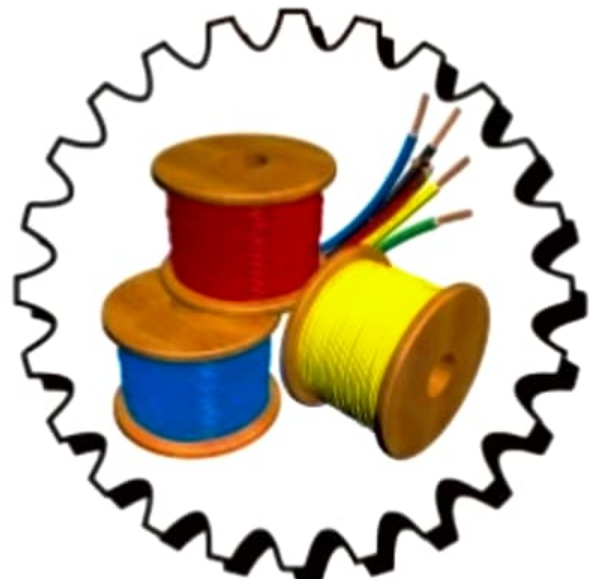
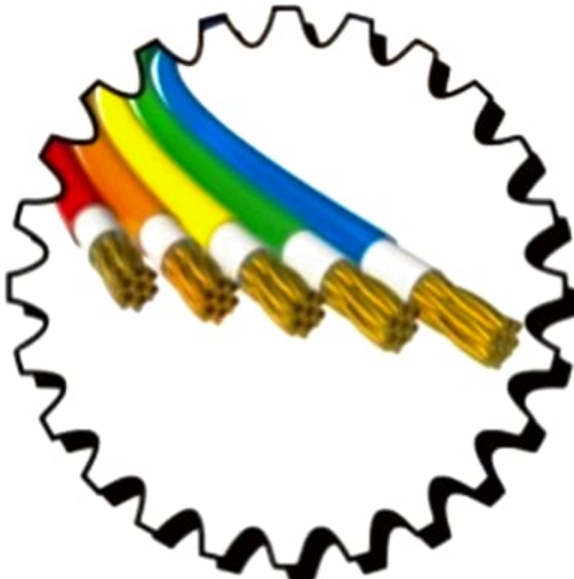
**The following points should be kept in view during installation and testing of cables :**

1. Before laying, the insulation of the cable should be checked with megger as a preliminary check against any transit damage.
2. The drum should be always rolled in the direction of arrow for rolling, marked on the drum. In the absence of any such mark, the drum should be rolled in the direction same as that of inside end of the cable and opposite to that of the outside end.
3. Where the cable is to be joined with existing cable, the sequence of cores at the two ends to be joined should be in the opposite direction i.e. if at one end it is in clockwise direction, at the other end it should be in anti clockwise direction. This is necessary to avoid the crossing of cores while jointing. This will also decide the direction in which the cable is to be pulled.
4. During installation of XLPE / PVC insulated heavy duty cables of 1100V grade, bending radius should not be less than the following :
  - i) Single core cables : 15 times the overall diameter of cables.
  - ii) Multicore cables : 12 times the overall diameter of cables.
5. Where the cables are laid and jointed in very cold regions, both the cable and the ambient temperatures should be above 0°C and have remained so far the previous 24 hours. During such conditions, the cable should also not be bend to very small radius, This is for the reason that at very low temperatures PVC compounds become stiff and brittle, and are likely to crack and shatter when struck hard or bent to small radius.
6. A joint being the weakest point of electric power transmission system, all jointing materials and accessories like conductor ferrules, solder, insulating and protective tapes, protective filling compound, joint boxes etc., should be of right quality and sizes. A skilled jointer should be employed for making a joint and the working instructions of the supplier should be followed.
7. Armoured Cables : All bonding clamps at the joints and terminations and the armour wires should be thoroughly cleaned. The clamps should be adequately tightened. This is necessary to ensure proper electrical contact, because armour acts as the return path for Earth fault current.  
Unarmoured Cables : In case of unarmoured cables, the external metallic Earth bonding connector of adequate size should be used.
8. Earth : All joints, terminations, armour wires and external metallic bonding should be connected to Earth. Where ever possible armour at one end of the cable should be connected to main Earth system at the supplying end by employing metallic conductors.
9. Filling Compounds :
  - a) The design of the box and the composition of the filling compound should provide an effective sealing against entry of moisture to conductor ferrules and armour connectors.
  - b) If hot pouring protective compounds are used the temperature of the compound while pouring should not exceed 150°C
10. Test before commissioning of a cable: After the cable is laid but before it is put into service a Da voltage of 3 KV between phases and Earth be applied the voltage should be increased gradually full value and maintained continuously for 15 minutes. No breakdown in the run of cables the joint should occur during the test.

### CONVERSION TABLE

Particulars	Multiplier Constant	Reciprocal of Constant
Miles to Millimeters (1000 Miles 1 inch)	0.0254	39.37
Inches to Centimetres	2.54	0.3937
Yards to Metres	0.9144	1.0936
Miles to Kilometres	1.6039	0.6214
Sq. Inches to Sq. Millimetres	645.16	0.00155
Circ. Miles to Sq. Millimetres	506.7 x 10 <sup>-6</sup>	1937.5
Circ. Miles to Sq. Inches	0.7854 x 10 <sup>-6</sup>	1.273x10 <sup>6</sup>
Sq. Yards to Sq. Metres	0.08361	1.196
Pounds to Kilogrammes	0.4536	2.2910
Tons (2240 lbs.) to Kilogrammes	1016.02	0.00098
Cwt. To Kilogrammes	50.8	0.01968
Ounces (Avolr) to Grammes	28.35	0.0353
Gallons (Imp.) to Litres	4.546	0.22
Gallons (Imp.) to Cubic Inches	277.42	0.003604
lbs./1000 Yards to lbs./Mile	1.76	0.568
lbs./1000 Yards to-gm./Km.	0.4961	2.016
lbs./Sq. Inch to-gm./mm <sup>2</sup>	703 x 10 <sup>6</sup>	1422.33
Ohms/1000 Yards to Ohms/Mile	1.76	0.568
Ohms/1000 Yards to Ohms/Km	1.0936	0.9144
Horse Power to Ft. Lb./Min...	33000	30.10 <sup>6</sup>
Horse Power to Ft. Kilowatts..	0.746	1.34
Horse Power to Kg.m./Sec..	76.0	0.01316
Watts Ft. lb./Min.	44.24	0.022
Wats to Kg.m./Sec.	0.1	10.0
Miles/Hour to Ft./Min.	88.0	0.07734
Meters/Sec. To Ft./Min.	197.0	0.00508
Land Miles to Nautical Miles	0.868	1.151

Temperature : °F to °C Subtract 32 and Multiply by 5/9; °C to °F: Multiply by 9/5 and add 32.





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