

# Control & Power Cables



**EMINENT™**  
WIRES AND CABLES

**Magnitech**  
MAGNI TECH SPECIALITY CABLES PVT. LTD.

# Magnitech



## Introduction:

Magni tech speciality cables pvt. Ltd. is one of the leading manufacturers of cable & wires in India. The company has invested heavily in the manufacturing infrastructure and is using state of the art technology to produce the best quality wire & cables to ensure high productivity and enhanced process control. The company produces various types of cables using the most modern technology, high - tech equipments and best raw materials. A team of skilled and experienced professionals are dedicated for continuous research to keep in pace with the ever advancing technology. Our products are highly functional and innovative, designed with respect to on site working conditions, fire resistance and environmental factors. Our conductors are manufactured in geometrical formation to ensure stable and uniform shape, resulting into uniform insulation. This elements possibility of current leakage even after ageing. Our equipment has one line quality check/ correction that ensure 100 % faultless output, consistent quality and repeatable test results. It also ensures optimum conductivity of the conductor and stress - free insulation. Our insulating and sheathing compound are specially formulated to give glossy surface to have optimum life of the plastic and avoid brittleness after ageing. Our cables are designed to suit the application and customer equipment on safety, savings and performance, as our products are manufactured meeting the requirement meeting the requirement of international Standard IEC 60228. Since our company complies ISO 9001 standard it becomes imperative to ensure the best quality products to our customers within the country and in global market. We are continuously working towards making our customers delighted with our services and product quality.

## Achievement:

We have manufacture of all types of low voltage 600/1100V Control cable & Power Cables PVC/XLPE insulation. We have manufacturing capacity to produce Multicore cable up to 630 sq. mm & Single core up to 1000 sq mm.

We introduce ourselves as an established manufacturer of Specialty Cables required in the field of Communication, Data Transmission Instrumentation and power transmission. Our focused interest is towards producing high-quality products that are value for your money.

- ◆ We have design capability to manufacture cable suiting to the application and customer requirement.
- ◆ Our equipment is capable of producing cables meeting national and international standards.
- ◆ We have been certified for ISO 9001:2000 for Design and manufacture of "Copper Communication Cables and Power Distribution Cables"
- ◆ Certified for CE marking.

## Product Profile

- ◆ House wire
- ◆ Indoor telephone cable
- ◆ CCTV & Security System Cables .
- ◆ Solar Cables( Photovoltaic cables)
- ◆ Multicore & twisted pair screened cables for signaling, instrumentation, data communication etc
- ◆ Multi core & single core copper flexible cables including cables for submersible pumps.
- ◆ Company can offer cables with HFFR/FRLS/FR/HR 85 and 105 deg.C/PE, PU, TPR, TPE insulation / sheath.
- ◆ Auto cable and battery cable as per JIS,DIN and IS.
- ◆ LT Power and control cables
- ◆ Power transmission conductors

# Magnitech

**TYPICAL EXAMPLES OF DESIGN & CONSTRUCTION AS PER IS 1554**

Power Cable  
Steel strip, armoured



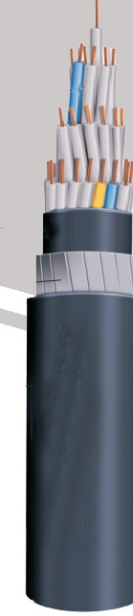
**Conductor :**  
EC Grade  
Aluminium  
**Insulation**  
PVC type  
A or C  
**Inner Sheath :**  
PVC type  
ST1 or ST2  
**Armour :**  
Galvanised  
Steel strip  
**Outer Sheath :**  
PVC type  
ST1 or ST2  
For dimensional  
details please  
see Tables I to V

IS Specification

**8130**  
**5831**  
**5831**  
**3975**  
**5831**

**Conductor :**  
High conductivity, Electrolytic  
Grade Copper  
**Conductor :**  
High conductivity, Electrolytic  
Grade Copper  
**Inner Sheath :**  
PVC type  
ST1 or ST2  
**Armour :**  
Galvanised  
Steel strip  
**Outer Sheath :**  
PVC type  
ST1 or ST2  
For dimensional  
details please  
see Tables VII to  
VIII

Control Cable  
Steel strip, armoured



**CLASSIFICATION OF PVC COMPOUND**

Type	Application	Max. Conductor Temperature
A	Insulation	70°C
ST1	Sheath	70°C
ST2	Sheath	90°C
C	Insulation	85°C

**CORE IDENTIFICATION**

For Power cables and Control cables upto 5 cores, the cores are identified by different colours as per IS 1554 :

Single core : Red, Black, Yellow or Blue  
2 core : Red and Black  
3 core : Red, Yellow and Blue  
3 ½ core : Red, Yellow, Blue, and reduced neutral core in Black  
4 core : Red, Yellow, Blue and Black  
5 core : Red, Yellow, Blue, Black and Grey

Where the number of cores exceed 5, two adjacent cores are blue for reference and yellow for direction in each layer. The remaining cores in each layer are grey.

On specific request we can also provide core numbering for Control cables.

**PRODUCT CODE**

As per IS 1554 / Part - I / 1988, the product is coded by alphabets :

Aluminium Conductor (No abbreviations are used for copper.) 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  
Al wire armour AW

This product code is stenciled on the surface of the drum flange.

Note : Conductor construction classified as:

r<sub>e</sub> : single strand  
r<sub>m</sub> : multi-stranded circular  
s<sub>m</sub> : sector shaped

Note: The entire range of Power and Control cables can be supplied with Flame Retardant Low Smoke (FRLS) sheathing. These cables are also manufactured as per International Standards viz. BS 6346, IEC 60502, etc.

**EMINENT™**  
WIRES AND CABLES



## CURRENT RATINGS

The current ratings given in Tables I to VIII are based on normal conditions of installation described below :

- |  |   |
|--|---|
| 1. Maximum Conductor Temperature   | 70°C for GPPVC Insulation & 85°C for HRPVC Insulation |
| 2. Thermal Resistivity of Soil   | 150°C cm/W  |
| 3. Thermal Resistivity of PVC  | 650°C cm/ W   |
| 4. Ground Temperature  | 30°C  |
| 5. Ambient air temperature   | 40°C  |
| 6. Depth of laying (to the highest point of cable laid direct in the ground) | 75 cms  |

Cables shall only be operated at their full rating if the minimum current at which circuit protection is designed to operate does not exceed 1.5 times (in the case of cables in air or in ducts) or 1.3 times (in the case of cables laid direct in the ground) the values tabulated, in tables I to VIII.

Note :

For cables in air, no reduction in current rating is necessary provided that

- The horizontal clearance between circuits is: (a) not less than six times the overall diameter of an individual cable, and (b) not less than the overall width of an individual circuit, except that the horizontal clearance need not in any case exceed 150 mm.
- The vertical clearance between circuits is not less than 150 mm.
- If the number of circuits exceeds 4, they are installed in a horizontal plane.

However, for installation conditions other than above, current rating factors incorporated in IS 3961 Part II may please be applied.

The following points should be taken into consideration before selecting any particular size & type of cable:

- The system of power & voltage source where the cables are being used.
- Conditions of installation at site.
- Current carrying capacity of cable.
- Voltage drop of the cable.
- Short circuit capacity of cable.
- Availability of the selected size of cable.

### Short Circuit Rating in kA for One Second duration

Area of Conductor Sq. mm	Aluminium Conductor		Copper Conductor	
	PVC	HRPVC	PVC	HRPVC
1.5	0.1126	0.097	0.169	0.153
2.5	0.1878	0.162	0.283	0.255
4.0	0.3004	0.259	0.452	0.406
6.0	0.4507	.389	0.679	0.612
10.0	0.7512	.648	1.132	1.020
16.0	1.200	1.087	1.810	1.632
25.0	1.870	1.620	2.830	2.550
35.0	2.620	2.270	3.960	3.570
50.0	3.750	3.243	5.660	5.100
70.0	5.250	4.540	7.920	7.140
95.0	7.130	6.150	10.750	9.690
120.0	9.000	7.784	13.580	13.340
150.0	11.260	9.730	16.980	15.300
185.0	13.890	12.000	20.940	18.870
240.0	18.020	15.560	27.160	24.480
300.0	22.530	19.460	33.960	30.600
400.0	30.040	25.940	45.280	40.800
500.0	37.560	32.430	56.600	51.000
630.0	47.320	40.860	71.310	64.250

#### Formula for calculating the Short Circuit for other durations

$$I_t = \frac{I_1}{\sqrt{t}}$$

Where.....

$I_1$  = Short Circuit Current for one second.

$I_t$  = Short Circuit Current for t seconds.

t = Duration in seconds.

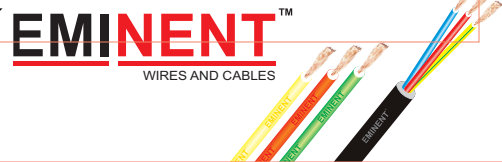
Maximum Conductor temperature during Short Circuit is 160°C for both PVC and HRPVC Cables.

**TABLE 1 : SINGLE CORE PVC INSULATED ARMORED & UNARMORED CABLE WITH ALUMINIUM/ COPPER CONDUCTOR (AS-IS:1554(1))**

Area mm <sup>2</sup>	Cond. Min. No. of wires		Thickness Insulation		Inner Thick-ness		Dimension of Armour Wire/Strip		Outer Thickness		Approx. O.D.		Approx. Net Wt. of Cable		Max. D.C. resistance at 20°C		Approx. A.C. resistance at 70°C		Approx. capacitance/phase		Current Rating				Short Circuit rating for 1 sec.			
	Al	Cu	Un-Arm	Mm	Un-Arm	Mm	Al/Cu	Al/Cu	Al/Cu	Al/Cu	Un-Arm	mm	Al	Cu	Al	Cu	Al	Cu	Al	Cu	Un-Arm	µf/km	In Duct	In air	Al	Cu	Al	Cu
4	1.0	1.0	1.3	1.0	NA	1.4	1.24	1.8	10.7	8.3	139	165	82	103	4.61	7.41	8.9	5.52	-	0.57	31	39	30	38	27	35	0.304	0.46
6	1.0	1.0	1.3	1.0	NA	1.4	1.24	1.8	11.6	9.2	168	205	102	139	4.61	4.61	5.54	3.69	-	0.67	39	49	37	48	35	44	0.456	0.69
10	1.0	1.0	1.3	1.0	NA	1.4	1.24	1.8	12.5	10.1	198	260	124	186	3.08	3.08	3.70	2.19	0.67	0.83	51	65	51	64	47	60	0.760	1.15
16	1.0	1.0	1.3	1.0	NA	1.4	1.24	1.8	13.2	10.8	225	322	149	246	1.91	1.91	2.30	1.38	0.8	0.97	66	85	65	83	64	82	1.220	1.84
25	1.0	1.0	1.5	1.2	NA	1.4	1.24	1.8	14.8	12.4	292	443	200	351	1.20	1.20	1.44	0.87	0.83	1.0	86	110	84	110	84	110	1.900	2.88
35	1.0	1.0	1.5	1.2	NA	1.4	1.24	1.8	15.8	13.4	340	566	239	455	0.868	0.868	1.04	0.627	0.95	1.15	100	130	100	125	105	130	2.66	4.03
50	1.0	1.0	1.7	1.4	NA	1.4	1.24	1.8	17.6	15.2	421	706	305	590	0.641	0.641	0.77	0.463	0.95	1.26	120	155	115	150	130	165	3.8	5.75
70	1.0	1.0	1.7	1.4	NA	1.4	1.4	1.8	19.6	16.8	529	959	385	815	0.443	0.443	0.532	0.321	1.12	1.32	140	190	135	175	155	205	5.32	8.05
95	1.0	1.0	1.9	1.6	NA	1.4	1.4	1.8	20.9	18.9	637	1217	497	1077	0.32	0.32	0.385	0.231	1.17	1.36	175	220	155	200	190	245	7.22	10.9
120	1.0	1.0	1.9	1.6	NA	1.4	1.4	2.0	22.4	20.8	738	1467	606	1335	0.253	0.253	0.305	0.184	1.28	1.49	195	250	170	220	220	280	9.12	13.8
150	1.0	1.0	2.1	1.8	NA	1.4	1.4	2.0	24.3	22.7	877	1799	724	1646	0.206	0.206	0.249	0.149	1.32	1.52	220	280	190	245	250	320	11.4	17.3
185	1.0	1.0	2.3	2.0	NA	1.4	1.4	2.0	26.4	24.8	1038	2166	876	2004	0.164	0.164	0.199	0.120	1.3	1.47	240	305	210	260	290	370	14.1	21.3
240	1.0	1.0	2.5	2.2	NA	1.4	1.4	2.0	29.1	27.4	1292	2713	1093	2514	0.125	0.125	0.152	0.0912	1.37	1.54	270	345	225	285	335	425	18.2	27.6
300	1.0	1.0	2.7	2.4	NA	1.4	1.4	2.0	32.1	30.0	1560	3381	1322	3143	0.100	0.100	0.123	0.0739	1.4	1.60	295	375	245	310	380	475	22.8	34.5
400	1.0	1.0	3	2.6	NA	1.4	1.4	2.0	36.2	34.2	1935	4388	1686	4139	0.0778	0.0778	0.0975	0.0592	1.5	1.70	325	400	275	335	435	550	30.4	46.0
500	1.0	1.0	3.4	3.0	NA	1.4	1.4	2.0	39.6	37.8	2390	5444	2109	5163	0.0665	0.0665	0.0767	0.0468	1.46	1.63	345	425	295	355	480	590	38.0	57.7
630	1.0	1.0	3.9	3.4	NA	1.4	1.4	2.0	44.7	42.7	3052	6857	2696	6501	0.0469	0.0469	0.0514	0.0379	1.45	1.64	390	470	320	375	550	660	47.9	72.5
800	1.0	1.0	3.9	3.4	NA	1.4	1.4	2.0	49.4	47.1	3699	8352	3287	7940	0.0367	0.0367	0.0510	0.0314	1.65	1.87	440	530	345	405	600	725	60.8	92.0
1000	1.0	1.0	3.9	3.4	NA	1.4	1.4	2.0	53.7	51.5	4466	10521	4010	10065	0.0291	0.0291	0.0420	0.0271	1.76	2.05	490	590	370	435	720	870	76.0	115.0

**TABLE 2 : 2 CORE PVC INSULATED ARMORED & UNARMORED CABLE WITH ALUMINIUM/ COPPER CONDUCTOR (AS-IS:1554(1))**

Area mm <sup>2</sup>	Cond. Min. No. of wires		Insulation Thick-ness		Inner Thick-ness		Dimension of Armour Wire Strip		Outer Thickness		Approx. O.D.		Approx. Net Wt Of Cable		Max. D.C. resistance at 20°C		Approx. A.C. resistance at operating temp. 70°C		Approx. capacitance/phase		Current Rating				Short Circuit rating for 1 sec.		
	Al	Cu	Al/Cu	Mm	Al/Cu	Mm	Al/Cu	Al/Cu	Al/Cu	Al/Cu	Un-Arm	mm	Al	Cu	Al	Cu	Al	Cu	Al	Cu	Un-Arm	µf/km	In Duct	In air	Al	Cu	Al
2.5	1.0	1.0	0.9	0.3	1.4	1.24	1.8	14.8	13.0	436	477	199	230	12.1	7.41	14.5	8.87	0.13	0.13	25	32	21	27	21	27	0.19	0.288
4	1.0	1.0	1.0	0.3	1.4	1.24	1.8	16.1	14.3	502	554	242	294	7.41	4.61	8.9	5.52	0.14	0.14	32	41	27	35	27	35	0.304	0.46
6	1.0	1.0	1.0	0.3	1.4	1.24	1.8	18.1	16.3	633	707	316	390	4.61	3.08	5.54	3.69	0.16	0.16	40	50	34	44	35	45	0.456	0.69
10	1.0	1.0	1.0	0.3	1.4	1.24	1.8	19.5	17.7	734	868	384	508	3.08	1.83	3.70	2.19	0.18	0.18	55	70	45	58	47	60	0.760	1.15



16	7.0	7.0	1.0	0.3	4 x 0.8	1.4	1.8	17.5	16.4	533	729	325	521	1.91	1.15	2.30	1.38	0.19	0.19	70	90	58	75	59	78	1.22	1.84
25	7.0	7.0	1.2	0.3	4 x 0.8	1.4	2.0	20.1	19.4	687	991	453	757	1.20	0.727	1.44	0.87	0.22	0.22	90	115	76	97	78	105	1.90	2.88
35	7.0	7.0	1.2	0.3	4 x 0.8	1.4	2.0	21.5	20.8	796	1226	538	972	0.868	0.524	1.04	0.627	0.24	0.24	110	140	92	120	99	125	2.66	4.03
50	7.0	7.0	1.4	0.3	4 x 0.8	1.4	2.0	24.1	23.4	976	1549	676	1249	0.641	0.387	0.77	0.463	0.24	0.24	135	165	115	145	125	155	3.80	5.75
Ø	19	19	1.4	0.3	4 x 0.8	1.56	2.0	26.7	25.6	1207	2072	842	1707	0.443	0.268	0.532	0.321	0.26	0.26	160	205	140	180	150	195	5.32	8.05
95	19	19	1.6	0.4	4 x 0.8	1.56	2.2	30.1	29.4	1501	2688	1122	2289	0.32	0.193	0.384	0.231	0.26	0.26	190	240	170	215	185	230	7.22	10.09
120	19	19	1.6	0.4	4 x 0.8	1.56	2.2	32.1	31.4	1743	3209	1309	2775	0.253	0.153	0.304	0.184	0.28	0.28	210	275	190	235	210	265	9.12	13.8
150	19	19	1.8	0.4	4 x 0.8	1.72	2.4	34.7	34	2053	3906	1577	3430	0.206	0.124	0.248	0.149	0.28	0.28	240	310	210	270	240	305	11.4	17.3
83	37	37	2.0	0.5	4 x 0.8	1.88	2.4	38	37	2461	4744	1914	4197	0.164	0.0991	0.198	0.120	0.28	0.28	275	350	240	300	275	350	14.1	21.3
240	37	37	2.2	0.5	4 x 0.8	2.04	2.6	43	42	3034	5891	2425	5282	0.125	0.0754	0.152	0.0912	0.28	0.28	320	405	275	345	325	410	18.2	27.6
300	37	37	2.4	0.6	4 x 0.8	2.20	2.8	46.5	45.6	3636	7297	2964	6625	0.100	0.0601	0.122	0.0739	0.29	0.29	355	430	305	385	365	465	22.8	34.5
400	61	61	2.6	0.7	4 x 0.8	2.36	3.2	52.3	51.8	4495	9461	3762	8748	0.0778	0.0470	0.096	0.0592	0.29	0.29	385	490	345	425	420	530	30.4	46.0
500	61	61	3.0	0.7	4 x 0.8	2.84	3.4	58.7	57.6	5419	9558	4732	8871	0.0605	0.0366	0.076	0.0468	0.29	0.29	415	520	365	460	455	575	38.0	57.5
630	61	61	3.4	0.7	4 x 0.8	2.84	3.8	64.8	64.4	6875	12247	6012	11384	0.0469	0.0283	0.061	0.0379	0.29	0.29	460	565	405	510	520	655	47.9	72.5

**TABLE 3 : 3 CORE PVC INSULATED ARMoured & UNARMoured CABLE WITH ALUMINIUM/ COPPER CONDUCTOR (AS-IS:1554(1))**

Area	Cond. Min. No. of wires	Insulation Thickness	Inner Thickness	Dimension of Armour Wire Strip	Outlets Thickness		Approx.O.D.		Approx. Net.Wt. Of Cable		Max. D.C. resistance at 20°C	Approx. A.C. resistance at operating temp.70°C		Approx. capacitance/phase		Current Rating				Short Circuit rating for 1 sec.						
					Arm	Un-Arm	Arm	Un-Arm	Arm	Un-Arm		Arm	Un-Arm	Arm	Un-Arm	Arm	Un-Arm	In Duct	In air	KA	(rms)					
mm²	No.	mm	mm	mm	mm	mm	mm	mm	Kg/km	Kg/km	Ohm/km	Ohm/km	Ohm/km	µf/ km	µf/ km	Amps	Amps	Amps	Amps	Amps	KA	(rms)				
Al/Cu	Al	Al/Cu	Al/Cu	Al/Cu	Al/Cu	Al/Cu	Al/Cu	Al	Al	Al	Al	Al	Al	Al/Cu	Al/Cu	Al	Cu	Al	Al	Al	Al	Cu				
2.5	1.0	0.9	0.3	1.4	1.24	1.8	15.5	13.7	469	521	12.1	7.41	14.5	8.87	0.355	21	27	18	24	18	24	0.19	0.288			
4	1.0	1.0	0.3	1.4	1.24	1.8	16.8	15.0	555	663	7.41	4.61	8.9	5.52	0.395	28	36	23	30	23	30	0.304	0.46			
6	1.0	1.0	0.3	1.4	1.24	1.8	19	17.2	694	806	4.61	3.08	5.54	3.69	0.435	35	45	30	38	30	38	0.456	0.69			
10	1.0	1.0	0.3	1.4	1.24	1.8	21.0	18.9	827	1014	3.08	1.83	3.70	2.19	0.495	46	60	39	50	40	52	0.760	1.15			
16	7.0	1.0	0.3	4 x 0.8	1.4	1.8	20.2	19.1	679	972	432	725	1.91	1.15	2.30	1.38	0.56	0.56	60	77	50	64	51	66	1.22	1.84
25	7.0	1.2	0.3	4 x 0.8	1.4	2.0	22.5	21.5	868	1324	597	1053	1.20	0.727	1.44	0.87	0.62	0.62	76	99	63	81	70	90	1.90	2.88
35	7.0	1.2	0.3	4 x 0.8	1.4	2.0	24.2	23.5	1009	1661	719	1371	0.868	0.524	1.04	0.627	0.66	0.66	92	120	77	99	86	110	2.66	4.03
50	7.0	1.4	0.3	4 x 0.8	1.56	2.0	27.6	26.5	1292	2151	914	1773	0.641	0.387	0.77	0.463	0.7	0.7	110	145	95	125	105	135	3.80	5.75
70	19	1.4	0.4	4 x 0.8	1.56	2.2	30.9	30.0	1593	2889	1200	2406	0.443	0.268	0.532	0.321	0.73	0.73	135	175	115	150	130	165	5.32	8.05
95	19	1.6	0.4	4 x 0.8	1.56	2.2	34.1	33.2	1974	3723	1542	3291	0.32	0.193	0.385	0.231	0.76	0.76	165	210	140	175	155	200	7.22	10.09
120	19	1.6	0.4	4 x 0.8	1.72	2.2	37.3	36.2	2352	2750	1821	4019	0.253	0.153	0.305	0.184	0.78	0.78	185	240	155	195	180	230	11.4	13.8
150	19	1.8	0.5	4 x 0.8	1.88	2.4	41.0	40.0	2791	5571	2229	5009	0.206	0.124	0.249	0.149	0.795	0.795	210	270	175	225	205	265	9.12	17.3
185	37	2.0	0.5	4 x 0.8	1.88	2.6	44.9	44.3	3306	6732	2740	6166	0.164	0.0991	0.198	0.120	0.81	0.81	235	300	200	255	240	305	14.1	21.3
240	37	2.2	0.6	4 x 0.8	2.20	2.8	50.7	49.8	4193	8477	3496	7780	0.125	0.0754	0.152	0.0912	0.82	0.82	275	345	235	295	280	355	18.2	27.6
300	37	2.4	0.6	4 x 0.8	2.36	3.0	56.0	55.1	5025	10516	4288	9759	0.100	0.0601	0.123	0.0739	0.825	0.825	305	385	260	335	315	400	22.8	34.5
400	61	2.6	0.7	4 x 0.8	2.52	3.4	62.7	62.0	6255	13652	5429	12826	0.0778	0.0470	0.0975	0.0592	0.83	0.83	335	425	290	360	375	455	30.4	46.0
500	61	3.0	0.7	4 x 0.8	2.84	3.6	70.1	69.3	7774	17048	6827	16101	0.0605	0.0366	0.0767	0.0468	1.1	1.1	355	440	315	390	405	500	38.0	57.5

**TABLE 4 : 3.5 CORE PVC INSULATED ARMoured & UNARMoured CABLE WITH ALUMINIUM/ COPPER CONDUCTOR (AS-IS:1554 (1))**

Area mm <sup>2</sup>	Cond. Min. No. of wires		Insulation Thickness mm	Inner Thick-ness mm	Dimension of Armour Wire Strip Mm	Outer Thickness mm		Approx O.D. mm		Approx. Net Wt. Of Cable Kg/km		Max. D.C. resistance at 20°C Ohm/km	Approx A. C. resistance at operating temp/°C Ohm/km		Approx capacitance/Phase µf/km	Current Rating Amps			Short Circuit rating for 1sec. KA (rms)					
	Al	Cu				Un-Arm	Arm	Un-Arm	Arm	Al	Cu		Al	Cu		Al	Cu	Al		Cu	Al	Cu	Al	Cu
25	7	7.0	1.2/1.0	0.3	4 x 0.8	1.4	2.0	23.4	983	1536	692	1.2	0.873	0.86	0.86	76	99	63	81	70	90	1.90	2.88	
35	7	7.0	1.2/1.0	0.3	4 x 0.8	1.4	2.0	26.1	1150	1900	818	0.868	0.629	0.98	0.98	92	120	77	99	86	110	2.66	4.03	
50	7	7.0	1.4/1.2	0.3	4 x 0.8	1.56	2.0	29.4	1451	2463	1051	0.641	0.387	0.77	0.465	1	110	145	95	125	105	135	3.80	5.75
70	19	19	1.4/1.2	0.4	4 x 0.8	1.56	2.2	33	1784	3298	1372	0.443	0.268	0.52	0.322	1.16	135	175	115	150	130	165	5.32	8.05
95	19	19	1.6/1.4	0.4	4 x 0.8	1.56	2.2	37	2273	4313	1782	0.320	0.193	0.385	0.233	1.18	163	210	140	175	155	200	7.22	10.09
120	19	19	1.6/1.4	0.5	4 x 0.8	1.72	2.4	40.5	2720	5350	2187	0.253	0.153	0.305	0.185	1.31	185	240	155	195	180	230	9.12	13.8
150	19	19	1.8/1.4	0.5	4 x 0.8	1.88	2.4	44.3	3175	6387	2549	0.206	0.124	0.249	0.15	1.28	210	270	175	225	205	265	11.4	17.3
185	37	37	2.0/1.6	0.5	4 x 0.8	2.04	2.6	48.9	3855	7869	3166	0.164	0.0991	0.198	0.121	1.3	235	300	200	255	240	305	14.1	21.3
240	37	37	2.2/1.6	0.6	4 x 0.8	2.20	3.0	55	4845	9862	4069	0.125	0.0754	0.152	0.094	1.34	275	345	235	295	280	355	18.2	27.6
300	37	37	2.4/1.8	0.6	4 x 0.8	2.36	3.2	60.6	5743	12160	4952	0.100	0.0601	0.123	0.075	1.37	305	385	260	335	315	400	22.8	34.5
400	61	61	2.6/2.0	0.7	4 x 0.8	2.68	3.4	69.1	7042	15635	6242	0.0778	0.0470	0.0975	0.061	1.43	335	425	290	360	375	455	30.4	46.0
500	61	61	3.0/2.2	0.7	4 x 0.8	2.84	3.8	76.9	8920	19633	7968	0.0605	0.0366	0.0767	0.049	1.41	355	440	315	390	405	500	38.0	57.50





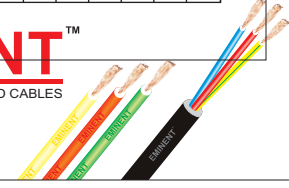


**TABLE 6 : PVC INSULATED ARMoured & UNARMoured CONTROL CABLE WITH COPPER CONDUCTOR. (AS-IS:1554(1))**

No. of Cores x Area	Cond. Min. No. of wires	Insulation Thickness	Thickness of inner sheath	Dimension of Armour Wire Strip	Outer Thickness		Approx O.D.		Approx. Net Wt. of Cable		Max. D.C. resistance at 20°C	Approx. A.C. resistance at operating temp. 70°C	Approx capacitance per phase	Current Rating			Short Circuit rating for 1 sec.
					Arm	Un-Arm	Arm	Un-Arm	mm	Mm				mm	mm	Arm	
2x1.5	1.0	0.8	0.3	1.4	1.24	1.8	13.6	11.7	411	183	12.1	14.5	0.1	23	20	20	0.173
3x1.5	1.0	0.8	0.3	1.4	1.24	1.8	14.1	12.3	450	212	12.1	14.5	0.1	21	17	17	0.173
4x1.5	1.0	0.8	0.3	1.4	1.24	1.8	14.9	13.1	508	247	12.1	14.5	0.1	21	17	17	0.173
5x1.5	1.0	0.8	0.3	1.4	1.24	1.8	16.1	14.3	542	278	12.1	14.5	0.1	21	17	17	0.173
6x1.5	1.0	0.8	0.3	1.4	1.24	1.8	17.1	15.3	607	322	12.1	14.5	0.1	15	13	13	0.173
7x1.5	1.0	0.8	0.3	1.4	1.24	1.8	17.1	15.3	621	332	12.1	14.5	0.1	14	13	13	0.173
10x1.5	1.0	0.8	0.3	1.4	1.40	1.8	20.8	18.6	838	456	12.1	14.5	0.1	13	11	11	0.173
12x1.5	1.0	0.8	0.3	4 x 0.8	1.24	1.8	19.8	19.2	723	501	12.1	14.5	0.1	12	10	10	0.173
14x1.5	1.0	0.8	0.3	4 x 0.8	1.40	1.8	21.0	20.0	822	568	12.1	14.5	0.1	11	10	10	0.173
16x1.5	1.0	0.8	0.3	4 x 0.8	1.40	1.8	22.0	21.0	912	628	12.1	14.5	0.1	11	9	9	0.173
19x1.5	1.0	0.8	0.3	4 x 0.8	1.40	2.0	23.2	22.4	987	724	12.1	14.5	0.1	10	9	9	0.173
24x1.5	1.0	0.8	0.3	4 x 0.8	1.40	2.0	26.4	25.8	1225	900	12.1	14.5	0.1	9	8	8	0.173
27x1.5	1.0	0.8	0.3	4 x 0.8	1.40	2.0	26.9	26.2	1291	968	12.1	14.5	0.1	9	8	8	0.173
30x1.5	1.0	0.8	0.3	4 x 0.8	1.40	2.0	27.8	27.2	1396	1051	12.1	14.5	0.1	9	7	7	0.173
37x1.5	1.0	0.8	0.3	4 x 0.8	1.40	2.0	29.7	29.1	1608	1243	12.1	14.5	0.1	8	7	7	0.173
44x1.5	1.0	0.8	0.3	4 x 0.8	1.56	2.0	33.4	32.3	1925	1468	12.1	14.5	0.1	7	6	6	0.173
52x1.5	1.0	0.8	0.4	4 x 0.8	1.56	2.0	35.0	34.0	2173	1698	12.1	14.5	0.1	7	6	6	0.173
61x1.5	1.0	0.8	0.4	4 x 0.8	1.56	2.2	36.9	36.3	2445	1959	12.1	14.5	0.1	6	6	6	0.173
2x2.5	1.0	0.9	0.3	1.4	1.24	1.8	15.0	12.8	477	230	7.41	8.87	0.1	32	27	27	0.288
3x2.5	1.0	0.9	0.3	1.4	1.24	1.8	15.5	13.7	521	282	7.41	8.87	0.1	27	24	24	0.288
4x2.5	1.0	0.9	0.3	1.4	1.24	1.8	16.5	14.7	614	335	7.41	8.87	0.1	27	24	24	0.288
5x2.5	1.0	0.9	0.3	1.4	1.24	1.8	18.0	16.0	674	366	7.41	8.87	0.1	27	24	24	0.288
6x2.5	1.0	0.9	0.3	1.4	1.24	1.8	19.0	17.0	757	426	7.41	8.87	0.1	21	18	18	0.288
7x2.5	1.0	0.9	0.3	1.4	1.24	1.8	19.0	17.0	776	451	7.41	8.87	0.1	20	17	17	0.288
10x2.5	1.0	0.9	0.3	4 x 0.8	1.40	1.8	23.8	21.1	908	622	7.41	8.87	0.1	18	15	15	0.288
12x2.5	1.0	0.9	0.3	4 x 0.8	1.40	2	22.8	20.3	972	708	7.41	8.87	0.1	17	14	14	0.288
14x2.5	1.0	0.9	0.3	4 x 0.8	1.40	2	23.9	23.2	1079	795	7.41	8.87	0.1	16	13	13	0.288
16x2.5	1.0	0.9	0.3	4 x 0.8	1.40	2	25.0	24.4	1197	892	7.41	8.87	0.1	15	12	12	0.288
19x2.5	1.0	0.9	0.3	4 x 0.8	1.40	2	26.3	25.7	1336	1010	7.41	8.87	0.1	14	12	12	0.288
24x2.5	1.0	0.9	0.3	4 x 0.8	1.40	2	30.3	29.7	1651	1264	7.41	8.87	0.1	13	11	11	0.288
27x2.5	1.0	0.9	0.3	4 x 0.8	1.40	2	30.9	30.3	1750	1366	7.41	8.87	0.1	12	10	10	0.288
30x2.5	1.0	0.9	0.3	4 x 0.8	1.56	2	32.3	31.3	1923	1487	7.41	8.87	0.1	12	10	10	0.288
37x2.5	1.0	0.9	0.4	4 x 0.8	1.56	2.2	34.9	34.2	2269	1826	7.41	8.87	0.1	11	9	9	0.288
44x2.5	1.0	0.9	0.4	4 x 0.8	1.56	2.2	38.9	38.2	2662	2140	7.41	8.87	0.1	10	9	9	0.288
52x2.5	1.0	0.9	0.4	4 x 0.8	1.56	2.2	40.3	39.9	2985	2474	7.41	8.87	0.1	10	8	8	0.288
61x2.5	1.0	0.9	0.4	4 x 0.8	1.56	2.2	42.5	41.9	3385	2821	7.41	8.87	0.1	9	8	8	0.288

**Note:** We also provide control cable with stranded conductor for 1.5mm<sup>2</sup> / 0.53mm and 2.5mm<sup>2</sup> / 0.67mm size of wire is used.

**EMINENT**  
WIRES AND CABLES



## L.V. XLPE INSULATED POWER AND CONTROL CABLES:

### Introduction

XLPE is an abbreviation of Cross Linked Polyethylene. This has been recognized world wide as an excellent dielectric for wires and cables. Polyethylene, which is a thermoplastic material, is converted into a thermosetting material by a process similar to vulcanization of rubber. By cross-linking, the linear chain structure of Polyethylene is changed into 3D network structure. By this change, Polyethylene, which has outstanding dielectric properties, is made resistant to extremes of temperature. The high resistance to heat deformation and ageing in hot air provides an important advantage in cable ratings and is of special significance at locations where the ambient temperature is high. These, along with better resistance to environment stress cracking and low dielectric constant make XLPE cables suitable for all voltage application.

### Advantage of XLPE cables over PVC cable are as under:

#### 1. Excellent Electrical & Physical Properties

High resistance to thermal deformation and the ageing property of XLPE cables provides higher continuous and short circuit current capacity ensuring higher degree of reliability over wide range of temperature variations as compared to PVC cables.

#### Permissible maximum conductor temperature

	XLPE Cable	PVC Cable
Continuous	90	70°C
Short Circuit	250	160°C

#### 1. Higher current carrying capacity

XLPE cable can be used, even one size lower PVC cable for the similar application. Due to higher operating temperature 90°C in case of XLPE than PVC 70°C, current carrying capacity of XLPE cables of the same size is approximately 30% higher than that of PVC.

#### 2. Lower Permittivity

Permittivity of XLPE insulation is 2.3, which is less than that of PVC. Therefore, XLPE cables has lesser charging current than PVC cables.

#### 3. Lower Dielectric Loss

Dielectric loss of XLPE cable is much less and almost constant at all operating temperatures, compared to other types of cables.

#### 4. System Protection

Due to lower Permittivity of XLPE cables, charging current are considerably lower than that of PVC cables, which permits coarse setting of Network Protection System.

#### 5. Emergency Overloading

In case of emergency overloading of cables, XLPE can be overloaded for higher current and for longer duration.

#### 6. Emergency Overloading

In case of emergency overloading of cables, XLPE can be overloaded for higher current and for longer duration.

#### Emergency Overloading

Max. Permissible Temp	Duration of Overloading	
	XLPE	PVC
XLPE 130°C PVC 120°C	Total duration for 100 hours per annum. Operations at the emergency overload temperature of 130°C shall not exceed 100 hours in any 12 consecutive months, not more than 500 hours during the life time of cables.	Total duration for 4 hours in life time.

**7. Heat Resistant**

With cross-linked molecules structure, XLPE cables are excellently ozone resistant and provide outstanding stability as well as resistant to heat.

**8. Mechanical Resistance**

Due to thermosetting process XLPE cable has high mechanical properties as compared to PVC cables.

**9. Environmental & Surrounding Protection**

Excellent mechanical features of XLPE improves the protection against external effects. Resistant to acids & alkalis is excellent.

**10. Rating Features**

XLPE cables carry more current than PVC cables at higher temperatures. Comparative rating factors are given below:

**TABLE- 7 : RATING FACTOR VARIATION IN AMBIENT AIR TEMPERATURE**

Insulating Materials	Continuous Operating Temperature	Temperature			
		40°C	45°C	50°C	55°C
PVC	70°C	1.00	0.90	0.80	0.69
HR-PVC	85°C	1.00	0.94	0.87	0.82
XLPE	90°C	1.00	0.95	0.90	0.84

**11. Cost Saving**

Due to lesser diameter and less weight of XLPE cables laying cost and system supporting accessories cost i.e. cables trays/support is comparatively lower than PVC cables.

**12. Cost Saving**

Due to lesser diameter and less weight of XLPE cables laying cost and system supporting accessories cost i.e. cables trays/support is comparatively lower than PVC cables.

**TABLE-8 : COMPARISON OF A.C CURRENT RATING BETWEEN XLPE & PVC ALUMINIUM CONDUCTOR CABLES**

Normal Cross Section area of Conductor (mm <sup>2</sup> )	3 Single Core Cables				Multi Core Cables			
	In ground (Amps)		In air (Amps)		In ground (Amps)		In air (Amps)	
	XLPE	PVC	XLPE	PVC	XLPE	PVC	XLPE	PVC
25	99	86	115	84	95	76	99	70
35	117	100	140	105	116	92	117	86
50	138	120	170	130	140	110	140	105
70	168	140	210	155	170	135	176	130
95	204	175	255	190	200	165	221	155
120	230	195	300	220	225	185	258	180
150	265	220	342	250	255	210	294	205
185	295	240	385	290	285	235	339	240
240	340	270	450	335	325	275	402	280
300	390	295	519	380	370	305	461	315
400	450	325	605	435	435	335	542	375



**TABLE-9: SINGLE CORE XLPE INSULATED ARMoured & UNARMoured CABLE WITH ALUMINIUM/ COPPER CONDUCTOR.**  
(AS-IS: 7098(1))

Area	Cond. Mm. No. of wires		Insulation Thickness		Inner Thickness	Dimension of Arm Wire Strip	Outer Thickness		Approx. O.D.		Approx. Net Wt. of Cable		Max. D.C. resistance at 20°C		Approx. A.C. resistance at 90°C		Approx. capacitance/phase		Current Rating		Short Circuit rating for 1 sec.						
	mm <sup>2</sup>	No.	Arm	Un-Arm			Arm	Un-Arm	mm	mm	mm	mm	kg/km	kg/km	Ohm/km	Ohm/km	Ohm/km	Ohm/km	µf/km	µf/km		Amps	Amps	KA (rms)			
	Al	Cu	Al/Cu	Al/Cu	Al/Cu	Al	Al/Cu	Al/Cu	Al/Cu	Al	Cu	Al	Cu	Al	Cu	Al	Cu	Al	Cu	Al	Cu	Al	Cu				
1.5	-	1	1	0.7	NA	-	-	1.8	9.5	7.0	-	117	-	65	-	15.5	-	0.19	-	27	-	22	-	0.21			
2.5	-	1	1	0.7	NA	-	-	1.8	10.0	7.5	-	134	-	78	-	9.5	-	0.24	-	36	-	29	-	0.36			
4	1	1	1	0.7	NA	1.4	1.24	1.8	10.5	8.0	131	156	73	97	6.41	4.61	5.9	-	0.29	36	46	32	41	31	40	0.38	0.57
6	1	1	1	0.7	NA	1.4	1.24	1.8	11.0	8.5	152	189	87	124	4.61	3.08	5.9	-	0.34	44	57	40	51	39	51	0.57	0.86
10	1	7	1	0.7	NA	1.4	1.24	1.8	12.0	9.5	176	233	105	167	3.08	1.83	3.94	0.32	0.43	59	76	53	68	53	71	0.94	1.4
16	7	7	1	0.7	NA	1.4	1.24	1.8	12.5	10.5	209	300	134	225	1.91	1.15	2.44	0.38	0.51	76	97	68	87	73	95	1.5	2.3
25	7	7	1.2	0.9	NA	1.4	1.24	1.8	14.5	11.0	287	438	169	320	1.2000	0.7270	1.530	0.380	0.487	96	124	86	112	98	126	2.4	3.6
35	7	7	1.2	0.9	NA	1.4	1.24	1.8	15.5	11.5	331	547	203	419	0.8680	0.5240	1.110	0.671	0.423	114	148	103	133	121	152	3.3	5.0
50	7	7	1.3	1	NA	1.4	1.24	1.8	17.0	13.5	40	691	258	543	0.6410	0.3870	0.818	0.496	0.464	135	174	122	157	150	189	4.7	7.1
70	19	19	1.4	1.1	NA	1.4	1.24	1.8	19.5	15.5	523	953	341	771	0.4430	0.2680	0.565	0.344	0.518	166	213	149	192	187	240	6.6	10.0
95	19	19	1.4	1.1	NA	4 x 1.0	1.4	1.8	20.0	17.0	655	1147	429	1009	0.3200	0.1930	0.409	0.248	0.587	198	256	178	230	230	297	9.0	13.6
120	19	19	1.5	1.2	NA	4 x 1.0	1.4	1.8	22.0	19.0	767	1398	538	1267	0.2530	0.1530	0.323	0.197	0.616	225	289	203	260	268	346	11.3	17.1
150	19	19	1.7	1.4	NA	4 x 1.0	1.4	2.0	24.0	21.0	97	1706	652	1574	0.2060	0.1240	0.264	0.160	0.607	253	326	228	293	309	390	14.2	21.4
185	37	37	1.9	1.6	NA	4 x 1.0	1.4	2.0	26.0	23.0	1067	2071	786	1914	0.1640	0.0991	0.210	0.129	0.604	286	366	257	329	360	460	17.5	26.4
240	37	37	2	1.7	NA	4 x 1.0	1.4	2.0	29.0	26.0	1322	2575	989	2410	0.1250	0.0754	0.161	0.099	0.657	332	425	299	383	433	552	22.6	34.3
300	37	37	2.1	1.8	NA	4 x 1.0	1.56	2.0	31.0	28.0	1552	3213	1161	2682	0.1000	0.0601	0.139	0.080	0.689	376	479	338	431	501	640	28.3	42.9
400	61	61	2.4	2	NA	4 x 1.0	1.5	2.2	35.0	33.0	2015	4187	1517	3970	0.0778	0.0470	0.102	0.064	0.696	431	544	388	490	596	753	37.7	57.1
500	61	61	2.6	2.2	NA	4 x 1.0	1.56	2.2	38.0	36.0	2465	5187	1888	4942	0.0605	0.0366	0.0782	0.052	0.716	490	611	441	550	693	865	47.2	71.4
630	61	61	2.8	2.4	NA	4 x 1.0	1.72	2.2	43.0	40.0	2969	6481	2325	6130	0.0469	0.0283	0.0606	0.0368	0.745	557	684	501	616	814	1001	59.4	90.0
800	61	61	3.1	2.6	NA	4 x 1.0	1.72	2.4	48.0	44.0	3651	7967	2931	7584	0.0367	0.0221	0.047	0.0287	0.756	632	762	569	686	968	1176	75.5	114.3
1000	61	61	3.3	2.8	NA	4 x 1.0	1.88	2.6	53.0	49.0	4648	10112	3650	9705	0.0291	0.0176	0.038	0.0229	0.922	701	828	631	745	1102	1299	94.3	142.9

**TABLE-10: 2 CORE XLPE INSULATED ARMoured & UNARMoured CABLE WITH ALUMINIUM/ COPPER CONDUCTOR.(AS-IS:7098(1))**

Area mm <sup>2</sup>	Cond. Min. No. of Wires		Insulation Thickness mm	Inner Thickness mm	Dimension of Armour Wire Strip		Outer Thickness		Approx.O.D.		Approx. Net Wt. Of Cable		Max. D.C. resistance at 20°C Ohm/km	Approx. A.C. resistance at 90°C Ohm/km	Approx. capacitance/phase µf/km	Current Rating				Short Circuit rating for 1 sec.	
	Al	Cu			Al/Cu	Al/Cu	Al/Cu	Al/Cu	Arm	Un-Arm	Arm	Un-Arm				Arm	Un-Arm	In Ground	In Duct	In Air	Amps
1.5	1	1	0.7	0.3	1.4	1.4	1.4	1.4	11.0	11.0	383	152	12.1	15.5	0.051	33	30	29	0.21	0.21	
2.5	1	1	0.7	0.3	1.4	1.4	1.4	1.4	13.0	13.0	470	240	7.41	9.5	0.058	43	39	39	0.38	0.57	
4	1	1	0.7	0.3	1.4	1.4	1.4	1.4	15.0	15.0	544	304	4.61	5.9	0.065	55	50	50	0.57	0.86	
6	1	1	0.7	0.3	1.4	1.4	1.4	1.4	16.0	16.0	619	328	3.94	5.9	0.071	74	64	64	0.88	1.4	
10	1	1	0.7	0.3	1.4	1.4	1.4	1.4	18.0	18.0	639	288	3.08	5.9	0.081	91	82	82	1.13	2.3	
16	1	1	0.7	0.3	1.4	1.4	1.4	1.4	17.0	17.0	586	283	1.91	2.44	0.088	120	108	108	1.5	3.6	
25	1	1	0.9	0.3	1.4	1.4	1.4	1.4	20.0	20.0	750	320	1.2000	0.671	0.099	143	129	129	2.4	5.0	
35	1	1	0.9	0.3	1.4	1.4	1.4	1.4	21.0	21.0	890	320	0.8680	0.671	0.099	167	150	150	3.3	7.1	
50	1	1	1.1	0.3	1.4	1.4	1.4	1.4	22.0	22.0	1090	320	0.6410	0.466	0.10	204	184	184	4.7	10.0	
70	1	1	1.1	0.3	1.4	1.4	1.4	1.4	26.0	26.0	1464	320	0.344	0.344	0.10	245	221	221	6.6	13.0	
95	1	1	1.1	0.4	1.4	1.4	1.4	1.4	30.0	30.0	1960	320	0.1930	0.409	0.10	278	250	250	9.0	17.1	
120	1	1	1.2	0.4	1.4	1.4	1.4	1.4	32.0	32.0	1990	320	0.1530	0.323	0.11	315	284	284	11.3	21.4	
150	1	1	1.4	0.4	1.4	1.4	1.4	1.4	35.0	35.0	1900	320	0.1240	0.264	0.11	356	320	320	14.2	26.4	
185	1	1	1.6	0.5	1.4	1.4	1.4	1.4	40.0	40.0	1490	320	0.0991	0.210	0.11	407	366	366	17.5	34.3	
240	1	1	1.7	0.5	1.4	1.4	1.4	1.4	42.0	42.0	1330	320	0.0754	0.161	0.11	463	417	417	22.6	42.9	
300	1	1	1.8	0.6	1.4	1.4	1.4	1.4	50.0	50.0	930	320	0.0601	0.129	0.12	528	475	475	28.3	57.1	
400	1	1	2.0	0.7	1.4	1.4	1.4	1.4	54.0	54.0	680	320	0.0470	0.102	0.12	592	533	533	37.7	71.4	
500	1	1	2.2	0.7	1.4	1.4	1.4	1.4	62.0	62.0	4950	320	0.0366	0.0782	0.12	676	614	614	47.2	90.0	
630	1	1	2.4	0.7	1.4	1.4	1.4	1.4	68.0	68.0	13748	4670	0.0469	0.0283	0.11	813	733	733	59.4	113.0	

**TABLE-11 : 3 CORE XLPE INSULATED ARMoured & UNARMoured CABLE WITH ALUMINIUM/ COPPER CONDUCTOR. (AS-IS: 7098(1))**

Area mm <sup>2</sup>	Cond. in. No. of Wires		Insulation Thickness mm	Inner Thickness mm	Dimension of Arm Wire Strip		Outer Thickness		Approx.O.D.		Approx. Net Wt. Of Cable		Max. D.C. resistance at 20°C Ohm/km	Approx. A.C. resistance at 90°C Ohm/km	Approx. capacitance/phase µf/km	Current Rating				Short Circuit rating for 1 sec.	
	Al	Cu			Al/Cu	Al/Cu	Al/Cu	Al/Cu	Arm	Un-Arm	Arm	Un-Arm				In Ground	In Duct	In Air	Amps	KA	Al
1.5	1	1	0.7	0.3	1.4	1.4	1.4	1.4	11	11	417	173	12.1	15.5	0.15	25	23	22	0.21	0.21	
2.5	1	1	0.7	0.3	1.4	1.4	1.4	1.4	14	14	588	208	7.41	9.5	0.22	34	31	31	0.38	0.57	
4	1	1	0.7	0.3	1.4	1.4	1.4	1.4	15	15	581	233	3.08	5.9	0.31	43	39	39	0.57	0.86	
6	1	1	0.7	0.3	1.4	1.4	1.4	1.4	17	17	678	324	1.83	3.94	0.36	57	51	51	0.88	1.4	
10	1	1	0.7	0.3	1.4	1.4	1.4	1.4	18	18	596	360	1.91	2.44	0.41	73	66	66	1.13	2.3	
16	1	1	0.7	0.3	1.4	1.4	1.4	1.4	20	20	790	410	1.2000	0.671	0.47	94	82	82	1.5	3.6	
25	1	1	0.9	0.3	1.4	1.4	1.4	1.4	22	22	930	410	0.8680	0.671	0.50	113	102	102	2.4	5.0	
35	1	1	0.9	0.3	1.4	1.4	1.4	1.4	23	23	1090	410	0.6410	0.466	0.50	133	120	120	3.3	7.1	
50	1	1	1.0	0.3	1.4	1.4	1.4	1.4	26	26	1489	410	0.3870	0.323	0.60	164	148	148	4.7	10.0	
70	1	1	1.1	0.4	1.4	1.4	1.4	1.4	30	30	2098	410	0.2680	0.344	0.61	196	176	176	6.6	13.0	
95	1	1	1.1	0.4	1.4	1.4	1.4	1.4	32	32	1720	468	0.1930	0.409	0.63	223	202	202	9.0	17.1	
120	1	1	1.2	0.4	1.4	1.4	1.4	1.4	35	35	2030	427	0.1530	0.323	0.63	249	224	224	11.3	21.4	
150	1	1	1.4	0.4	1.4	1.4	1.4	1.4	42	42	2430	520	0.1240	0.264	0.60	282	254	254	14.2	26.4	
185	1	1	1.6	0.5	1.4	1.4	1.4	1.4	44	44	2930	631	0.0991	0.210	0.63	326	293	293	17.5	34.3	
240	1	1	1.7	0.5	1.4	1.4	1.4	1.4	51	51	4360	930	0.0754	0.161	0.67	367	330	330	22.6	42.9	
300	1	1	1.8	0.6	1.4	1.4	1.4	1.4	54	54	4360	930	0.0601	0.129	0.67	418	376	376	28.3	57.1	
400	1	1	2.0	0.7	1.4	1.4	1.4	1.4	61	61	5440	1283	0.0470	0.102	0.69	470	423	423	37.7	71.4	
500	1	1	2.2	0.7	1.4	1.4	1.4	1.4	68	68	6890	1597	0.0366	0.0782	0.73	529	444	444	47.2	90.0	
630	1	1	2.4	0.7	1.4	1.4	1.4	1.4	77.5	77.5	19662	6630	0.0469	0.0283	0.73	614	560	560	59.4	113.0	



**TABLE-12 : 3.5 CORE XLPE INSULATED ARMoured & UNARMoured CABLE WITH ALUMINIUM/ COPPER CONDUCTOR. (AS-IS: 7098(I))**

Area mm <sup>2</sup>	Cond. Min. No. of Wires	Insulation Thickness		Inner Thick- ness		Dimension of Arm Wire Strip		Outer Thickness		Approx. O.D.		Approx. Net Wt. Of Cable		Max. D.C. resistance at 20°C		Approx. A.C. resistance at 90°C		Approx. capacitance/ phase		Current Rating				Short Circuit rating for 1 sec.				
		mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
25	7	0.9/0.7	0.3	4x0.8	1.4	2.0	23.0	22.0	890	1409	480	1033	1.2000	0.7270	1.538	0.931	0.41	94	122	85	110	96	123	2.4	3.6			
35	7	1.0/0.9	0.3	4x0.8	1.4	2.0	25.0	24.0	1030	1765	590	1410	0.8690	0.5240	1.110	0.671	0.47	113	146	102	131	117	151	3.3	5.0			
50	7	1.1/1.0	0.3	4x0.8	1.4	2.0	28.0	27.0	1460	2230	740	1848	0.6410	0.3870	0.818	0.496	0.50	133	172	120	155	142	183	4.7	7.1			
70	19	1.1/0.9	0.3	4x0.8	1.56	2.2	33.0	32.0	1600	3112	1000	2629	0.4430	0.2680	0.565	0.344	0.61	164	211	148	190	179	231	6.6	10.0			
95	19	1.1/1.0	0.4	4x0.8	1.56	2.2	36.0	35.0	1970	4018	1290	3416	0.3200	0.1930	0.409	0.248	0.63	196	253	176	228	221	285	9.0	13.6			
120	19	1.2/1.1	0.4	4x0.8	1.72	2.4	40.0	39.0	2390	5035	1600	4338	0.2530	0.1530	0.323	0.197	0.66	223	287	201	256	257	330	11.3	17.1			
150	19	1.4/1.1	0.4	4x0.8	1.72	2.4	45.0	43.0	2770	6022	1930	5362	0.2060	0.1240	0.264	0.160	0.6	249	321	224	289	292	375	14.2	21.4			
185	37	1.6/1.1	0.5	4x0.8	1.88	2.6	50.0	48.0	3360	7425	2420	6664	0.1640	0.0991	0.210	0.129	0.6	282	361	254	325	337	430	17.5	26.4			
240	37	1.7/1.2	0.5	4x0.8	2.04	2.8	56.0	55.0	4190	9268	3100	8448	0.1250	0.0794	0.161	0.099	0.63	326	416	293	374	389	508	22.8	34.3			
300	37	1.8/1.4	0.6	4x0.8	2.2	3.0	61.0	60.0	4990	11237	3800	10347	0.1000	0.0601	0.129	0.080	0.67	367	464	330	418	456	576	28.3	42.9			
400	61	2.0/1.6	0.7	4x0.8	2.52	3.4	69.0	68.0	6220	14929	4840	13938	0.0778	0.0470	0.102	0.064	0.67	418	521	376	469	530	661	37.7	57.1			
500	61	2.2/1.7	0.7	4x0.8	2.68	3.6	76.0	75.0	7570	18518	6020	17415	0.0615	0.0366	0.0782	0.052	0.69	470	582	423	524	612	753	47.2	71.4			
630	61	2.4/1.8	0.7	4x0.8	3.0	4.0	86.0	85.0	9450	23143	7710	21951	0.0469	0.0283	0.061	0.043	0.73	529	644	476	580	707	851	59.4	90.0			

**TABLE-13 : 4 CORE XLPE INSULATED ARMoured & UNARMoured CABLE WITH ALUMINIUM/ COPPER CONDUCTOR. (AS-IS: 7098(I))**

Area mm <sup>2</sup>	Cond. Min. No. of wires	Insulation Thickness		Inner Thick- ness		Dimension of Arm Wire Strip		Outer Thickness		Approx. O.D.		Approx. Net Wt. Of Cable		Max. D.C. resistance at 20°C		Approx. A.C. resistance at 90°C		Approx. capacitance/ phase		Current Rating				Short Circuit rating for 1 sec.				
		mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
1.5	-	0.7	0.3	1.4	1.24	1.8	15.0	12.0	-	458	-	203	-	12.1	-	15.5	0.15	-	25	-	23	-	22	-	0.21			
2.5	-	0.7	0.3	1.4	1.24	1.8	16.0	13.0	-	549	-	259	-	7.41	-	9.5	0.18	-	34	-	31	-	30	-	0.36			
4	1	0.7	0.3	1.4	1.24	1.8	17.0	15.0	596	700	242	346	7.41	4.61	9.5	5.9	0.22	34	44	31	40	31	40	0.38	0.57			
6	1	0.7	0.3	1.4	1.24	1.8	18.0	16.0	664	814	289	439	4.61	3.08	5.9	3.94	0.31	43	55	39	50	40	51	0.57	0.86			
10	1	0.7	0.3	1.4	1.4	1.8	20.0	18.0	785	1033	378	626	3.08	1.83	3.94	2.34	0.36	57	73	51	66	53	70	0.94	1.4			
16	7	0.7	0.3	4x0.8	1.4	1.8	22.0	19.0	1284	1663	454	833	1.91	1.15	2.44	1.47	0.41	73	97	66	87	70	90	1.5	2.3			
25	7	0.90	0.3	4x0.8	1.4	2.0	24.0	22.0	950	1532	520	1204	1.2000	0.7270	1.530	0.931	0.41	94	122	85	110	96	123	2.4	3.6			
35	7	1.00	0.3	4x0.8	1.4	2.0	26.0	25.0	1120	1982	650	1578	0.8690	0.5240	1.110	0.671	0.47	113	146	102	131	117	151	3.3	5.0			
50	7	1.10	0.3	4x0.8	1.56	2.2	29.0	28.0	1360	2507	810	2049	0.6410	0.3870	0.818	0.496	0.50	133	172	120	155	142	183	4.7	7.1			
70	19	1.10	0.4	4x0.8	1.56	2.2	33.0	32.0	1730	3459	1110	2969	0.4430	0.2680	0.565	0.344	0.63	164	211	148	190	179	231	6.6	10.0			
95	19	1.10	0.4	4x0.8	1.56	2.2	36.0	35.0	2130	4462	1430	3910	0.3200	0.1930	0.409	0.248	0.61	196	253	176	228	221	285	9.0	13.6			
120	19	1.20	0.5	4x0.8	1.72	2.4	41.0	39.0	2580	5511	1790	4854	0.2530	0.1530	0.323	0.197	0.63	223	287	201	256	257	330	11.3	17.1			
150	19	1.40	0.5	4x0.8	1.88	2.6	45.0	44.0	3080	6787	2210	6093	0.2060	0.1240	0.264	0.160	0.60	249	321	224	289	292	375	14.2	21.4			
185	37	1.60	0.5	4x0.8	2.04	2.8	50.0	49.0	3730	8284	2750	7484	0.1640	0.0991	0.210	0.129	0.60	282	361	254	325	337	430	17.5	26.4			
240	37	1.70	0.6	4x0.8	2.2	3.0	56.0	55.0	4680	10373	3530	9609	0.1250	0.0754	0.161	0.099	0.63	326	416	293	374	389	508	22.8	34.3			
300	37	1.80	0.7	4x0.8	2.36	3.2	62.0	61.0	5590	12940	4330	12338	0.1000	0.0601	0.129	0.080	0.67	367	464	330	418	456	576	28.3	42.9			
400	61	2.00	0.7	4x0.8	2.68	3.6	70.0	69.0	6960	16961	5510	15961	0.0778	0.0470	0.102	0.064	0.67	418	521	376	469	530	661	37.7	57.1			
500	61	2.20	0.7	4x0.8	2.84	3.8	78.0	77.0	8430	20877	6630	19897	0.0605	0.0366	0.0782	0.052	0.69	470	582	423	524	612	753	47.2	71.4			
630	61	2.40	0.7	4x0.8	3	4	87.0	87.0	10510	31428	8700	31102	0.0469	0.0283	0.0605	0.043	0.73	529	644	476	580	707	851	59.4	90.0			

**TABLE-14 : XLPE INSULATED CONTROL CABLE WITH COPPER CONDUCTOR (AS-IS:7098 (1))**

No. of cores X Area	Cond. Min. No. of wires	Insulation Thickness	Inner Thickness	Dimension of Wire Strip	Outer Thickness		Approx. O.D.		Approx. Net Wt. Of Cable		Max. D.C. resistance at 20°C	Approx. A.C. resistance at 90°C	Approx capacitance/phase	Current Rating		Short Circuit rating for 1 sec.
					mm	mm	mm	mm	mm	mm				mm	mm	
2x1.5	1.0	0.8	0.3	1.4	1.24	1.8	14	12.0	411	183	12.1	14.5	0.1	23	20	0.173
3x1.5	1.0	0.8	0.3	1.4	1.24	1.8	14	12.0	450	212	12.1	14.5	0.1	21	17	0.173
4x1.5	1.0	0.8	0.3	1.4	1.24	1.8	15	13.0	508	247	12.1	14.5	0.1	21	17	0.173
5x1.5	1.0	0.8	0.3	1.4	1.24	1.8	16	14.0	542	278	12.1	14.5	0.1	21	17	0.173
6x1.5	1.0	0.8	0.3	1.4	1.24	1.8	17	15.0	607	322	12.1	14.5	0.1	15	13	0.173
7x1.5	1.0	0.8	0.3	1.4	1.24	1.8	17	16.0	621	322	12.1	14.5	0.1	14	13	0.173
10x1.5	1.0	0.8	0.3	1.4	1.40	1.8	21	19.0	838	456	12.1	14.5	0.1	13	11	0.173
12x1.5	1.0	0.8	0.3	4x0.8	1.24	1.8	20	19.0	723	501	12.1	14.5	0.1	12	10	0.173
14x1.5	1.0	0.8	0.3	4x0.8	1.40	1.8	21	20.0	822	558	12.1	14.5	0.1	11	10	0.173
16x1.5	1.0	0.8	0.3	4x0.8	1.40	1.8	22	21.0	912	626	12.1	14.5	0.1	11	9	0.173
19x1.5	1.0	0.8	0.3	4x0.8	1.40	2.0	23	23.0	967	724	12.1	14.5	0.1	10	9	0.173
24x1.5	1.0	0.8	0.3	4x0.8	1.40	2.0	26	26.0	1225	900	12.1	14.5	0.1	9	8	0.173
27x1.5	1.0	0.8	0.3	4x0.8	1.40	2.0	27	27.0	1281	968	12.1	14.5	0.1	9	8	0.173
30x1.5	1.0	0.8	0.3	4x0.8	1.40	2.0	28	28.0	1396	1051	12.1	14.5	0.1	9	7	0.173
37x1.5	1.0	0.8	0.3	4x0.8	1.40	2.0	30	29.0	1608	1243	12.1	14.5	0.1	8	7	0.173
44x1.5	1.0	0.8	0.3	4x0.8	1.56	2.0	34	33.0	1925	1468	12.1	14.5	0.1	7	6	0.173
52x1.5	1.0	0.8	0.4	4x0.8	1.56	2.2	37	37.0	2445	1959	12.1	14.5	0.1	5	6	0.173
61x1.5	1.0	0.9	0.3	1.4	1.24	1.8	15	13.0	477	230	7.41	8.87	0.1	32	27	2.88
2x2.5	1.0	0.9	0.3	1.4	1.24	1.8	16	14.0	521	282	7.41	8.87	0.1	27	24	2.88
3x2.5	1.0	0.9	0.3	1.4	1.24	1.8	17	15.0	614	335	7.41	8.87	0.1	27	24	2.88
4x2.5	1.0	0.9	0.3	1.4	1.24	1.8	18	16.0	674	366	7.41	8.87	0.1	27	24	2.88
5x2.5	1.0	0.9	0.3	1.4	1.24	1.8	19	17.0	757	426	7.41	8.87	0.1	21	18	2.88
6x2.5	1.0	0.9	0.3	1.4	1.24	1.8	19	17.0	776	451	7.41	8.87	0.1	20	17	2.88
7x2.5	1.0	0.9	0.3	4x0.8	1.40	1.8	20	21.0	908	622	7.41	8.87	0.1	18	15	2.88
10x2.5	1.0	0.9	0.3	4x0.8	1.40	2.0	23	23.0	972	708	7.41	8.87	0.1	17	14	2.88
12x2.5	1.0	0.9	0.3	4x0.8	1.40	2.0	24	24.0	1079	795	7.41	8.87	0.1	16	13	2.88
14x2.5	1.0	0.9	0.3	4x0.8	1.40	2.0	25	24.0	1197	882	7.41	8.87	0.1	15	12	2.88
16x2.5	1.0	0.9	0.3	4x0.8	1.40	2.0	27	26.0	1356	1070	7.41	8.87	0.1	14	12	2.88
19x2.5	1.0	0.9	0.3	4x0.8	1.40	2.0	30	30.0	1651	1264	7.41	8.87	0.1	13	11	2.88
24x2.5	1.0	0.9	0.3	4x0.8	1.40	2.0	31	30.0	1750	1366	7.41	8.87	0.1	12	10	2.88
27x2.5	1.0	0.9	0.3	4x0.8	1.56	2.0	33	31.0	1923	1487	7.41	8.87	0.1	12	10	2.88
30x2.5	1.0	0.9	0.4	4x0.8	1.56	2.2	35	34.0	2269	1826	7.41	8.87	0.1	11	9	2.88
37x2.5	1.0	0.9	0.4	4x0.8	1.56	2.2	39	38.0	2662	2140	7.41	8.87	0.1	10	9	2.88
44x2.5	1.0	0.9	0.4	4x0.8	1.56	2.2	41	40.0	2985	2474	7.41	8.87	0.1	10	8	2.88
52x2.5	1.0	0.9	0.4	4x0.8	1.56	2.2	43	42.0	3385	2821	7.41	8.87	0.1	9	8	2.88
61x2.5	1.0	0.9	0.4	4x0.8	1.56	2.2	43	42.0	3385	2821	7.41	8.87	0.1	9	8	2.88



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