CABLE CATALOGUE

COMMITTED TO ENVIRONMENT,
HEALTH, SAFETY

www.bontoncablesindia.com

BONTON®
CABLES

INDIA'S MOST CERTIFIED CABLE COMPANY

Eco Friendly

About us

Bonton Cables is synonymous with dynamic and innovative insight into the cables industry of India. With a manufacturing unit in Bhiwadi, Rajasthan, over the last few Years Bonton cables has invested heavily in manufacturing infrastructure, quality systems, process controls & certifications and has become one of the most reputed wire and cable company in the country. The manufacturing unit has an inbuilt laboratory-unique because of the facilities for testing the cables as per ISO, BS, UL, BSEN, JIS, DIN, ASTM and IEC standards.

Bonton Cables is the first cable manufacturing unit in the country among the very few in the world to receive the prestigious ISO/TS: 16949: 2002 certified by UL. It has also acquired national/international product/quality certification and accreditations that are applicable in the wire and cable industry like

UL Registration

CE Certified

ISO/TS: 16949

OHSAS: 45001

ISO: 14001

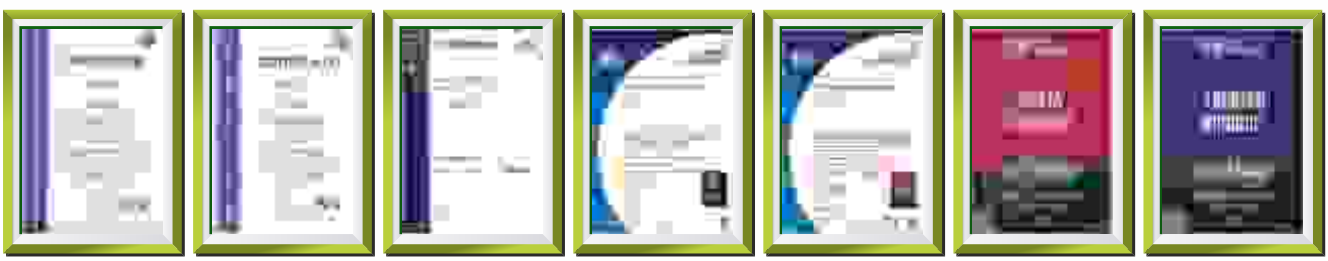
RoHS Compliance

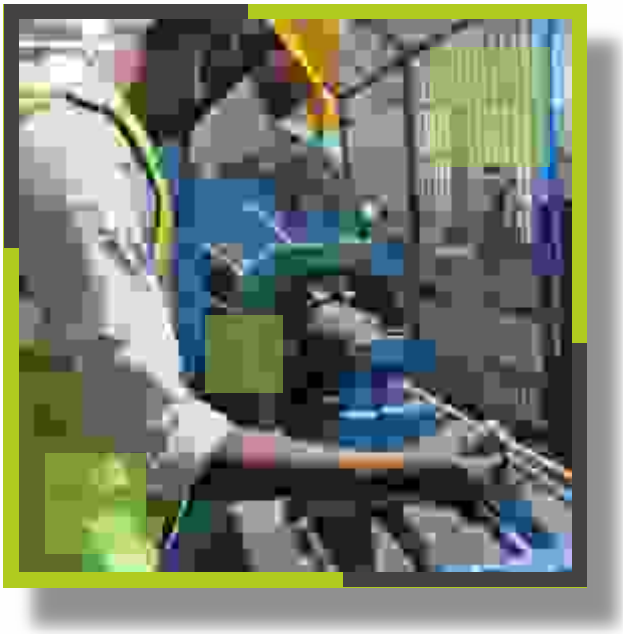
Its endeavour continues as it prepares to comply to more stringent standards and certifications to provide strong solution to the demanding industry.

Bonton Cables has made a name in the cables industry for production of specialized cables for temperatures ranging from -50° to 950°, special bending radius cables, high temperature cables, oil resistant cables and UV protected cables. Diversification of the product range is the major goal. It now provides the complete range of LT wires and cables for house wiring, instrumentation cables, power cables, telephone wires, telecom cables covering the entire gamut of household, commercial and industrial needs. Bonton Cables is the biggest supplier of energy cables to the Telecom equipment suppliers and network providers. It has been approved as a global sourcing partner for the various telecom projects. Furthermore, it has struck successful tie-ups with international companies like UK based MICC and Italy based CAVICEL for even enhanced parameters of LPCB approved Fire Survival Cables.

Bonton Cables has paved its way into the international market as a reputed exporter in the Middle East. Its premium range of FS and thermosetting halogen free wires and cables widens the horizon of its product range increasing further the scope of branching into new areas.

The graph of the company's growth rate shows a continuous steady rise. A strong infrastructure, wide range of high quality products, a well connected network of channel partners and distributors, a team of dedicated employees well trained to be competent technical professionals and an ever growing thirst to learn and improve in order to keep abreast of the latest technology, Bonton Cables is the perfect solution provider in the cables' industry.



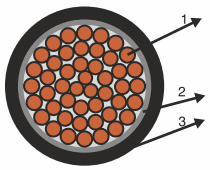
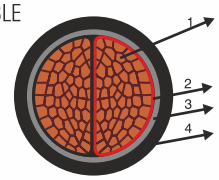
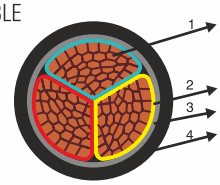
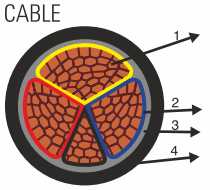
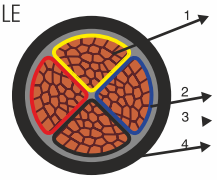


CONTENTS

Components of LV Cables

ELEMENT	XLPE	PVC/HR PVC
Conductor	Electrolytic Copper (Plain or Tinned) and Aluminium conductor in form of Solid, Stranded Circular, Compacted Circular and Shaped as per IS 8130, IEC 60228 & BS EN 60228. The sector shaped conductor are manufactured with pre-spiral lay which gives compact shape to the cable with reduced diameter at laid up stage.	
Insulation	90°C thermoset dielectric, is applied as insulation over the conductor by extrusion process. Cross Linked Polyethyelene (XLPE) as per IS 7098-1, IEC 60502-1, BS 7655.	Thermoplastic dielectric, is applied as insulation over the conductor by extrusion process. We offer both general purpose PVC of 70°C (Type A) and Heat Resistant PVC of 85°C (Type C) Poly-Vinyl Chloride (PVC) as per IS 5831, IEC 60502-1, BS 7655. Low Smoke Zero Halogen (LSZH) as per IEC 60502-1.
Laying up of Cores	The multi-cores are Laid-up with appropriate tooling to form a compact circular shape, PVC fillers can be applied (wherever necessary) to provide circular shape.	
Innersheath	PVC / LSZH innersheath is applied as a protection over the laid up cores, Innersheath can be offered in two forms Extruded or Taped. Extruded PVC bedding of ST2/LSZH as per IS 5831, IEC 60502-1, BS 7655. Cables with special properties of FR and FRLS can be offered Taped Bedding of Thermoplastic tape to be compatible with temperature rating of the cable as per IS 7098-1, IEC 60502-1.	PVC / LSZH innersheath is applied as a protection over the laid up cores, Innersheath can be offered in two forms Extruded or Taped. Extruded PVC bedding of ST1 or ST2 PVC as per IS 5831, IEC 60502-1, BS 7655. Cables with special properties of FR and FRLS can be offered Taped Bedding of Thermoplastic tape to be compatible with temperature rating of the cable as per IS 1554-1, IEC 60502-1.
Armour	Galvanised Steel Round Wire as per IS 3975, IEC 60502-1, BS 10257. Galvanised Steel Flat Strip as per IS 3975, IEC 60502-1. For Single Core cables to be used in AC circuits Aluminium Round Wire or Flat Strip armour is provided to avoid magnetic hysteresis losses. For cables to be used in mines, required armour conductance (may be 75% to 40%) can be achieved by Double wire armour or by incorporating Tinned Copper Wires with Galvanised Steel Wires	
Outersheath	PVC / LSZH outersheath is applied by extrusion process generally black in colour with sequential length marking and required details printed with non-contact ink jet printer and also embossing can be provided. Cables with special properties of FR and FRLS can be offered. Poly-Vinyl Chloride (PVC) as per IS 5831, IEC 60502-1, BS 7655. Low Smoke Zero Halogen (LSZH) as per IEC 60502-1. PVC / LSZH outersheath is applied by extrusion process generally black in colour with sequential length marking and required details printed with non-contact ink jet printer. Poly-Vinyl Chloride (PVC) as per IS 5831, IEC 60502-1, BS 7655. Low Smoke Zero Halogen (LSZH) as per IEC 60502-1.	

TYPICAL CROSS SECTIONAL VIEW (XLPE/PVC/HR PVC) CABLES

	XLPE	PVC/HR PVC
1 CORE UNARMOURED CABLE 	01. Conductor - Copper or Aluminium (A) 02. Insulation - Type " XLPE" (2X) 03. Outersheath - ST2 PVC (Y)	01. Conductor - Copper or Aluminium (A) 02. Insulation - Type " A" or "C" PVC (Y) 03. Outersheath - ST1 or ST2 PVC (Y)
	Typical Cable Codes : 2XY, A2XY	YY, AYY
2 CORE UNARMOURED CABLE 	01. Conductor - Copper or Aluminium(A) 02. Insulation - Type " XLPE" (2X) 03. Innersheath - ST2 Extruded PVC{(P)} or Thermoplastic tapes{(T)} 04. Outersheath - ST2 PVC (Y)	01. Conductor - Copper or Aluminium(A) 02. Insulation - Type " A" or "C" PVC (Y) 03. Innersheath - ST2 Extruded PVC{(P)} or Thermoplastic tapes{(T)} 04. Outersheath - ST2 PVC (Y)
	Typical Cable Codes : 2XY(P), 2XY(T), A2XY(P), A2XY(T)	YY(P), YY(T), AYY(P), AYY(T)
3 CORE UNARMOURED CABLE 	01. Conductor - Copper or Aluminium (A) 02. Insulation - Type " XLPE" (2X) 03. Innersheath - ST2 Extruded PVC {(P)} or Thermoplastic tapes {(T)} 04. Outersheath - ST2 PVC (Y)	01. Conductor - Copper or Aluminium (A) 02. Insulation - Type " A" or "C" PVC (Y) 03. Innersheath - ST1 or ST2 Extruded PVC {(P)} or Thermoplastic tapes {(T)} 4. Outersheath - ST1 or ST2 PVC (Y)
	Typical Cable Codes : 2XY(P), 2XY(T), A2XY(P), A2XY(T)	YY(P), YY(T), AYY(P), AYY(T)
3.5 CORE UNARMOURED CABLE 	01. Conductor - Copper or Aluminium (A) 02. Insulation - Type " XLPE" (2X) 03. Innersheath - ST2 Extruded PVC {(P)} or Thermoplastic tapes {(T)} 04. Outersheath - ST2 PVC (Y)	01. Conductor - Copper or Aluminium (A) 02. Insulation - Type " A" or "C" PVC (Y) 03. Innersheath - ST1 or ST2 Extruded PVC {(P)} or Thermoplastic tapes {(T)} 04. Outersheath - ST1 or ST2 PVC (Y)
	Typical Cable Codes : 2XY(P), 2XY(T), A2XY(P), A2XY(T)	YY(P), YY(T), AYY(P), AYY(T)
4 CORE UNARMOURED CABLE 	01. Conductor - Copper or Aluminium (A) 02. Insulation - Type " XLPE" (2X) 03. Innersheath - ST2 Extruded PVC {(P)} or Thermoplastic tapes {(T)} 04. Outersheath - ST2 PVC (Y)	01. Conductor - Copper or Aluminium (A) 02. Insulation - Type "A" or "C" PVC (Y) 03. Innersheath - ST1 or ST2 Extruded PVC {(P)} or Thermoplastic tapes {(T)} 04. Outersheath - ST1 or ST2 PVC (Y)
	Typical Cable Codes : 2XY(P), 2XY(T), A2XY(P), A2XY(T)	YY(P), YY(T), AYY(P), AYY(T)

TYPICAL CROSS SECTIONAL VIEW (XLPE/PVC/HR PVC) CABLES

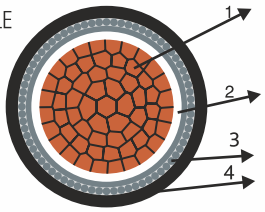
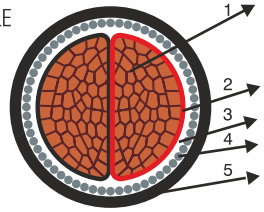
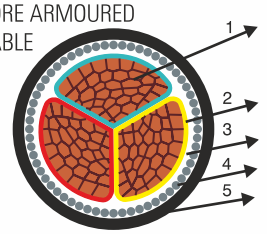
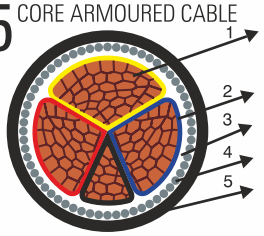
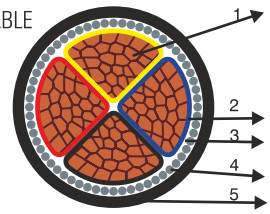
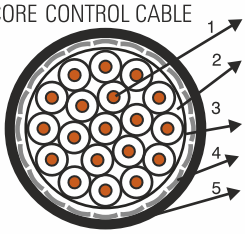
	XLPE	PVC/HR PVC
1 CORE ARMOURED CABLE 	01. Conductor - Copper or Aluminium (A) 02. Insulation - Type " XLPE" (2X) 03. Armoured - Aluminium Round wire / Flat strip 04. Outersheath - ST2 PVC (Y)	01. Conductor - Copper or Aluminium (A) 02. Insulation - Type " A" or "C" PVC (Y) 03. Armoured - Aluminium Round wire / Flat strip 04. Outersheath - ST1 or ST2 PVC (Y)
	Typical Cable Codes : 2XWaY, 2XWaY,2XFaY, 2XFaY, A2XWaY, A2XWaY,A2XFaY,A2XFaY.	YWaY, YWaY,YFaY,YFaY, AYWaY, AYWaY,AYFaY,AYFaY.
2 CORE ARMOURED CABLE 	01. Conductor - Copper or Aluminium (A) 02. Insulation - Type " XLPE" (2X) 03. Innersheath - ST2 Extruded PVC {(P)} or Thermoplastic tapes {(T)} 04. Armoured - G.S.Round wire / Flat strip 05. Outersheath - ST2 PVC (Y)	01. Conductor - Copper or Aluminium (A) 02. Insulation - Type " A" or "C" PVC (Y) 03. Innersheath - ST1 or ST2 Extruded PVC {(P)} or Thermoplastic tapes {(T)} 04. Armoured - G.S.Round wire / Flat strip 05. Outersheath - ST1 or ST2 PVC (Y)
	Typical Cable Codes : 2XWY(P), 2XWY(T), 2XFY(P), 2XFY(T), A2XWY(P), A2XWY(T), A2XFY(P), A2XFY(T).	YWY(P), YWY(T), YFY(P), YFY(T), AYWY(P), AYWY(T),AYFY(P), AYFY(T).
3 CORE ARMOURED CABLE 	01. Conductor - Copper or Aluminium (A) 02. Insulation - Type " XLPE" (2X) 03. Innersheath - ST2 Extruded PVC {(P)} or Thermoplastic tapes {(T)} 04. Armoured - G.S.Round wire / Flat strip 05. Outersheath - ST2 PVC (Y)	01. Conductor - Copper or Aluminium (A) 02. Insulation - Type "A" or "C" PVC (Y) 03. Innersheath - ST1 or ST2 Extruded PVC {(P)} or Thermoplastic tapes {(T)} 04. Armoured - G.S.Round wire / Flat strip 05. Outersheath - ST1 or ST2 PVC (Y)
	Typical Cable Codes : 2XWY(P), 2XWY(T), 2XFY(P), 2XFY(T), A2XWY(P), A2XWY(T), A2XFY(P), A2XFY(T).	YWY(P), YWY(T), YFY(P), YFY(T), AYWY(P), AYWY(T),AYFY(P), AYFY(T).
3.5 CORE ARMOURED CABLE 	01. Conductor - Copper or Aluminium (A) 02. Insulation - Type " XLPE" (2X) 03. Innersheath - ST2 Extruded PVC {(P)} or Thermoplastic tapes {(T)} 04. Armoured - G.S.Round wire / Flat strip 05. Outersheath - ST2 PVC (Y)	01. Conductor - Copper or Aluminium (A) 02. Insulation - Type " A" or "C" PVC (Y) 03. Innersheath - ST1 or ST2 Extruded PVC {(P)} or Thermoplastic tapes {(T)} 04. Armoured - G.S.Round wire / Flat strip 05. Outersheath - ST1 or ST2 PVC (Y)
	Typical Cable Codes : 2XWY(P), 2XWY(T), 2XFY(P), 2XFY(T), A2XWY(P), A2XWY(T), A2XFY(P), A2XFY(T).	YWY(P), YWY(T), YFY(P), YFY(T), AYWY(P), AYWY(T),AYFY(P), AYFY(T).
4 CORE ARMOURED CABLE 	01. Conductor - Copper or Aluminium (A) 02. Insulation - Type " XLPE" (2X) 03. Innersheath - ST2 Extruded PVC {(P)} or Thermoplastic tapes {(T)} 04. Armoured - G.S.Round wire / Flat strip 05. Outersheath - ST2 PVC (Y)	01. Conductor - Copper or Aluminium (A) 02. Insulation - Type " A" or "C" PVC (Y) 03. Innersheath - ST1 or ST2 Extruded PVC {(P)} or Thermoplastic tapes {(T)} 04. Armoured - G.S.Round wire / Flat strip 05. Outersheath - ST1 or ST2 PVC (Y)
	Typical Cable Codes : 2XWY(P), 2XWY(T), 2XFY(P), 2XFY(T), A2XWY(P), A2XWY(T), A2XFY(P), A2XFY(T).	YWY(P), YWY(T), YFY(P), YFY(T), AYWY(P), AYWY(T),AYFY(P), AYFY(T).
MULTICORE CONTROL CABLE 	1. Conductor - Copper or Aluminium (A) 2. Insulation - Type " XLPE" (2X) 3. Innersheath - ST2 Extruded PVC {(P)} or Thermoplastic tapes {(T)} 4. Armoured - G.S.Round wire / Flat strip 5. Outersheath - ST2 PVC (Y)	1. Conductor - Copper or Aluminium (A) 2. Insulation - Type " A" or "C" PVC (Y) 3. Innersheath - ST1 or ST2 Extruded PVC {(P)} or Thermoplastic tapes {(T)} 4. Armoured - G.S.Round wire / Flat strip 5. Outersheath - ST1 or ST2 PVC (Y)
	Typical Cable Codes : 2XWY(P), 2XWY(T), 2XFY(P), 2XFY(T), A2XWY(P), A2XWY(T), A2XFY(P), A2XFY(T).	YWY(P), YWY(T), YFY(P), YFY(T).

TABLE 1A: TECHNICAL DATA FOR CLASS-2 CONDUCTOR AS PER IS: 8130 - 1984

Conductor cross sectional Area (Note 1)	Minimum No of wires				Maximum D.C. Resistance			Maximum A.C. Resistance			Maximum A.C. Resistance			Maximum A.C. Resistance		
	Non Compacted		Compacted		@ 20°C			@ 90°C (XLPE)			@ 70°C (PVC)			@ 85°C (HR PVC)		
	Circular		(Circular / Shaped)		Plain Copper	Tinned Copper	Aluminium	Plain Copper	Tinned Copper	Aluminium	Plain Copper	Tinned Copper	Aluminium	Plain Copper	Tinned Copper	Aluminium
sq.mm	CU	AL	CU	AL	ohm/km	ohm/km	ohm/km	ohm/km	ohm/km	ohm/km	ohm/km	ohm/km	ohm/km	ohm/km	ohm/km	ohm/km
1.5	3	3	-	-	12.1	12.2	18.1	15.5	15.63	23.17	14.50	14.62	21.70	15.20	15.33	22.80
2.5	3	3	-	-	7.41	7.56	12.1	9.48	9.67	15.5	8.90	9.08	14.50	9.30	9.49	15.30
4	7	3	-	-	4.61	4.7	7.41	5.9	6.01	9.48	5.52	5.63	8.90	5.79	5.90	9.35
6	7	3	-	-	3.08	3.11	4.61	3.94	3.98	5.9	3.69	3.73	5.54	3.87	3.91	5.82
10	7	7	6	-	1.83	1.84	3.08	2.34	2.35	3.94	2.19	2.20	3.70	2.30	2.31	3.89
16	7	7	6	6	1.15	1.16	1.91	1.47	1.48	2.44	1.38	1.39	2.30	1.44	1.45	2.41
25	7	7	6	6	0.727	0.734	1.2	0.93	0.94	1.54	0.87	0.88	1.44	0.913	0.92	1.51
35	7	7	6	6	0.524	0.529	0.868	0.671	0.68	1.11	0.63	0.64	1.04	0.658	0.66	1.10
50	19	19	6	6	0.387	0.391	0.641	0.495	0.5	0.82	0.464	0.469	0.770	0.486	0.491	0.809
70	19	19	12	12	0.268	0.27	0.443	0.343	0.323	0.567	0.321	0.323	0.533	0.337	0.340	0.559
95	19	19	15	15	0.193	0.195	0.32	0.247	0.25	0.41	0.232	0.234	0.385	0.243	0.246	0.404
120	37	37	18	15	0.153	0.154	0.253	0.196	0.197	0.324	0.184	0.185	0.305	0.193	0.194	0.320
150	37	37	18	15	0.124	0.126	0.206	0.159	0.162	0.264	0.150	0.152	0.249	0.157	0.160	0.261
185	37	37	30	30	0.0991	0.1	0.164	0.127	0.128	0.21	0.121	0.122	0.198	0.126	0.127	0.208
240	61	37	34	30	0.0754	0.0762	0.125	0.0965	0.0975	0.16	0.0930	0.0940	0.1520	0.0972	0.0982	0.1590
300	61	61	34	30	0.0601	0.0607	0.1	0.0769	0.0777	0.128	0.0750	0.0757	0.1220	0.0787	0.0795	0.1280
400	61	61	53	53	0.047	0.0475	0.0778	0.0602	0.0608	0.1	0.0604	0.0610	0.0961	0.0630	0.0636	0.1010
500	61	61	53	53	0.0366	0.0369	0.0605	0.0468	0.0472	0.0774	0.0490	0.0494	0.0761	0.0509	0.0513	0.0796
630	91	91	53	53	0.0283	0.0286	0.0469	0.0362	0.0366	0.06	0.0401	0.0405	0.0606	0.0416	0.0420	0.0632
800	91	91	53	53	0.0221	0.0224	0.0367	0.0283	0.0287	0.047	0.0339	0.0343	0.0495	0.0351	0.0355	0.0515
1000	91	91	53	53	0.0176	0.0177	0.0291	0.0225	0.0226	0.0372	0.0297	0.0298	0.0416	0.0306	0.0307	0.0431

Note 1 : Conductors of 1.5sq.mm to 10sq.mm can be manufactured as per class-1 solid conductor as per IS 8130.

TABLE 1B: TECHNICAL DATA FOR CLASS-5 FLEXIBLE COPPER CONDUCTOR AS PER IS: 8130 - 1984

Conductor cross sectional Area	Maximum dia of individual strand in conductor	Maximum D.C. Resistance		Maximum A.C. Resistance		Maximum A.C. Resistance		Maximum A.C. Resistance	
		@ 20°C		@ 90°C (XLPE)		@ 70°C (PVC)		@ 85°C (HR PVC)	
		Plain Copper	Tinned Copper	Plain Copper	Tinned Copper	Plain Copper	Tinned Copper	Plain Copper	Tinned Copper
sq.mm	mm	ohm/km	ohm/km	ohm/km	ohm/km	ohm/km	ohm/km	ohm/km	ohm/km
0.50	0.21	39.00	40.10	49.76	51.16	46.69	48.01	49.16	50.54
0.75	0.21	26.00	26.70	33.18	34.07	31.14	31.98	32.84	33.72
1.00	0.21	19.50	20.00	24.89	25.53	23.36	23.96	24.68	25.30
1.50	0.26	13.30	13.70	17.03	17.54	15.94	16.41	16.71	17.21
2.50	0.26	7.98	8.21	10.21	10.50	9.58	9.86	10.02	10.31
4	0.31	4.95	5.09	6.33	6.51	5.93	6.09	6.22	6.39
6	0.31	3.30	3.39	4.22	4.34	3.95	4.06	4.15	4.26
10	0.41	1.91	1.95	2.44	2.49	2.29	2.33	2.40	2.45
16	0.41	1.21	1.24	1.55	1.58	1.45	1.49	1.52	1.55
25	0.41	0.780	0.795	0.9976	1.0167	0.933	0.951	0.980	0.999
35	0.41	0.554	0.565	0.7093	0.7233	0.666	0.679	0.696	0.710
50	0.41	0.386	0.393	0.4937	0.5027	0.463	0.471	0.485	0.494
70	0.51	0.272	0.277	0.3252	0.3315	0.304	0.310	0.320	0.326
95	0.51	0.206	0.210	0.2636	0.2687	0.248	0.252	0.259	0.264
120	0.51	0.161	0.164	0.2062	0.2100	0.194	0.197	0.203	0.207
150	0.51	0.129	0.132	0.1654	0.1692	0.156	0.160	0.163	0.167
185	0.51	0.106	0.108	0.1358	0.1383	0.129	0.132	0.135	0.137
240	0.51	0.0801	0.0817	0.1025	0.1045	0.0986	0.1005	0.1031	0.1051
300	0.51	0.0641	0.0654	0.0820	0.0837	0.0798	0.0813	0.0837	0.0854
400	0.51	0.0486	0.0495	0.0622	0.0634	0.0623	0.0634	0.0650	0.0662
500	0.61	0.0384	0.0391	0.0491	0.0500	0.0512	0.0520	0.0532	0.0541
630	0.61	0.0287	0.0292	0.0367	0.0373	0.0406	0.0412	0.0421	0.0427

TABLE: 2 - CAPACITANCE

1.1kV XLPE/PVC/HR PVC INSULATED CABLES - APPROXIMATE CAPACITANCE (microfarads/km)

Nominal Conductor cross sectional Area	XLPE				PVC/HR PVC			
	Single Core		Two Core	Multicore (More than Two Cores)	Single Core		Two Core	Multicore (More than Two Cores)
sq.mm	Unarmoured	Armoured			Unarmoured	Armoured		
1.50	0.189	-	0.064	0.161	0.433	-	0.153	0.369
2.50	0.229	-	0.071	0.191	0.481	-	0.166	0.408
4	0.300	-	0.081	0.244	0.576	-	0.186	0.482
6	0.354	-	0.087	0.283	0.673	-	0.201	0.554
10	0.441	-	0.096	0.347	0.831	-	0.221	0.671
16	0.515	0.371	0.100	0.401	0.965	0.776	0.236	0.770
25	0.512	0.391	0.105	0.406	1.005	0.833	0.245	0.809
35	0.592	0.450	0.111	0.464	1.156	0.955	0.259	0.922
50	0.598	0.483	0.115	0.479	1.160	0.982	0.268	0.933
70	0.624	0.512	0.117	0.490	1.306	1.102	0.275	1.024
95	0.723	0.592	0.122	0.564	1.341	1.153	0.282	1.060
120	0.774	0.641	0.127	0.605	1.539	1.320	0.297	1.207
150	0.734	0.607	0.126	0.569	1.494	1.302	0.296	1.165
185	0.712	0.617	0.127	0.563	1.515	1.338	0.300	1.189
240	0.763	0.665	0.130	0.594	1.564	1.395	0.304	1.218
300	0.790	0.693	0.130	0.616	1.570	1.412	0.306	1.229
400	0.839	0.705	0.132	0.649	1.693	1.488	0.308	1.314
500	0.857	0.707	0.133	0.666	1.646	1.471	0.310	1.292
630	0.917	0.766	0.137	0.714	1.690	1.493	0.316	1.334
800	0.946	0.778	-	-	1.867	1.647	-	-
1000	0.965	0.803	-	-	2.031	1.791	-	-

TABLE 3 - REACTANCE

1.1kV XLPE/PVC/HR PVC INSULATED CABLES - APPROXIMATE REACTANCE (ohms/km)

Conductor cross sectional Area	XLPE			PVC/HR PVC		
	Single Core		Multicore	Single Core		Multicore
sqmm	Unarmoured	Armoured		Unarmoured	Armoured	
1.50	0.120	-	0.108	0.1239	-	0.1116
2.50	0.113	-	0.1007	0.1201	-	0.1077
4	0.107	-	0.0947	0.1160	-	0.1035
6	0.103	-	0.0902	0.1106	-	0.0980
10	0.098	-	0.0852	0.1045	-	0.0918
16	0.094	0.101	0.0815	0.0999	0.1058	0.0871
25	0.095	0.100	0.0816	0.0989	0.1037	0.0861
35	0.092	0.097	0.0794	0.0962	0.1004	0.0833
50	0.092	0.096	0.0792	0.0966	0.0997	0.0837
70	0.088	0.091	0.0752	0.0910	0.0937	0.0780
95	0.086	0.089	0.0734	0.0905	0.0928	0.0775
120	0.0857	0.0879	0.0726	0.0886	0.0906	0.0755
150	0.0863	0.0886	0.0732	0.0889	0.0911	0.0758
185	0.0858	0.0875	0.0727	0.0881	0.0898	0.0750
240	0.0851	0.0866	0.0719	0.0876	0.0891	0.0745
300	0.0843	0.0857	0.0711	0.0870	0.0884	0.0740
400	0.0837	0.0855	0.0705	0.0865	0.0880	0.0730
500	0.0835	0.0851	0.0703	0.0863	0.0879	0.0732
630	0.0829	0.0843	0.0697	0.0859	0.0876	0.0728
800	0.0826	0.0841	-	0.0848	0.0863	-
1000	0.0823	0.0836	-	0.0838	0.0851	-

TABLE 4 A- IMPEDANCE (Plain Copper Conductor) @ 70°C, 85°C & 90°C

1.1kV XLPE/PVC/HR PVC INSULATED CABLES - APPROXIMATE IMPEDANCE (ohms/km)

Conductor cross sectional Area	XLPE			PVC			HR PVC		
	Single Core @90°C		Multicore @ 90°C	Single Core @70°C		Multicore @ 70°C	Single Core @85°C		Multicore @ 85°C
sqmm	Unarmoured	Armoured		Unarmoured	Armoured		Unarmoured	Armoured	
1.50	15.5005	-	15.5004	14.5005	-	14.5004	15.2005	-	15.2004
2.50	9.4807	-	9.4805	8.9008	-	8.9007	9.3008	-	9.3006
4	5.9010	-	5.9008	5.5212	-	5.5210	5.7912	-	5.7909
6	3.9413	-	3.9410	3.6917	-	3.6913	3.8716	-	3.8712
10	2.3421	-	2.3416	2.1925	-	2.1919	2.3024	-	2.3018
16	1.4730	1.4735	1.4723	1.3836	1.3840	1.3827	1.4435	1.4439	1.4426
25	0.9348	0.9353	0.9336	0.8756	0.8762	0.8743	0.9183	0.9189	0.9171
35	0.6773	0.6780	0.6757	0.6373	0.6379	0.6355	0.6650	0.6656	0.6633
50	0.5035	0.5041	0.5013	0.4739	0.4746	0.4715	0.4955	0.4961	0.4932
70	0.3542	0.3549	0.3511	0.3336	0.3344	0.3303	0.3491	0.3498	0.3459
95	0.2617	0.2625	0.2577	0.2490	0.2499	0.2446	0.2593	0.2601	0.2551
120	0.2139	0.2148	0.2090	0.2042	0.2051	0.1989	0.2124	0.2132	0.2072
150	0.1809	0.1820	0.1750	0.1744	0.1755	0.1681	0.1804	0.1815	0.1743
185	0.1533	0.1542	0.1463	0.1497	0.1507	0.1424	0.1537	0.1547	0.1466
240	0.1286	0.1297	0.1204	0.1278	0.1288	0.1192	0.1308	0.1319	0.1225
300	0.1141	0.1151	0.1048	0.1149	0.1159	0.1054	0.1173	0.1184	0.1080
400	0.1031	0.1045	0.0927	0.1055	0.1067	0.0947	0.1070	0.1082	0.0964
500	0.0957	0.0971	0.0845	0.0992	0.1006	0.0881	0.1002	0.1016	0.0892
630	0.0904	0.0917	0.0785	0.0948	0.0963	0.0831	0.0954	0.0970	0.0838
800	0.0873	0.0888	-	0.0913	0.0927	-	0.0918	0.0932	-
1000	0.0853	0.0866	-	0.0889	0.0901	-	0.0892	0.0904	-

TABLE 4 B- IMPEDANCE (Aluminium Conductor) @ 70°C, 85°C & 90°C

1.1kV XLPE/PVC/HR PVC INSULATED CABLES - APPROXIMATE IMPEDANCE (ohms/km)

Conductor cross sectional Area	XLPE			PVC			HR PVC		
	Single Core @ 90°C		Multicore @ 90°C	Single Core @ 70°C		Multicore @ 70°C	Single Core @ 85°C		Multicore @ 85°C
sqmm	Unarmoured	Armoured		Unarmoured	Armoured		Unarmoured	Armoured	
1.50	23.1703	-	23.1702	21.7004	-	21.7003	22.8003	-	22.8003
2.50	15.5004	-	15.5003	14.5005	-	14.5004	15.3005	-	15.3004
4	9.4806	-	9.4805	8.9008	-	8.9006	9.3507	-	9.3506
6	5.9009	-	5.9007	5.5411	-	5.5409	5.8211	-	5.8208
10	3.9412	-	3.9409	3.7015	-	3.7011	3.8914	-	3.8911
16	2.4418	2.4421	2.4414	2.3022	2.3024	2.3016	2.4121	2.4123	2.4116
25	1.5429	1.5432	1.5422	1.4434	1.4437	1.4426	1.5132	1.5136	1.5125
35	1.1138	1.1142	1.1128	1.0444	1.0448	1.0433	1.0146	1.0150	1.0134
50	0.8252	0.8255	0.8238	0.7760	0.7764	0.7745	0.8147	0.8151	0.8133
70	0.5738	0.5743	0.5720	0.5407	0.5412	0.5387	0.5664	0.5668	0.5644
95	0.4190	0.4195	0.4165	0.3955	0.3960	0.3927	0.4140	0.4145	0.4114
120	0.3351	0.3357	0.3320	0.3176	0.3182	0.3142	0.3320	0.3326	0.3288
150	0.2777	0.2785	0.2740	0.2644	0.2651	0.2603	0.2757	0.2764	0.2718
185	0.2269	0.2275	0.2222	0.2167	0.2174	0.2117	0.2259	0.2266	0.2211
240	0.1812	0.1819	0.1754	0.1754	0.1762	0.1693	0.1815	0.1823	0.1756
300	0.1532	0.1540	0.1464	0.1498	0.1507	0.1427	0.1548	0.1556	0.1479
400	0.1304	0.1315	0.1224	0.1293	0.1303	0.1207	0.1330	0.1340	0.1246
500	0.1138	0.1150	0.1046	0.1151	0.1163	0.1056	0.1174	0.1186	0.1081
630	0.1023	0.1034	0.0920	0.1051	0.1065	0.0947	0.1066	0.1080	0.0964
800	0.0950	0.0964	-	0.0982	0.0995	-	0.0992	0.1005	-
1000	0.0903	0.0915	-	0.0936	0.0947	-	0.0942	0.0954	-

TABLE 5 A- VOLTAGE DROP (Plain Copper Conductor) @ 70°C, 85°C & 90°C

1.1kV XLPE/PVC/HR PVC INSULATED CABLES - APPROXIMATE VOLTAGE DROP (mV/A/m)

Conductor cross sectional Area	XLPE			PVC			HR PVC		
	Single Phase @ 90°C		3 Phase @ 90°C	Single Phase @70°C		3 Phase @ 70°C	Single Phase @ 85°C		3 Phase @ 85°C
sqmm	Unarmoured	Armoured		Unarmoured	Armoured		Unarmoured	Armoured	
1.50	31.0009	-	26.8156	29.0011	-	25.0857	30.4010	-	26.2967
2.50	18.9614	-	16.4013	17.8016	-	15.3981	18.6016	-	16.0901
4	11.8020	-	10.2083	11.0424	-	9.5513	11.5823	-	10.0183
6	7.8827	-	6.8180	7.3833	-	6.3860	7.7432	-	6.6972
10	4.6841	-	4.0509	4.3850	-	3.7920	4.6047	-	3.9822
16	2.9461	2.9469	2.5470	2.7672	2.7681	2.3922	2.8869	2.8878	2.4958
25	1.8696	1.8706	1.6151	1.7512	1.7523	1.5125	1.8367	1.8377	1.5865
35	1.3546	1.3559	1.1689	1.2746	1.2759	1.0994	1.3300	1.3312	1.1474
50	1.0070	1.0083	0.8673	0.9479	0.9492	0.8157	0.9910	0.9922	0.8532
70	0.7083	0.7097	0.6075	0.6673	0.6688	0.5715	0.6981	0.6996	0.5984
95	0.5234	0.5250	0.4458	0.4981	0.4997	0.4232	0.5186	0.5202	0.4413
120	0.4279	0.4296	0.3616	0.4084	0.4102	0.3441	0.4247	0.4264	0.3585
150	0.3618	0.3640	0.3028	0.3487	0.3510	0.2908	0.3608	0.3630	0.3016
185	0.3065	0.3085	0.2532	0.2994	0.3014	0.2463	0.3075	0.3095	0.2537
240	0.2573	0.2593	0.2082	0.2555	0.2576	0.2061	0.2617	0.2637	0.2119
300	0.2282	0.2302	0.1812	0.2297	0.2319	0.1823	0.2346	0.2367	0.1869
400	0.2061	0.2091	0.1604	0.2110	0.2135	0.1639	0.2140	0.2165	0.1668
500	0.1914	0.1942	0.1461	0.1985	0.2013	0.1524	0.2004	0.2031	0.1542
630	0.1808	0.1834	0.1359	0.1896	0.1927	0.1438	0.1909	0.1940	0.1451
800	0.1746	0.1775	-	0.1826	0.1854	-	0.1836	0.1863	-
1000	0.1706	0.1732	-	0.1778	0.1803	-	0.1784	0.1809	-

TABLE 5 B- VOLTAGE DROP (Aluminium Conductor) @ 70°C, 85°C & 90°C

1.1kV XLPE/PVC INSULATED CABLES - APPROXIMATE VOLTAGE DROP (mV/A/m)

Conductor cross sectional Area	XLPE			PVC			HR PVC		
	Single Phase @90°C		3 Phase @ 90°C	Single Phase @70°C		3 Phase @ 70°C	Single Phase @85°C		3 Phase @ 85°C
sqmm	Unarmoured	Armoured		Unarmoured	Armoured		Unarmoured	Armoured	
1.50	46.3406	-	40.0845	43.4007	-	37.5415	45.6007	-	39.4445
2.50	31.0008	-	26.8156	29.0010	-	25.0857	30.6009	-	26.4697
4	18.9612	-	16.4012	17.8015	-	15.3980	18.7014	-	16.1765
6	11.8018	-	10.2082	11.0822	-	9.5857	11.6421	-	10.0700
10	7.8824	-	6.8178	7.4030	-	6.4030	7.7828	-	6.7316
16	4.8837	4.8842	4.2236	4.6043	4.6049	3.9819	4.8241	4.8246	4.1720
25	3.0858	3.0864	2.6679	2.8868	2.8875	2.4956	3.0265	3.0271	2.6165
35	2.2277	2.2284	1.9252	2.0889	2.0897	1.8050	2.0291	2.0300	1.7532
50	1.6503	1.6511	1.4252	1.5521	1.5529	1.3399	1.6295	1.6302	1.4070
70	1.1476	1.1485	0.9895	1.0814	1.0823	0.9319	1.1327	1.1336	0.9764
95	0.8380	0.8391	0.7206	0.7910	0.7921	0.6794	0.8280	0.8290	0.7117
120	0.6703	0.6714	0.5744	0.6352	0.6363	0.5436	0.6641	0.6652	0.5688
150	0.5555	0.5569	0.4740	0.5288	0.5303	0.4503	0.5514	0.5529	0.4702
185	0.4537	0.4550	0.3845	0.4334	0.4348	0.3663	0.4518	0.4531	0.3825
240	0.3624	0.3639	0.3035	0.3509	0.3524	0.2928	0.3631	0.3645	0.3038
300	0.3065	0.3080	0.2533	0.2997	0.3013	0.2469	0.3095	0.3111	0.2558
400	0.2608	0.2631	0.2117	0.2586	0.2606	0.2088	0.2660	0.2679	0.2156
500	0.2277	0.2300	0.1809	0.2301	0.2325	0.1827	0.2348	0.2372	0.1871
630	0.2046	0.2069	0.1591	0.2102	0.2130	0.1639	0.2133	0.2160	0.1668
800	0.1901	0.1928	-	0.1964	0.1990	-	0.1984	0.2010	-
1000	0.1805	0.1831	-	0.1871	0.1894	-	0.1885	0.1908	-

TABLE 6- SHORT CIRCUIT CURRENT RATINGS

1.1kV XLPE/PVC INSULATED CABLES - Short Circuit Ratings for 1 second for Type "A" PVC & Type "C" HR PVC Insulated Cables.

Conductor cross sectional Area	XLPE Insulated (for 90°C)		Type "A" PVC Insulated (for 70°C)		Type "C" HR PVC Insulated (for 85°C)	
sqmm	Copper	Aluminium	Copper	Aluminium	Copper	Aluminium
1.50	0.21	0.14	0.173	0.114	0.16	0.10
2.50	0.36	0.24	0.283	0.190	0.26	0.17
4	0.57	0.38	0.46	0.303	0.42	0.27
6	0.86	0.57	0.69	0.455	0.62	0.41
10	1.43	0.94	1.15	0.758	1.04	0.69
16	2.29	1.51	1.84	1.21	1.66	1.01
25	3.58	2.36	2.88	1.90	2.59	1.72
35	5.01	3.31	4.03	2.65	3.63	2.40
50	7.15	4.72	5.75	3.79	5.19	3.43
70	10.02	6.61	8.05	5.31	7.26	4.80
95	13.59	8.98	10.90	7.20	9.86	6.52
120	17.17	11.34	13.80	9.10	12.45	8.23
150	21.46	14.17	17.30	11.40	15.57	10.29
185	26.47	17.48	21.30	14.02	19.2	12.69
240	34.34	22.68	27.60	18.20	24.91	16.46
300	42.92	28.34	34.50	22.80	31.13	20.58
400	57.23	37.79	46.00	30.40	41.51	27.44
500	71.54	47.24	57.50	38.00	51.89	34.30
630	90.14	59.52	72.50	47.25	65.38	43.21
800	114.46	75.58	92.00	60.00	83.02	54.88
1000	143.08	94.48	115.00	75.00	103.78	68.59

1) Maximum Initial Conductor tempearture before short circuit :
for cross linked Polyethelene (XLPE) - 90°C
for general purpose PVC (Type A) - 70°C
for Heat Resistant PVC (Type C) - 85°C

2) Maximum final Conductor temperature during short circuit (XLPE) : 250°C

Maximum final Conductor temperature during short circuit (PVC): 160°C

Short Circuit Rating for other duration can be calculated from :

$$IscT = \frac{Isc1}{\sqrt{T}}$$

IscT = Short Circuit rating for "T" seconds
Isc1 = Short Circuit rating for one second
T = Duration in seconds

BASIC ASSUMPTION FOR CURRENT RATINGS & RATING FACTORS

SCOPE

The current ratings of cables as indicated in various tables have been calculated on certain assumed conditions. In actual practice these conditions may be different. Therefore to determine the actual current ratings as per installation conditions, the tabulated ratings shall be multiplied with appropriate factors

BASIC ASSUMPTION FOR CURRENT RATINGS

	XLPE	PVC/HR PVC
Maximum permissible temperature	90°C for Cross linked polyethylene	70°C for general purpose PVC, 85°C for HR PVC
Ground/Duct temperature	30°C	30°C
Ambient temperature	40°C	40°C
Thermal resistivity of soil	150°C cm/W	150°C cm/W
Depth of laying - for 1.1kV cables	for 1.1kV cables - 750mm	for 1.1kV cables - 750mm

Single Core cables installed in one circuit in following arrangement
Multi Core cables installed in single circuit

TABLE 7A- CURRENT RATINGS - XLPE CABLES

TWO SINGLE CORE UNARMOURED / ARMOURED CABLES ACCORDING TO IS 7098-1

Conductor cross sectional Area	Direct in Ground (30°C) Amp.		Direct in Duct (30°C) Amp.		Direct in Air (40°C) Amp.	
	Copper	Aluminium	Copper	Aluminium	Copper	Aluminium
sqmm	XLPE	XLPE	XLPE	XLPE	XLPE	XLPE
1.50	31	24	29	22	25	20
2.50	41	32	36	29	33	27
4	54	42	49	39	44	35
6	68	52	64	50	55	44
10	89	69	85	65	80	61
16	116	90	114	85	104	82
25	148	115	142	110	139	109
35	181	139	169	127	172	136
50	213	162	195	145	213	164
70	259	199	235	181	271	208
95	310	241	269	212	335	258
120	352	272	299	237	389	303
150	393	305	324	253	447	348
185	444	347	356	278	524	407
240	518	406	419	327	623	487
300	583	461	464	368	722	567
400	657	527	532	431	850	668
500	731	600	582	490	976	786
630	823	666	649	542	1130	922
800	907	750	740	619	1279	1065
1000	981	833	800	687	1430	1220

Note : Normal current ratings are given in standard conditions, if site conditions are different, current rating should be multiplied by rating factor as given in page no. 25-27

TABLE 7B- CURRENT RATINGS - PVC/HR PVC CABLES

TWO SINGLE CORE UNARMOURED / ARMOURED CABLES ACCORDING TO IS 1554-1

Conductor cross sectional Area	Direct in Ground (30°C) Amp.				In Duct (30°C) Amp.				In Air (40°C) Amp.			
	Copper		Aluminium		Copper		Aluminium		Copper		Aluminium	
sqmm	"A" PVC	"C" HR PVC	"A" PVC	"C" HR PVC	"A" PVC	"C" HR PVC	"A" PVC	"C" HR PVC	"A" PVC	"C" HR PVC	"A" PVC	"C" HR PVC
1.50	25	29	21	24	23	27	19	22	24	29	18	22
2.50	35	41	28	32	31	36	25	29	32	38	25	30
4	46	53	36	42	42	49	33	38	43	52	32	38
6	57	66	44	51	54	63	42	49	54	65	41	49
10	75	87	59	68	72	84	56	65	72	86	56	67
16	94	109	75	87	92	107	71	82	92	110	72	86
25	125	145	97	113	120	139	93	108	125	150	99	119
35	150	174	120	139	140	162	110	128	155	186	120	144
50	180	209	145	168	165	191	130	151	190	228	150	180
70	220	255	170	197	200	232	155	180	235	282	185	222
95	265	307	205	238	230	267	180	209	275	330	215	258
120	300	348	230	267	255	296	200	232	310	372	240	288
150	340	394	265	307	280	325	220	255	345	414	270	324
185	380	441	300	348	305	354	240	278	390	468	305	366
240	420	487	335	389	340	394	270	313	445	534	350	420
300	465	539	370	429	370	429	295	342	500	600	395	474
400	500	580	410	476	405	470	335	389	570	684	455	546
500	540	626	435	505	430	499	355	412	610	732	490	588
630	590	684	485	563	465	539	395	458	680	816	560	672
800												
1000												

Note : Normal current ratings are given in standard conditions, if site conditions are different, current rating should be multiplied by rating factor as given in page no. 25-27

TABLE 8A- CURRENT RATINGS - XLPE CABLES
THREE SINGLE CORE UNARMOURED / ARMOURED CABLES ACCORDING TO IS 7098-1

Conductor cross sectional Area	Direct in Ground (30°C) Amp.		Direct in Duct (30°C) Amp.		Direct in Air (40°C) Amp.	
	Copper	Aluminium	Copper	Aluminium	Copper	Aluminium
sqmm	XLPE	XLPE	XLPE	XLPE	XLPE	XLPE
1.50	27	20	26	20	22	17
2.50	36	28	35	28	29	23
4	46	36	45	35	41	31
6	58	44	57	42	52	39
10	77	59	76	59	71	53
16	99	76	97	75	96	73
25	127	97	127	95	126	99
35	155	116	149	116	157	122
50	183	139	177	133	196	149
70	221	168	204	162	248	190
95	264	204	240	181	299	235
120	298	231	262	201	357	275
150	334	259	292	224	411	320
185	370	290	315	254	479	370
240	424	340	350	283	569	445
300	470	382	389	317	659	514
400	556	437	466	370	769	605
500	620	500	518	428	877	704
630	695	565	555	464	1013	822
800	758	629	637	542	1148	940
1000	834	704	702	606	1275	1070

Note : Normal current ratings are given in standard conditions, if site conditions are different, current rating should be multiplied by rating factor as given in page no. 25-27

TABLE 8B- CURRENT RATINGS - PVC/HR PVC CABLES
THREE SINGLE CORE UNARMOURED / ARMOURED CABLES ACCORDING TO IS 1554-1

Conductor cross sectional Area	Direct in Ground (30°C) Amp.				In Duct (30°C) Amp.				In Air (40°C) Amp.			
	Copper		Aluminium		Copper		Aluminium		Copper		Aluminium	
sqmm	"A" PVC	"C" HR PVC	"A" PVC	"C" HR PVC	"A" PVC	"C" HR PVC	"A" PVC	"C" HR PVC	"A" PVC	"C" HR PVC	"A" PVC	"C" HR PVC
1.50	22	26	17	20	21	24	17	20	20	24	15	18
2.50	30	35	24	28	29	34	24	28	27	32	21	25
4	39	45	31	36	38	44	30	35	35	42	27	32
6	49	57	39	45	48	56	37	43	44	53	35	42
10	65	75	51	59	64	74	51	59	60	72	47	56
16	85	99	66	77	83	96	65	75	82	98	64	77
25	110	128	86	100	110	128	84	97	110	132	84	101
35	130	151	100	116	125	145	100	116	130	156	105	126
50	155	180	120	139	150	174	115	133	165	198	130	156
70	190	220	140	162	175	203	135	157	205	246	155	186
95	220	255	175	203	200	232	155	180	245	294	190	228
120	250	290	195	226	220	255	170	197	280	336	220	264
150	280	325	220	255	245	284	190	220	320	384	250	300
185	305	354	240	278	260	302	210	244	370	444	290	348
240	345	400	270	313	285	331	225	261	425	510	335	402
300	375	435	295	342	310	360	245	284	475	570	380	456
400	400	464	325	377	335	389	275	319	550	660	435	522
500	425	493	345	400	355	412	295	342	590	708	480	576
630	470	545	390	452	375	435	320	371	660	792	550	660
800												
1000												

Note : Normal current ratings are given in standard conditions, if site conditions are different, current rating should be multiplied by rating factor as given in page no. 25-27

TABLE 9A- CURRENT RATINGS - XLPE CABLES
TWO CORES UNARMOURED / ARMOURED CABLES ACCORDING TO IS 7098-1

Conductor cross sectional Area	Direct in Ground (30°C) Amp.		Direct in Duct (30°C) Amp.		Direct in Air (40°C) Amp.	
	Copper	Aluminium	Copper	Aluminium	Copper	Aluminium
sqmm	XLPE	XLPE	XLPE	XLPE	XLPE	XLPE
1.50	33	25	29	22	29	23
2.50	43	34	36	29	39	31
4	54	42	46	35	48	36
6	66	54	58	46	59	47
10	90	70	75	57	82	62
16	114	90	95	75	113	79
25	147	117	124	99	148	108
35	177	140	152	117	186	143
50	210	168	185	143	221	173
70	260	202	228	177	278	212
95	309	243	277	217	338	257
120	351	273	300	247	402	295
150	392	310	341	271	461	342
185	448	350	384	305	527	395
240	509	401	434	345	607	465
300	579	458	495	393	688	532
400	638	505	553	453	818	622
500						
630						
800						
1000						

Note : Normal current ratings are given in standard conditions, if site conditions are different,current rating should be multiplied by rating factor as given in page no. 25-27

TABLE 9B- CURRENT RATINGS - PVC/HR PVC CABLES
TWO CORES UNARMOURED / ARMOURED CABLES ACCORDING TO IS 1554-1

Conductor cross sectional Area	Direct in Ground (30°C) Amp.				In Duct (30°C) Amp.				In Air (40°C) Amp.			
	Copper		Aluminium		Copper		Aluminium		Copper		Aluminium	
sqmm	"A" PVC	"C" HR PVC	"A" PVC	"C" HR PVC	"A" PVC	"C" HR PVC	"A" PVC	"C" HR PVC	"A" PVC	"C" HR PVC	"A" PVC	"C" HR PVC
1.50	23	27	18	21	20	23	16	19	20	24	16	19
2.50	32	37	25	29	27	31	21	24	27	32	21	25
4	41	48	32	37	35	41	27	31	35	42	27	32
6	50	58	40	46	44	51	34	39	45	54	35	42
10	70	81	55	64	58	67	45	52	60	72	47	56
16	90	104	70	81	75	87	58	67	78	94	59	71
25	115	133	90	104	97	113	76	88	105	126	78	94
35	140	162	110	128	120	139	92	107	125	150	99	119
50	165	191	135	157	145	168	115	133	155	186	125	150
70	205	238	160	186	180	209	140	162	195	234	150	180
95	240	278	190	220	215	249	170	197	230	276	185	222
120	275	319	210	244	235	273	190	220	265	318	210	252
150	310	360	240	278	270	313	210	244	305	366	240	288
185	350	406	275	319	300	348	240	278	350	420	275	330
240	405	470	320	371	345	400	275	319	410	492	325	390
300	450	522	355	412	385	447	305	354	465	558	365	438
400	490	568	385	447	425	493	345	400	530	636	420	504
500												
630												
800												
1000												

Note : Normal current ratings are given in standard conditions, if site conditions are different,current rating should be multiplied by rating factor as given in page no 25-27

TABLE 10A- CURRENT RATINGS - XLPE CABLES

3,3.5,4,5 CORES UNARMOURED / ARMOURED CABLES ACCORDING TO IS 7098-1

Conductor cross sectional Area	Direct in Ground (30°C) Amp.		Direct in Duct (30°C) Amp.		Direct in Air (40°C) Amp.	
	Copper	Aluminium	Copper	Aluminium	Copper	Aluminium
sqmm	XLPE	XLPE	XLPE	XLPE	XLPE	XLPE
1.50	25	20	22	18	22	18
2.50	34	27	28	23	28	23
4	44	34	37	28	38	31
6	55	43	46	37	51	45
10	72	57	60	48	66	60
16	95	73	79	61	85	70
25	122	96	100	80	122	95
35	146	115	120	96	148	117
50	175	134	151	116	181	141
70	212	165	182	141	230	177
95	253	198	211	168	284	221
120	290	225	236	189	330	257
150	325	252	271	210	375	293
185	362	285	308	243	431	338
240	418	330	357	282	512	401
300	467	371	406	316	582	459
400	518	423	439	366	661	536
500	583	474	512	412	765	620
630	645	532	570	463	860	715
800						
1000						

Note : Normal current ratings are given in standard conditions, if site conditions are different, current rating should be multiplied by rating factor as given in page no. 25-27

TABLE 10B- CURRENT RATINGS - PVC/HR PVC CABLES

3,3.5,4,5 CORES UNARMOURED / ARMOURED CABLES ACCORDING TO IS 1554-1

Conductor cross sectional Area	Direct in Ground (30°C) Amp.				In Duct (30°C) Amp.				In Air (40°C) Amp.			
	Copper		Aluminium		Copper		Aluminium		Copper		Aluminium	
sqmm	"A" PVC	"C" HR PVC	"A" PVC	"C" HR PVC	"A" PVC	"C" HR PVC	"A" PVC	"C" HR PVC	"A" PVC	"C" HR PVC	"A" PVC	"C" HR PVC
1.50	21	24	16	19	17	20	14	16	17	20	13	16
2.50	27	31	21	24	24	28	18	21	24	29	18	22
4	36	42	28	32	30	35	23	27	30	36	23	28
6	45	52	35	41	38	44	30	35	39	47	30	36
10	60	70	46	53	50	58	39	45	52	62	40	48
16	77	89	60	70	64	74	50	58	66	79	51	61
25	99	115	76	88	81	94	63	73	90	108	70	84
35	120	139	92	107	99	115	77	89	110	132	86	103
50	145	168	110	128	125	145	95	110	135	162	105	126
70	175	203	135	157	150	174	115	133	165	198	130	156
95	210	244	165	191	175	203	140	162	200	240	155	186
120	240	278	185	215	195	226	155	180	230	276	180	216
150	270	313	210	244	225	261	175	203	265	318	205	246
185	300	348	235	273	255	296	200	232	305	366	240	288
240	345	400	275	319	295	342	235	273	355	426	280	336
300	385	447	305	354	335	389	260	302	400	480	315	378
400	425	493	335	389	360	418	290	336	455	546	375	450
500												
630												
800												
1000												

Note : Normal current ratings are given in standard conditions, if site conditions are different, current rating should be multiplied by rating factor as given in page no. 25-27

TABLE 11A THICKNESSES - XLPE CABLES

INSULATION, INNERSHEATH, OUTERSHEATH THICKNESSES OF XLPE INSULATED CABLES ACCORDING TO IS 7098-1

Conductor cross sectional Area	Nominal Insulation Thickness		Minimum Innersheath Thickness				Minimum Outersheath Thickness (Flat strip armoured cable)					Minimum Outersheath Thickness (Round wire armoured cable)					Nominal Outersheath Thickness (Unarmoured cable)				
	Single Core Armoured	Multicore & Single Core Unarmoured	2 Core	3 Core	3.5 Core	4 Core	1 Core	2 Core	3 Core	3.5 Core	4 Core	1 Core	2 Core	3 Core	3.5 Core	4 Core	1 Core	2 Core	3 Core	3.5 Core	4 Core
sqmm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
1.50	-	0.70	0.30	0.30	-	0.30	-	-	-	-	-	-	1.24	1.24	-	1.24	1.80	1.80	1.80	-	1.80
2.50	-	0.70	0.30	0.30	-	0.30	-	-	-	-	-	-	1.24	1.24	-	1.24	1.80	1.80	1.80	-	1.80
4	-	0.70	0.30	0.30	-	0.30	-	-	-	-	-	-	1.24	1.24	-	1.24	1.80	1.80	1.80	-	1.80
6	-	0.70	0.30	0.30	-	0.30	-	-	-	-	-	-	1.24	1.24	-	1.24	1.80	1.80	1.80	-	1.80
10	-	0.70	0.30	0.30	-	0.30	-	-	-	-	-	-	1.24	1.24	-	1.40	1.80	1.80	1.80	-	1.80
16	1.00	0.70	0.30	0.30	-	0.30	-	-	1.24	-	1.40	1.24	1.40	1.40	-	1.40	1.80	1.80	1.80	-	1.80
25	1.20	0.90	0.30	0.30	0.30	0.30	-	1.40	1.40	1.40	1.40	1.24	1.40	1.40	1.40	1.40	1.80	2.00	2.00	2.00	2.00
35	1.20	0.90	0.30	0.30	0.30	0.30	-	1.40	1.40	1.40	1.40	1.24	1.40	1.40	1.40	1.40	1.80	2.00	2.00	2.00	2.00
50	1.30	1.00	0.30	0.30	0.30	0.30	-	1.40	1.40	1.40	1.56	1.24	1.40	1.56	1.56	1.56	1.80	2.00	2.00	2.00	2.00
70	1.40	1.10	0.30	0.40	0.40	0.40	-	1.56	1.56	1.56	1.56	1.24	1.56	1.56	1.56	1.56	1.80	2.00	2.20	2.20	2.20
95	1.40	1.10	0.40	0.40	0.40	0.40	1.40	1.56	1.56	1.56	1.56	1.40	1.56	1.56	1.56	1.72	1.80	2.20	2.20	2.20	2.20
120	1.50	1.20	0.40	0.40	0.40	0.50	1.40	1.56	1.56	1.72	1.72	1.40	1.56	1.72	1.72	1.88	1.80	2.20	2.20	2.20	2.40
150	1.70	1.40	0.40	0.50	0.50	0.50	1.40	1.72	1.72	1.72	1.88	1.40	1.72	1.88	1.88	2.04	2.00	2.20	2.40	2.40	2.60
185	1.90	1.60	0.50	0.50	0.50	0.50	1.40	1.72	1.88	1.88	2.04	1.40	1.88	2.04	2.04	2.20	2.00	2.40	2.60	2.60	2.80
240	2.00	1.70	0.50	0.60	0.60	0.60	1.40	1.88	2.04	2.04	2.20	1.40	2.04	2.20	2.20	2.36	2.00	2.60	2.80	2.80	3.00
300	2.10	1.80	0.60	0.60	0.60	0.70	1.56	2.04	2.20	2.20	2.36	1.56	2.20	2.36	2.36	2.52	2.00	2.80	3.00	3.00	3.20
400	2.40	2.00	0.60	0.70	0.70	0.70	1.56	2.36	2.52	2.52	2.68	1.56	2.36	2.68	2.68	2.84	2.20	3.00	3.20	3.40	3.60
500	2.60	2.20	0.70	0.70	0.70	0.70	1.56	2.52	2.68	2.68	2.84	1.56	2.68	2.84	2.84	3.00	2.20	3.40	3.60	3.60	3.80
630	2.80	2.40	0.70	0.70	0.70	0.70	1.72	2.68	2.84	3.00	3.00	1.72	2.84	3.00	3.00	3.00	2.20	3.60	3.80	4.00	4.00
800	3.10	2.60	-	-	-	-	1.72	-	-	-	-	1.88	-	-	-	-	2.40	-	-	-	-
1000	3.30	2.80	-	-	-	-	1.88	-	-	-	-	2.04	-	-	-	-	2.60	-	-	-	-

TABLE 11B THICKNESSES - PVC/HR PVC CABLES

INSULATION, INNERSHEATH, OUTERSHEATH THICKNESSES OF PVC/HR PVC INSULATED CABLES ACCORDING TO IS 1554-1

Conductor cross sectional Area	Nominal Insulation Thickness		Minimum Innersheath Thickness				Minimum Outersheath Thickness (Flat strip armoured cable)					Minimum Outersheath Thickness (Round wire armoured cable)					Nominal Outersheath Thickness (Unarmoured cable)				
	Single Core Armoured	Multicore & Single Core Unarmoured	2 Core	3 Core	3.5 Core	4 Core	1 Core	2 Core	3 Core	3.5 Core	4 Core	1 Core	2 Core	3 Core	3.5 Core	4 Core	1 Core	2 Core	3 Core	3.5 Core	4 Core
sqmm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
1.50	-	0.80	0.30	0.30	0.30	0.30	-	-	-	-	-	-	1.24	1.24	-	1.24	1.80	1.80	1.80	-	1.80
2.50	-	0.90	0.30	0.30	0.30	0.30	-	-	-	-	-	-	1.24	1.24	-	1.24	1.80	1.80	1.80	-	1.80
4	-	1.00	0.30	0.30	0.30	0.30	-	-	-	-	-	-	1.24	1.24	-	1.24	1.80	1.80	1.80	-	1.80
6	-	1.00	0.30	0.30	0.30	0.30	-	-	-	-	-	-	1.24	1.24	-	1.24	1.80	1.80	1.80	-	1.80
10	-	1.00	0.30	0.30	0.30	0.30	-	-	-	-	1.40	-	1.24	1.40	-	1.40	1.80	1.80	1.80	-	1.80
16	-	1.00	0.30	0.30	0.30	0.30	-	1.40	1.40	-	1.40	-	1.40	1.40	-	1.40	1.80	1.80	1.80	-	2.00
25	1.50	1.20	0.30	0.30	0.30	0.30	1.24	1.40	1.40	1.40	1.40	1.24	1.40	1.40	1.40	1.40	1.80	2.00	2.00	2.00	2.00
35	1.50	1.20	0.30	0.30	0.30	0.30	1.24	1.40	1.40	1.40	1.40	1.24	1.40	1.40	1.40	1.56	1.80	2.00	2.00	2.00	2.00
50	1.70	1.40	0.30	0.30	0.30	0.40	1.24	1.40	1.56	1.56	1.56	1.24	1.56	1.56	1.56	1.56	1.80	2.00	2.00	2.00	2.20
70	1.70	1.40	0.30	0.40	0.40	0.40	1.24	1.56	1.56	1.56	1.56	1.40	1.56	1.56	1.56	1.56	1.80	2.00	2.20	2.20	2.20
95	1.90	1.60	0.40	0.40	0.40	0.40	1.40	1.56	1.56	1.56	1.72	1.40	1.56	1.72	1.72	1.72	1.80	2.20	2.20	2.20	2.40
120	1.90	1.60	0.40	0.40	0.50	0.50	1.40	1.56	1.72	1.72	1.88	1.40	1.72	1.72	1.88	1.88	2.00	2.20	2.20	2.40	2.40
150	2.10	1.80	0.40	0.50	0.50	0.50	1.40	1.72	1.88	1.88	1.88	1.40	1.72	1.88	1.88	2.04	2.00	2.40	2.40	2.40	2.60
185	2.30	2.00	0.50	0.50	0.50	0.60	1.40	1.88	1.88	2.04	2.04	1.40	1.88	2.04	2.04	2.20	2.00	2.40	2.60	2.60	2.80
240	2.50	2.20	0.50	0.60	0.60	0.60	1.40	2.04	2.20	2.20	2.36	1.56	2.04	2.20	2.36	2.36	2.00	2.60	2.80	3.00	3.00
300	2.70	2.40	0.60	0.60	0.60	0.70	1.56	2.20	2.36	2.36	2.52	1.56	2.20	2.36	2.52	2.68	2.00	2.80	3.00	3.20	3.40
400	3.00	2.60	0.70	0.70	0.70	0.70	1.56	2.36	2.52	2.68	2.84	1.56	2.52	2.68	2.68	2.84	2.20	3.20	3.40	3.40	3.60
500	3.40	3.00	0.70	0.70	0.70	0.70	1.56	2.68	2.84	2.84	3.00	1.72	2.84	3.00	3.00	3.00	2.20	3.40	3.60	3.80	4.00
630	3.90	3.40	0.70	0.70	0.70	0.70	1.72	2.84	3.00	3.00	3.00	1.88	3.00	3.00	3.00	3.00	2.40	3.80	4.00	4.00	4.00
800	3.90	3.40	-	-	-	-	1.88	-	-	-	-	1.88	-	-	-	-	2.40	-	-	-	-
1000	3.90	3.40	-	-	-	-	2.04	-	-	-	-	2.04	-	-	-	-	2.60	-	-	-	-

TABLE 12A - OVERALL DIAMETER (OD) - XLPE CABLES

OVERALL DIAMETER OF XLPE INSULATED CABLES ACCORDING TO IS 7098-1

Conductor cross sectional Area	Approximate O.D. (+/-2 mm) - Unarmoured					Approximate O.D. (+/-2 mm) - Flat strip armoured					Approximate O.D. (+/-2 mm) - Round wire armoured					Nominal Diameter of Round wire armour				
	1Core	2Core	3Core	3.5Core	4Core	1Core	2Core	3Core	3.5Core	4Core	1Core	2Core	3Core	3.5Core	4Core	1Core	2Core	3Core	3.5Core	4Core
sqmm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
1.50	7.0	12	12	-	13	-	-	-	-	-	-	13	14	-	15	-	1.40	1.40	-	1.40
2.50	7.5	12	13	-	14	-	-	-	-	-	-	14	15	-	16	-	1.40	1.40	-	1.40
4	8.0	14	14	-	15	-	-	-	-	-	-	15	16	-	17	-	1.40	1.40	-	1.40
6	9.0	15	15	-	17	-	-	-	-	-	-	16	17	-	18	-	1.40	1.40	-	1.40
10	10	17	17	-	19	-	-	-	-	-	-	18	19	-	21	-	1.40	1.40	-	1.40
16	11	16	17	-	19	-	17	18	-	21	13	18	20	-	22	1.40	1.40	1.60	-	1.60
25	12	19	21	23	23	-	20	22	24	24	14	21	23	25	25	1.40	1.60	1.60	1.60	1.60
35	13	21	23	25	25	-	22	24	26	26	16	23	25	27	27	1.40	1.60	1.60	1.60	1.60
50	14	23	25	28	28	-	24	26	29	30	17	25	28	31	31	1.40	1.60	1.60	1.60	1.60
70	16	26	29	32	33	-	28	30	33	34	19	29	32	35	36	1.40	1.60	2.00	2.00	2.00
95	18	29	32	36	36	20	30	33	37	37	21	32	35	39	39	1.60	2.00	2.00	2.00	2.00
120	20	31	34	38	39	22	32	35	39	40	23	34	37	41	43	1.60	2.00	2.00	2.00	2.00
150	22	34	38	43	44	23	36	39	43	45	25	38	42	46	48	1.60	2.00	2.00	2.00	2.50
185	24	39	43	47	49	25	39	43	48	49	27	42	47	52	53	1.60	2.00	2.50	2.50	2.50
240	26	43	48	53	55	28	44	49	54	55	29	47	52	57	59	1.60	2.50	2.50	2.50	2.50
300	29	48	53	59	60	30	48	53	59	61	32	52	57	63	65	1.60	2.50	2.50	2.50	3.15
400	32	53	59	66	67	34	54	60	66	68	36	57	64	71	73	2.00	2.50	3.15	3.15	3.15
500	36	59	65	73	75	38	60	66	73	75	40	64	71	78	82	2.00	3.15	3.15	3.15	4.00
630	40	66	73	81	83	42	66	73	82	84	44	71	80	89	90	2.00	3.15	4.00	4.00	4.00
800	44	-	-	-	-	46	-	-	-	-	49	-	-	-	-	2.00	-	-	-	-
1000	49	-	-	-	-	51	-	-	-	-	55	-	-	-	-	2.50	-	-	-	-

ABLE 12B - OVERALL DIAMETER (OD) - PVC/HR PVC CABLES

OVERALL DIAMETER OF PVC/HR PVC INSULATED CABLES ACCORDING TO IS 1554-1

Conductor cross sectional Area	Approximate O.D. (+/-2 mm) - Unarmoured					Approximate O.D. (+/-2 mm) - Flat strip armoured					Approximate O.D. (+/-2 mm) - Round wire armoured					Nominal Diameter of Round wire armour				
	1Core	2Core	3Core	3.5Core	4Core	1Core	2Core	3Core	3.5Core	4Core	1Core	2Core	3Core	3.5Core	4Core	1Core	2Core	3Core	3.5Core	4Core
sqmm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
1.50	7.0	12	12	-	13	-	-	-	-	-	-	14	14	-	15	-	1.40	1.40	-	1.40
2.50	8.0	13	14	-	15	-	-	-	-	-	-	15	16	-	17	-	1.40	1.40	-	1.40
4	8.5	15	15	-	17	-	-	-	-	-	-	17	18	-	19	-	1.40	1.40	-	1.40
6	9.0	16	17	-	18	-	-	-	-	-	-	18	19	-	20	-	1.40	1.40	-	1.40
10	10	17	18	-	20	-	-	-	-	22	-	20	21	-	23	-	1.40	1.40	-	1.60
16	11	18	19	-	21	-	19	20	-	22	-	20	21	-	23	-	1.60	1.60	-	1.60
25	13	20	23	25	25	-	21	23	25	26	15	23	24	27	27	1.40	1.60	1.60	1.60	1.60
35	14	22	24	27	27	-	23	25	27	28	16	24	26	29	29	1.40	1.60	1.60	1.60	1.60
50	16	25	28	30	32	-	26	29	32	32	18	28	30	33	34	1.40	1.60	1.60	1.60	2.00
70	17	28	31	33	36	-	29	32	35	35	20	30	34	37	37	1.40	1.60	2.00	2.00	2.00
95	19	32	36	38	41	21	33	36	40	40	22	35	38	42	42	1.60	2.00	2.00	2.00	2.00
120	21	33	37	42	43	23	34	37	42	43	24	36	39	44	45	1.60	2.00	2.00	2.00	2.00
150	23	36	41	45	48	25	37	41	46	47	26	39	43	48	50	1.60	2.00	2.00	2.00	2.50
185	25	40	46	50	53	27	41	45	51	52	28	43	49	54	55	1.60	2.00	2.50	2.50	2.50
240	28	45	52	57	60	29	46	51	57	58	31	49	54	60	61	1.60	2.50	2.50	2.50	2.50
300	30	50	57	63	66	32	51	56	63	64	33	54	59	67	69	1.60	2.50	2.50	3.15	3.15
400	34	56	64	70	74	36	57	62	70	72	38	61	67	74	76	2.00	3.15	3.15	3.15	3.15
500	38	63	71	79	83	40	63	70	78	81	42	68	75	85	87	2.00	3.15	3.15	4.00	4.00
630	43	70	80	89	92	45	71	79	88	90	47	78	85	94	96	2.00	4.00	4.00	4.00	4.00
800	47	-	-	-	-	49	-	-	-	-	51	-	-	-	-	2.00	-	-	-	-
1000	51	-	-	-	-	54	-	-	-	-	56	-	-	-	-	2.50	-	-	-	-

TABLE 13A - WEIGHTS - XLPE CABLES

APPROX NET WEIGHT OF COPPER CONDUCTOR , XLPE INSULATED CABLES ACCORDING TO IS 7098-1

Conductor cross sectional Area	Approximate Net Weight - Unarmoured					Approximate Net Weight - Flat strip armoured					Approximate Net Weight - Round wire armoured				
	1Core	2Core	3Core	3.5Core	4Core	1Core	2Core	3Core	3.5Core	4Core	1Core	2Core	3Core	3.5Core	4Core
sqmm	kg/km	kg/km	kg/km	kg/km	kg/km	kg/km	kg/km	kg/km	kg/km	kg/km	kg/km	kg/km	kg/km	kg/km	kg/km
1.5	64	163	183	-	213	-	-	-	-	-	-	357	389	-	431
2.5	77	198	227	-	269	-	-	-	-	-	-	403	445	-	510
4	96	249	292	-	350	-	-	-	-	-	-	478	546	-	628
6	120	312	374	-	454	-	-	-	-	-	-	578	651	-	768
10	168	436	534	-	658	-	-	-	-	-	-	750	859	-	1039
16	231	448	607	-	775	-	-	779	-	983	310	766	1008	-	1224
25	313	669	919	1095	1180	-	860	1130	1350	1434	403	1100	1381	1621	1721
35	410	868	1210	1390	1563	-	1079	1441	1664	1837	509	1347	1735	1979	2167
50	540	1139	1604	1871	2083	-	1393	1878	2187	2423	651	1681	2232	2580	2792
70	737	1542	2221	2586	2892	-	1861	2557	2963	3267	858	2186	3102	3593	3898
95	995	2098	3002	3495	3926	1078	2433	3379	3910	4365	1174	3005	4009	4626	5090
120	1228	2561	3687	4360	4909	1318	2915	4083	4852	5361	1424	3517	4775	5601	6173
150	1502	3095	4542	5230	5996	1578	3520	4997	5746	6505	1695	4208	5781	6621	7783
185	1852	3884	5648	6594	7457	1943	4338	6136	7167	8023	2067	5123	7394	8541	9441
240	2392	5038	7388	8575	9752	2487	5550	7956	9200	10392	2628	6784	9371	10798	12012
300	2953	6285	9157	10605	12091	3087	6854	9779	11306	12806	3242	8229	11297	13024	15249
400	3779	7969	11632	13501	15435	3924	8635	12353	14263	16233	4181	10148	14780	16973	18966
500	4791	10159	14839	17198	19605	4949	10822	15571	18051	20467	5237	13249	18243	21047	24720
630	6118	12970	18984	21999	25099	6323	13725	19803	23040	26185	6654	16374	23991	27558	30763
800	7817	-				8018					8416				
1000	9691	-				9899					10517				

TABLE 13B - WEIGHTS - PVC/HR PVC CABLES

APPROX NET WEIGHT OF PVC/HR PVC INSULATED COPPER CABLES ACCORDING TO IS 1554-1

Conductor cross sectional Area	Approximate Net Weight - Unarmoured					Approximate Net Weight - Flat strip armoured					Approximate Net Weight - Round wire armoured				
	1Core	2Core	3Core	3.5Core	4Core	1Core	2Core	3Core	3.5Core	4Core	1Core	2Core	3Core	3.5Core	4Core
sqmm	kg/km	kg/km	kg/km	kg/km	kg/km	kg/km	kg/km	kg/km	kg/km	kg/km	kg/km	kg/km	kg/km	kg/km	kg/km
1.5	70	184	210	-	246	-	-	-	-	-	-	384	434	-	483
2.5	87	235	272	-	323	-	-	-	-	-	-	471	520	-	596
4	111	305	359	-	433	-	-	-	-	-	-	578	656	-	754
6	138	376	450	-	547	-	-	-	-	-	-	673	772	-	906
10	187	511	625	-	771	-	-	-	-	1055	-	857	1013	-	1263
16	256	507	689	-	901	-	698	902	-	1116	350	898	1112	-	1369
25	352	749	1030	1232	1324	-	965	1267	1513	1605	452	1201	1529	1793	1884
35	454	959	1337	1543	1729	-	1196	1595	1844	2029	564	1458	1882	2167	2377
50	601	1273	1793	2093	2360	-	1553	2141	2487	2722	728	1873	2457	2855	3298
70	801	1685	2428	2832	3163	-	2033	2791	3236	3566	958	2366	3341	3868	4225
95	1088	2311	3304	3854	4361	1299	2646	3707	4321	4846	1290	3273	4398	5100	5593
120	1347	2782	4004	4820	5334	1555	3164	4460	5302	5875	1547	3825	5149	6140	6678
150	1619	3383	4913	5665	6487	1855	3803	5433	6251	7050	1853	4492	6208	7110	8363
185	1998	4191	6095	7132	8097	2249	4685	6637	7781	8716	2250	5485	7890	9167	10166
240	2577	5436	7969	9313	10520	2855	5993	8611	9986	11265	2879	7271	9999	11617	12863
300	3189	6783	9881	11510	13113	3516	7400	10606	12258	13873	3516	8813	12146	14744	16405
400	4066	8640	12590	14545	16625	4417	9282	13306	15422	17538	4512	11493	15755	18153	20289
500	5169	10978	16030	18655	21260	5557	11747	16898	19574	22326	5699	14266	19761	23922	26552
630	6647	14133	20652	23855	27225	7098	14927	21695	25028	28445	7264	18877	25840	29768	33240
800	8347	-				8933					9016				
1000	10260	-				10899					11174				

TABLE 14A - WEIGHTS - XLPE CABLES

APPROX NET WEIGHT OF ALUMIMIUM CONDUCTOR , XLPE INSULATED CABLES ACCORDING TO IS 7098-1

Conductor cross sectional Area	Approximate Net Weight - Unarmoured					Approximate Net Weight - Flat strip armoured					Approximate Nett Weight - Round wire armoured				
	1Core	2Core	3Core	3.5Core	4Core	1Core	2Core	3Core	3.5Core	4Core	1Core	2Core	3Core	3.5Core	4Core
sqmm	kg/km	kg/km	kg/km	kg/km	kg/km	kg/km	kg/km	kg/km	kg/km	kg/km	kg/km	kg/km	kg/km	kg/km	kg/km
1.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	77	219	239	-	277	-	-	-	-	-	-	472	505		578
6	91	265	292	-	341	-	-	-	-	-	-	555	594		678
10	106	311	347	-	409	-	-	-	-	-	-	625	672		789
16	132	264	332	-	408	-	-	503	-	617	211	583	732	-	858
25	168	377	481	566	595	-	568	692	821	850	259	808	943	1091	1137
35	204	453	587	675	733	-	664	818	950	1006	303	932	1113	1264	1337
50	254	561	737	858	927	-	815	1011	1173	1266	365	1103	1365	1567	1636
70	333	726	997	1155	1260	-	1045	1333	1531	1635	454	1370	1879	2162	2267
95	422	940	1265	1468	1609	505	1274	1641	1883	2048	600	1846	2271	2599	2773
120	510	1111	1512	1777	2009	601	1465	1908	2269	2461	707	2067	2600	3018	3273
150	631	1335	1903	2183	2478	707	1761	2358	2699	2986	824	2449	3142	3574	4264
185	765	1688	2355	2722	3066	856	2143	2843	3294	3631	980	2927	4100	4668	5050
240	945	2116	3005	3467	3908	1040	2628	3574	4093	4548	1181	3862	4989	5690	6168
300	1143	2630	3674	4242	4780	1277	3199	4296	4944	5495	1432	4573	5814	6662	7938
400	1461	3287	4609	5380	6071	1606	3953	5330	6142	6869	1863	5466	7756	8852	9602
500	1817	4152	5827	6726	7590	1975	4814	6560	7579	8452	2263	7241	9232	10575	12705
630	2269	5196	7324	8511	9552	2475	5951	8143	9552	10638	2806	8601	12331	14071	15216
800	2878					3079					3477				
1000	3592					3800					4418				

TABLE 14B - WEIGHTS - PVC/HR PVC CABLES

APPROX NET WEIGHT OF PVC/HR PVC INSULATED ALUMINIUM CABLES ACCORDING TO IS 1554-1

Conductor cross sectional Area	Approximate Net Weight - Unarmoured					Approximate Net Weight - Flat strip armoured					Approximate Net Weight - Round wire armoured				
	1Core	2Core	3Core	3.5Core	4Core	1Core	2Core	3Core	3.5Core	4Core	1Core	2Core	3Core	3.5Core	4Core
sqmm	kg/km	kg/km	kg/km	kg/km	kg/km	kg/km	kg/km	kg/km	kg/km	kg/km	kg/km	kg/km	kg/km	kg/km	kg/km
1.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	90	259	288	-	337	-	-	-	-	-	-	529	583	-	652
6	105	310	347	-	409	-	-	-	-	-	-	601	664	-	757
10	128	382	432	-	515	-	-	-	-	793	-	730	833	-	1001
16	157	320	408	-	527	-	511	622	-	742	250	711	831	-	994
25	204	451	583	691	728	-	667	820	973	1008	305	903	1082	1252	1288
35	245	536	702	814	882	-	773	959	1115	1182	354	1034	1247	1438	1530
50	309	683	908	1059	1180	-	963	1256	1452	1542	436	1283	1572	1820	2118
70	389	853	1179	1372	1498	-	1201	1543	1776	1901	546	1534	2092	2408	2560
95	503	1129	1531	1786	1997	647	1464	1934	2253	2482	705	2091	2625	3032	3229
120	615	1303	1785	2185	2375	751	1684	2241	2667	2916	815	2346	2929	3504	3719
150	730	1588	2220	2556	2897	889	2008	2740	3142	3460	964	2696	3515	4001	4772
185	889	1950	2734	3180	3615	1061	2444	3276	3829	4235	1141	3244	4529	5215	5685
240	1101	2454	3497	4101	4557	1289	3012	4139	4774	5302	1403	4289	5527	6405	6900
300	1342	3053	4286	5018	5653	1571	3670	5011	5765	6413	1669	5083	6551	8252	8945
400	1701	3862	5423	6258	7069	1943	4504	6139	7135	7983	2147	6715	8588	9866	10734
500	2134	4848	6835	7969	9000	2402	5617	7703	8888	10065	2664	8136	10566	13236	14292
630	2720	6201	8754	10091	11361	3037	6995	9797	11265	12580	3337	10945	13942	16005	17376
800	3307					3697					3976				
1000	4037					4462					4951				

TABLE 15A - CONTROL CABLES - XLPE

1.5 sq.mm MULTICORE CONTROL XLPE INSULATED CABLES ACCORDING TO IS 7098-1

Number of Cores	Minimum Inner sheath Thickness	Minimum Outersheath Thickness		Nominal Outersheath Thickness	Round wire Diameter	Approximate Overall Diameter			Net Weight of Cable			Current Ratings			Standard Drum Length
		Round wire armoured	Flat strip armoured	Unarmoured		Round wire armoured	Flat strip armoured	Unarmoured	Round wire armoured	Flat strip armoured	Unarmoured	In Ground (30°)	In Duct (30°C)	In Air (40°C)	
	mm	mm	mm	mm	mm	mm	mm	mm	kg/km	kg/km	kg/km	Amps	Amps	Amps	mtrs
2	0.30	1.24	-	1.80	1.40	13	-	12	357	-	163	33	29	29	1000
3	0.30	1.24	-	1.80	1.40	14	-	12	389	-	183	25	20	22	1000
4	0.30	1.24	-	1.80	1.40	15	-	13	431	-	213	25	20	22	1000
5	0.30	1.24	-	1.80	1.40	16	-	14	499	-	230	25	20	22	1000
6	0.30	1.24	-	1.80	1.40	16	-	15	564	-	266	22	19	19	1000
7	0.30	1.24	-	1.80	1.40	16	-	15	577	-	274	21	20	18	1000
8	0.30	1.24	-	1.80	1.40	17	-	16	636	-	309	20	17	18	1000
9	0.30	1.24	-	1.80	1.40	18	-	17	702	-	345	19	16	17	1000
10	0.30	1.24	-	1.80	1.40	20	-	18	759	-	368	18	15	16	1000
12	0.30	1.24	-	1.80	1.40	20	-	18	826	-	412	17	14	15	1000
14	0.30	1.40	-	1.80	1.40	21	-	19	931	-	462	16	13	14	1000
16	0.30	1.40	1.40	1.80	1.60	23	21	20	1083	833	515	16	13	14	1000
19	0.30	1.40	1.40	1.80	1.60	23	22	21	1179	911	577	15	12	13	1000
24	0.30	1.40	1.40	2.00	1.60	27	25	24	1436	1139	733	13	11	12	1000
27	0.30	1.40	1.40	2.00	1.60	27	26	25	1532	1218	797	13	11	11	1000
30	0.30	1.40	1.40	2.00	1.60	28	27	26	1634	1327	867	12	10	11	1000
33	0.30	1.40	1.40	2.00	1.60	29	27	27	1755	1413	940	12	9	10	1000
37	0.30	1.40	1.40	2.00	1.60	30	28	27	1891	1540	1023	11	9	10	1000
44	0.30	1.56	1.40	2.00	1.60	33	31	31	2209	1794	1197	11	8	9	1000
48	0.30	1.56	1.40	2.00	1.60	34	32	31	2330	1897	1280	11	8	9	1000
52	0.30	1.56	1.56	2.00	1.60	34	33	32	2457	2058	1367	10	8	9	1000
56	0.30	1.56	1.56	2.00	1.60	35	34	33	2603	2170	1461	10	8	9	1000
61	0.40	1.56	1.56	2.20	2.00	37	35	34	2983	2322	1596	9	8	8	1000

Note : Normal current ratings are given in standard conditions, if site conditions are different, current rating should be multiplied by rating factor as given in page no. 25-27

TABLE 15B - CONTROL CABLES - PVC/HR PVC

1.5 sq.mm MULTICORE CONTROL PVC/HR PVC INSULATED CABLES ACCORDING TO IS 1554-1

Number of Cores	Minimum Innersheath Thickness	Minimum Outer sheath Thickness		Nominal Outer sheath Thickness	Round wire Diameter	Approximate Overall Diameter			Net Weight of Cable			Current Ratings (TYPE "A" 70°C PVC)			Current Ratings (TYPE "C" HR 85°C PVC)			Standard Drum Length
		Round wire armoured	Flat strip armoured	Unarmoured		Round wire armoured	Flat strip armoured	Unarmoured	Round wire armoured	Flat strip armoured	Unarmoured	In Ground (30°C)	In Duct (30°C)	In Air (40°C)	In Ground (30°C)	In Duct (30°C)	In Air (40°C)	
	mm	mm	mm	mm	mm	mm	mm	mm	kg/km	kg/km	kg/km	Amps	Amps	Amps	Amps	Amps	Amps	mtrs
2	0.30	1.24	-	1.80	1.40	14	-	12	384	-	184	23	20	20	27	23	24	1000
3	0.30	1.24	-	1.80	1.40	14	-	12	434	-	210	21	17	17	24	20	20	1000
4	0.30	1.24	-	1.80	1.40	15	-	13	483	-	246	21	17	17	24	20	20	1000
5	0.30	1.24	-	1.80	1.40	16	-	15	530	-	279	21	17	17	24	20	20	1000
6	0.30	1.24	-	1.80	1.40	17	-	16	597	-	323	15	13	13	17	16	16	1000
7	0.30	1.24	-	1.80	1.40	17	-	16	609	-	334	14	13	13	16	16	16	1000
8	0.30	1.24	-	1.80	1.40	18	-	17	672	-	373	14	12	12	16	14	14	1000
9	0.30	1.24	-	1.80	1.40	19	-	18	740	-	418	13	12	12	15	14	14	1000
10	0.30	1.40	-	1.80	1.40	21	-	19	827	-	451	13	11	11	15	13	13	1000
12	0.30	1.40	1.24	1.80	1.60	22	20	19	953	690	507	12	10	10	14	12	12	1000
14	0.30	1.40	1.40	1.80	1.60	23	21	20	1048	793	570	11	10	10	13	12	12	1000
16	0.30	1.40	1.40	1.80	1.60	24	22	21	1147	882	636	11	9	9	13	11	11	1000
18	0.30	1.40	1.40	1.80	1.60	24	22	21	1197	931	685	10	9	9	12	11	11	1000
19	0.30	1.40	1.40	2.00	1.60	25	23	23	1243	960	740	10	9	9	12	11	11	1000
20	0.30	1.40	1.40	2.00	1.60	26	24	24	1315	1021	780	10	8	8	11	10	10	1000
24	0.30	1.40	1.40	2.00	1.60	28	27	26	1507	1194	910	9	8	8	11	10	10	1000
25	0.30	1.40	1.40	2.00	1.60	28	27	26	1532	1219	935	9	8	8	10	9	9	1000
27	0.30	1.40	1.40	2.00	1.60	28	27	26	1605	1274	991	9	8	8	10	9	9	1000
29	0.30	1.40	1.40	2.00	1.60	29	28	27	1697	1332	1052	9	7	7	10	8	8	1000
30	0.30	1.40	1.40	2.00	1.60	29	28	27	1725	1359	1080	9	7	7	10	8	8	1000
32	0.30	1.40	1.40	2.00	1.60	30	29	28	1802	1444	1142	9	7	7	10	8	8	1000
33	0.30	1.40	1.40	2.00	1.60	30	29	28	1832	1473	1172	8	7	7	9	8	8	1000
34	0.30	1.40	1.40	2.00	1.60	31	30	29	1902	1533	1210	8	7	7	9	8	8	1000
35	0.30	1.40	1.40	2.00	1.60	31	30	29	1927	1558	1235	8	7	7	9	8	8	1000
36	0.30	1.40	1.40	2.00	1.60	31	30	29	1951	1583	1260	8	7	7	9	8	8	1000
37	0.30	1.40	1.40	2.00	1.60	31	30	29	1969	1601	1278	8	7	7	9	8	8	1000
40	0.30	1.56	1.40	2.00	1.60	33	31	30	2118	1712	1367	8	7	7	9	8	8	1000
42	0.30	1.56	1.56	2.00	1.60	31	30	29	2120	1750	1401	8	6	6	8	8	8	1000
44	0.30	1.56	1.56	2.00	1.60	35	34	33	2313	1888	1497	8	6	6	8	8	8	1000
48	0.30	1.56	1.56	2.00	1.60	35	34	33	2435	1993	1603	7	6	6	8	7	7	1000
52	0.40	1.56	1.56	2.20	2.00	37	35	34	2803	2129	1753	7	6	6	8	7	7	1000
54	0.40	1.56	1.56	2.20	2.00	37	35	34	2853	2179	1803	7	6	6	8	7	7	1000
56	0.40	1.56	1.56	2.20	2.00	38	36	35	2971	2269	1871	7	6	6	8	7	7	1000
61	0.40	1.56	1.56	2.20	2.00	39	37	36	3127	2397	2003	7	6	6	8	7	7	1000

Note : Normal current ratings are given in standard conditions, if site conditions are different, current rating should be multiplied by rating factor as given in page no. 25-27

TABLE 16A - CONTROL CABLES - XLPE CABLES

2.5 sq.mm MULTICORE CONTROL XLPE INSULATED CABLES ACCORDING TO IS 7098-1

Number of Cores	Minimum Inner sheath Thickness	Minimum Outersheath Thickness		Nominal Outer sheath Thickness	Round wire Diameter	Approximate Overall Diameter			Net Weight of Cable			Current Ratings			Standard Drum Length
		Round wire armoured	Flat strip armoured	Unarmoured		Round wire armoured	Flat strip armoured	Unarmoured	Round wire armoured	Flat strip armoured	Unarmoured	In Ground (30°C)	In Duct (30°C)	In Air (40°C)	
	mm	mm	mm	mm	mm	mm	mm	mm	kg/km	kg/km	kg/km	Amps	Amps	Amps	mtrs
2	0.30	1.24	-	1.80	1.40	14	-	12	403	-	198	43	37	39	1000
3	0.30	1.24	-	1.80	1.40	15	-	13	445	-	227	34	28	30	1000
4	0.30	1.24	-	1.80	1.40	16	-	14	510	-	269	34	28	30	1000
5	0.30	1.24	-	1.80	1.40	17	-	15	558	-	292	34	28	30	1000
6	0.30	1.24	-	1.80	1.40	18	-	16	645	-	342	29	24	26	1000
7	0.30	1.24	-	1.80	1.40	18	-	16	656	-	355	27	23	25	1000
8	0.30	1.24	-	1.80	1.40	19	-	17	728	-	402	26	22	24	1000
9	0.30	1.40	-	1.80	1.40	20	-	18	820	-	452	25	21	22	1000
10	0.30	1.40	1.24	1.80	1.60	22	20	19	948	696	482	24	20	21	1000
12	0.30	1.40	1.40	1.80	1.60	23	21	20	1028	778	546	22	19	20	1000
14	0.30	1.40	1.40	1.80	1.60	24	22	21	1131	872	617	21	18	19	1000
16	0.30	1.40	1.40	2.00	1.60	24	23	22	1222	944	712	20	17	18	1000
19	0.30	1.40	1.40	2.00	1.60	26	24	23	1345	1058	804	19	16	17	1000
24	0.30	1.40	1.40	2.00	1.60	29	28	27	1644	1286	992	17	15	16	1000
27	0.30	1.40	1.40	2.00	1.60	30	28	27	1753	1403	1085	16	15	16	1000
30	0.30	1.40	1.40	2.00	1.60	31	29	28	1869	1500	1185	16	13	14	1000
33	0.30	1.56	1.40	2.00	1.60	32	30	29	2031	1626	1289	15	13	14	1000
37	0.30	1.56	1.40	2.00	1.60	33	31	30	2184	1768	1409	15	12	13	1000
44	0.40	1.56	1.56	2.20	2.00	37	35	34	2770	2084	1688	14	11	12	1000
48	0.40	1.56	1.56	2.20	2.00	38	36	35	2892	2229	1811	14	11	12	1000
52	0.40	1.56	1.56	2.20	2.00	39	37	36	3072	2356	1940	13	11	12	1000
56	0.40	1.56	1.56	2.20	2.00	40	38	37	3230	2511	2073	13	11	11	1000
61	0.40	1.56	1.56	2.20	2.00	41	39	38	3430	2683	2223	12	10	11	1000

Note : Normal current ratings are given in standard conditions, if site conditions are different, current rating should be multiplied by rating factor as given in page no. 25-27

TABLE 16B - CONTROL CABLES - PVC/HR PVC CABLES

2.5 sq.mm MULTICORE CONTROL PVC/HR PVC INSULATED CABLES ACCORDING TO IS 1554-1

Number of Cores	Minimum Innersheath Thickness	Minimum Outer sheath Thickness		Nominal Outer sheath Thickness	Round wire Diameter	Approximate Overall Diameter			Net Weight of Cable			Current Ratings (TYPE "A" 70°C PVC)			Current Ratings (TYPE "C" HR 85°C PVC)			Standard Drum Length
		Round wire armoured	Flat strip armoured	Unarmoured		Round wire armoured	Flat strip armoured	Unarmoured	Round wire armoured	Flat strip armoured	Un-rmoured	In Ground (30°C)	In Duct (30°C)	In Air (40°C)	In Ground (30°C)	In Duct (30°C)	In Air (40°C)	
	mm	mm	mm	mm	mm	mm	mm	mm	kg/km	kg/km	kg/km	Amps	Amps	Amps	Amps	Amps	Amps	mtrs
2	0.30	1.24	-	1.80	1.40	15	-	13	471	-	235	32	27	27	37	31	32	1000
3	0.30	1.24	-	1.80	1.40	16	-	14	520	-	272	27	24	24	31	28	29	1000
4	0.30	1.24	-	1.80	1.40	17	-	15	596	-	323	27	24	24	31	28	29	1000
5	0.30	1.24	-	1.80	1.40	18	-	16	662	-	363	27	24	24	31	28	29	1000
6	0.30	1.24	-	1.80	1.40	19	-	17	748	-	425	21	18	18	24	22	22	1000
7	0.30	1.24	-	1.80	1.40	19	-	17	765	-	443	20	17	17	23	20	20	1000
8	0.30	1.40	-	1.80	1.40	21	-	19	873	-	497	19	16	16	22	19	19	1000
9	0.30	1.40	1.40	1.80	1.60	22	21	20	1021	783	559	18	15	15	21	18	18	1000
10	0.30	1.40	1.40	1.80	1.60	24	23	21	1115	849	603	18	15	15	21	18	18	1000
12	0.30	1.40	1.40	2.00	1.60	24	23	22	1213	929	709	17	14	14	20	17	17	1000
14	0.30	1.40	1.40	2.00	1.60	25	24	24	1335	1042	800	16	14	14	19	17	17	1000
16	0.30	1.40	1.40	2.00	1.60	26	25	25	1462	1159	895	15	13	13	18	16	16	1000
18	0.30	1.40	1.40	2.00	1.60	26	25	25	1535	1232	969	14	12	12	16	14	14	1000
19	0.30	1.40	1.40	2.00	1.60	28	26	26	1610	1272	1013	14	12	12	16	14	14	1000
20	0.30	1.40	1.40	2.00	1.60	29	28	27	1696	1348	1067	13	11	11	15	13	13	1000
24	0.30	1.56	1.40	2.00	1.60	32	30	30	1986	1573	1251	13	11	11	15	13	13	1000
25	0.30	1.56	1.40	2.00	1.60	32	30	30	2023	1610	1288	13	11	11	15	13	13	1000
27	0.30	1.56	1.40	2.00	1.60	33	31	30	2122	1715	1371	12	10	10	14	12	12	1000
29	0.30	1.56	1.56	2.00	1.60	33	32	31	2241	1827	1458	12	10	10	14	12	12	1000
30	0.30	1.56	1.56	2.00	1.60	34	32	31	2282	1868	1499	12	10	10	14	12	12	1000
32	0.30	1.56	1.56	2.00	1.60	35	33	32	2403	1979	1587	12	10	10	14	12	12	1000
33	0.30	1.56	1.56	2.00	1.60	35	33	32	2446	2022	1630	11	9	9	13	11	11	1000
34	0.40	1.56	1.56	2.20	2.00	37	35	34	2770	2097	1720	11	9	9	13	11	11	1000
35	0.40	1.56	1.56	2.20	2.00	37	35	34	2807	2134	1757	11	9	9	13	11	11	1000
36	0.40	1.56	1.56	2.20	2.00	37	35	34	2844	2171	1794	11	9	9	13	11	11	1000
37	0.40	1.56	1.56	2.20	2.00	37	35	34	2871	2198	1821	11	9	9	13	11	11	1000
40	0.40	1.56	1.56	2.20	2.00	38	36	35	3051	2349	1951	11	9	9	13	11	11	1000
42	0.40	1.56	1.56	2.20	2.00	37	35	34	3055	2382	2005	10	9	9	12	11	11	1000
44	0.40	1.56	1.56	2.20	2.00	41	39	38	3312	2551	2138	10	9	9	12	11	11	1000
48	0.40	1.56	1.56	2.20	2.00	41	39	39	3493	2730	2294	10	9	9	12	11	11	1000
52	0.40	1.56	1.56	2.20	2.00	42	40	40	3710	2918	2460	10	8	8	11	10	10	1000
54	0.40	1.72	1.56	2.20	2.00	43	40	40	3820	2992	2534	10	8	8	11	10	10	1000
56	0.40	1.72	1.56	2.20	2.00	44	41	41	3942	3084	2630	9	8	8	11	10	10	1000
61	0.40	1.72	1.56	2.20	2.00	45	42	42	4186	3298	2823	9	8	8	11	10	10	1000

Note : Normal current ratings are given in standard conditions, if site conditions are different, current rating should be multiplied by rating factor as given in page no. 25-27

TABLE 17 - STANDARD DRUM LENGTH FOR 1.1kV XLPE/PVC/HR PVC COPPER POWER CABLES

Conductor cross sectional Area	Unarmoured Cables					Armoured Cables				
	1Core	2Core	3Core	3.5Core	4Core	1Core	2Core	3Core	3.5Core	4Core
sqmm	STANDARD LENGTH (MTS) WITH +/-5% TOLERANCE					STANDARD LENGTH (MTS) WITH +/-5% TOLERANCE				
1.5	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
2.5	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
4	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
6	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
10	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
16	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
25	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
35	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
50	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
70	1000	1000	1000	1000	1000	1000	1000	1000	1000	500
95	1000	1000	1000	1000	500	1000	1000	1000	500	500
120	1000	1000	1000	500	500	1000	1000	500	500	500
150	1000	1000	500	500	500	1000	500	500	500	500
185	1000	500	500	500	500	1000	500	500	500	400
240	1000	500	500	500	250	1000	500	500	400	250
300	1000	500	500	250	250	1000	500	250	250	250
400	1000	500	250	250	250	500	400	250	250	250
500	500	400	250	250	250	500	250	250	250	250
630	500	250	250	250	250	500	250	250	250	250
800	500					500				
1000	400					400				

TABLE 18 - STANDARD DRUM LENGTH FOR 1.1kV XLPE/PVC/HR PVC ALUMINIUM POWER CABLES

Conductor cross sectional Area	Unarmoured Cables					Armoured Cables				
	1Core	2Core	3Core	3.5Core	4Core	1Core	2Core	3Core	3.5Core	4Core
sqmm	STANDARD LENGTH (MTS) WITH +/-5% TOLERANCE					STANDARD LENGTH (MTS) WITH +/-5% TOLERANCE				
1.5	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
2.5	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
4	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
6	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
10	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
16	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
25	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
35	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
50	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
70	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
95	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
120	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
150	1000	1000	1000	1000	1000	1000	1000	1000	500	500
185	1000	1000	1000	1000	500	1000	1000	500	500	500
240	1000	1000	1000	500	500	1000	500	500	500	500
300	1000	500	500	500	500	1000	500	500	500	500
400	1000	500	500	500	500	1000	500	500	500	500
500	1000	500	500	500	500	1000	500	500	250	250
630	500	500	500	500	500	500	500	250	250	250
800	500					500				
1000	500					500				

METHOD OF INSTALLATION

The current ratings are also based on the following methods of installation:

A) Single Core cables:	
Type of Installation a) Laid direct in the ground: b) In air:	Method of Installation i. Three cables in close trefoil formation or ii. Two cables touching in horizontal formation. i. Two Single Core cables are installed one above the other & fixed to a vertical wall as follows: the distance between the wall & the surface of the cable being 25 mm in each case. • Cables of sizes upto & including 185 sq.mm are installed at a distance between centres of twice the overall diameter of cable. • Cables if sizes 240 sq.mm & above are installed at a distance between centres of 90 mm. The ratings for two cables may be applied with safety in case where such cables are installed in horizontal formation, on brackets fixed to a wall, either spaced as indicated above or touching throughout ii. Three Single Core cables are installed in trefoil formation touching.
B) Twin & Multi Core cables:	Installed single in ground & in air.

A) RATING FACTORS

i) Rating factors related to variation in ambient air temperature

Air temperature in °C		25	30	35	40	45	50
Rating factors	XLPE	1.14	1.10	1.04	1.00	0.95	0.89
	"A" PVC	1.25	1.16	1.09	1.00	0.90	0.81
	"HR" PVC	1.15	1.10	1.05	1.00	0.94	0.88

ii) Rating factors related to variation in ambient ground temperature

Ground temperature in °C		15	20	25	30	35	40	45
Rating factors	XLPE	1.12	1.08	1.04	1.00	0.96	0.91	0.87
	"A" PVC	1.17	1.12	1.06	1.00	0.94	0.87	0.79
	"HR" PVC	1.12	1.08	1.04	1.00	0.95	0.90	0.85

B) RATING FACTORS

i) For depth of laying (Cables laid direct in the ground)

Depth of laying	Size		
cm	up to 25 sq.mm	above 25 sq.mm up to 300 sq.mm	above 300 sq.mm
75	1.00	1.00	1.00
90	0.99	0.98	0.97
105	0.98	0.97	0.96
120	0.97	0.96	0.95
150	0.96	0.94	0.92
180 & above	0.95	0.93	0.91

ii) for variation in thermal resistivity of soil(twin & multi-core Cable laid direct in the ground)

Nominal area of conductor sq.mm	for value of thermal Resistivity of soil in °C cm/W					
	100	120	150	200	250	300
1.5	1.10	1.05	1.00	0.92	0.86	0.81
2.5	1.10	1.05	1.00	0.92	0.86	0.81
4	1.10	1.05	1.00	0.92	0.86	0.81
6	1.10	1.05	1.00	0.92	0.86	0.81
10	1.10	1.06	1.00	0.92	0.85	0.80
16	1.12	1.06	1.00	0.91	0.84	0.79
25	1.14	1.08	1.00	0.91	0.84	0.78
35	1.15	1.08	1.00	0.91	0.84	0.77
50	1.15	1.08	1.00	0.91	0.84	0.77
70	1.15	1.08	1.00	0.90	0.83	0.76
95	1.15	1.08	1.00	0.90	0.83	0.76
120	1.17	1.08	1.00	0.90	0.82	0.76
150	1.17	1.09	1.00	0.90	0.82	0.76
185	1.18	1.09	1.00	0.89	0.81	0.75
240	1.18	1.09	1.00	0.89	0.81	0.75
300	1.18	1.09	1.00	0.89	0.81	0.75
400	1.19	1.10	1.00	0.89	0.81	0.75
500						
630						

ii) for variation in thermal resistivity of soil(twin & multi-core Cable laid direct in the ground)

Nominal area of conductor sq.mm	two cables touching, for value of thermal Resistivity of soil in °C cm/W						three cables in Trefoil touching, for value of thermal Resistivity of soil in °C cm/W					
	100	120	150	200	250	300	100	120	150	200	250	300
1.5	1.15	1.08	1.00	0.91	0.84	0.78	1.18	1.09	1.00	0.90	0.82	0.76
2.5	1.15	1.08	1.00	0.91	0.84	0.78	1.18	1.09	1.00	0.90	0.82	0.76
4	1.15	1.08	1.00	0.91	0.84	0.78	1.18	1.09	1.00	0.90	0.82	0.76
6	1.15	1.08	1.00	0.91	0.84	0.78	1.18	1.09	1.00	0.90	0.82	0.76
10	1.15	1.08	1.00	0.90	0.83	0.77	1.18	1.09	1.00	0.89	0.81	0.75
16	1.17	1.09	1.00	0.90	0.83	0.77	1.19	1.09	1.00	0.89	0.81	0.74
25	1.18	1.09	1.00	0.90	0.82	0.76	1.19	1.09	1.00	0.88	0.80	0.74
35	1.18	1.09	1.00	0.90	0.82	0.75	1.20	1.09	1.00	0.88	0.80	0.74
50	1.18	1.09	1.00	0.90	0.82	0.75	1.20	1.09	1.00	0.88	0.80	0.74
70	1.19	1.09	1.00	0.89	0.81	0.74	1.21	1.10	1.00	0.88	0.80	0.74
95	1.19	1.09	1.00	0.89	0.81	0.74	1.22	1.10	1.00	0.88	0.80	0.74
120	1.21	1.10	1.00	0.89	0.80	0.74	1.22	1.10	1.00	0.88	0.79	0.74
150	1.21	1.10	1.00	0.89	0.80	0.74	1.22	1.10	1.00	88.00	0.79	0.73
185	1.21	1.10	1.00	0.89	0.80	0.74	1.22	1.10	1.00	88.00	0.79	0.73
240	1.21	1.10	1.00	0.89	0.80	0.74	1.22	1.10	1.00	88.00	0.79	0.73
300	1.21	1.10	1.00	0.89	0.80	0.74	1.22	1.10	1.00	0.88	0.79	0.72
400	1.21	1.10	1.00	0.89	0.80	0.74	1.24	1.11	1.00	0.88	0.79	0.72
500	1.21	1.10	1.00	0.89	0.80	0.74	1.24	1.11	1.00	0.88	0.79	0.72
630	1.21	1.10	1.00	0.89	0.80	0.74	1.24	1.11	1.00	0.88	0.79	0.72

A) GROUP RATING FACTORS

For single core cables laid in trefoil formation

A) Cable laid in ground in horizontal formation

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

B) Cable laid in Trefoil Ducts in horizontal formation

No of Trefoils in group	Distance/Spacing between trefoils		
	Touching	15 cm	45 cm
2	0.87	0.90	0.91
3	0.79	0.83	0.86
4	0.74	0.79	0.82
5	0.71	0.76	0.80

C) Cable laid on Racks/Trays in covered trench with removable covers where air circulation in restricted, Trefoils are seperated by two cable dia horizontally and the trays are in tiers with 30 cm. gap between them.

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

D) Cable laid in open air trench, Trefoils are seperated by two cable dia horizontally and the trays are in tiers with 30 cm. gap between them.

No of racks/ Trays in tiers	No. of trefoils in Horizontal formation		
	1	2	3
1	1.00	0.98	0.96
2	1.00	0.95	0.93
3	1.00	0.94	0.92
6	1.00	0.93	0.90

B) GROUP RATING FACTORS

For Multi-core cables

A) Cable laid insideconcrete trench with removable covers, on cables trays where air circulation in restricted, The cables are spaced by one cable diameter & trays are in tiers by 300mm. The clearance from the wall is 25 mm.

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

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

No of Cable trays in tier	No. of cables				
	1	2	3	6	9
1	0.95	0.90	0.88	0.88	0.88
2	0.90	0.85	0.83	0.83	0.83
3	0.88	0.83	0.81	0.81	0.81
6	0.86	0.81	0.81	0.79	0.81

C) Cable laid on trays exposed to air, The cables touching & traysin tiers by 300mm. The clearance between the wall & the cable is 25 mm.

No of Cable trays in tier	No. of cables per tray				
	1	2	3	6	9
1	1.00	0.84	0.80	0.75	0.73
2	1.00	0.87	0.76	0.71	0.69
3	1.00	0.78	0.74	0.70	0.68
6	1.00	0.76	0.72	0.68	0.66

D) Cable laid direct in ground in horizontal formation

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

E) Cable laid in single way duct/pipes in horizontal formation

No of cables in group	Distance/Spacing of cables			
	Touching	15 cm	30 cm	45 cm
2	0.88	0.90	0.92	0.94
3	0.82	0.84	0.87	0.89
4	0.77	0.80	0.84	0.87
5	0.74	0.78	0.82	0.85
6	0.71	0.76	0.81	0.84

HANDLING & STORAGE

Handling (Unloading at site) : On receipt of cable drums visual inspection of drums should be made ensuring drum packing is original. While unloading the cables certain precautions are to be taken to ensure the safety of the cables.

1. The cable drums should not be dropped or thrown from rail way wagons or trucks during unloading operations as the shock may cause serious damage to cable layers. A crane should be used for unloading cable drums. When lifting drums with the crane, it is recommended that the lagging should be kept in place to prevent the flanges from curshing on to the cable. If the crane is not available, a ramp should be prepared with approximate inclination of 1:3 or 1:4. The cable drum should be rolled over the ramp by means of ropes and winches. Additionally a sand bed at the foot of the ramp may be prepared to brake the rolling the cable drum.
2. Cable should not be dragged along the earth surface.
3. Cable ends should always be sealed by means of suitable end sealing materials to prevant moisturisation of cores and armour.
4. Drums should be rolled in direction of arrow marked on the drum.

Storage:

Cables should be stored in a dry covered place to prevent exposure to climatic conditions and wear and tear of wooden drums and it should preferably on a concrete surface/firm surface which will not cause the drums to sink and thus lead to flange rot and extreme difficulty in moving the drums.

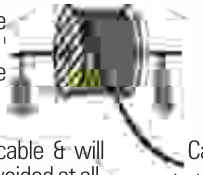
All drums should be stored in such a manner as to leave sufficient space between them for air circulation. It is desirable for drums to stand on battens placed directly under the flanges.

In no case should the drums be stored, "On the Flat", i.e., with flange horizontal.

Laying:

For laying of cables special cares to be taken to prevent sharp bending, kinking, twisting. Cable should be unwound from drum by proper mounting the cable drum on a cable wheel making sure the spindle is strong enough to carry the weight without bending and that it is lying horizontally in the bearings so as to prevent the drum creeping to one side or the other while it is rotating.

Provision should be made to break the drum to avoid further rolling & buckling of cable during sudden stop. A simple wooden plank can server this purpose



This is Incorrect way of pulling the cable & will cause kinks & twist in cable. Shall be avoided at all

Cable must be puled from the top

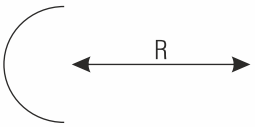
Cable must be pulled across hard & sharp objects to avoid the damage to have covering & insulation cable must laid in ducts or trenches as shown in Fig

However, following salient points are to be considered during laying procedure of cables laid in racks and in built-in trenches.

1. For laying of cables power cables to be placed at the bottom most layer and control cables at top most layer.
2. Single core power cable for use on A.C. system shall be laid in delta formation supported by non-magnetic material. Trefoil clamps of suitable size are to be placed at regular intervals but preferably not more than 800 mm. Axial spacing of two circuits in delta formation shall not be less than 4 times the cable dia. in case of multicore power cables, cables shall be laid side by side, with spacings not less than one cable diameter. However derating factors for cables laid on trenches are to be referred. Multicore power cables and single core D.C. circuits may be clamped by means of galvanised mild steel saddles but 1.1 KV single core cables should be clamped by means of non-magnetic saddles. The saddles shall not be placed at intervals more than 1500 mm. for horizontal and 1200 mm. for vertical runs.
3. Multicore control cables can be laid touching each other on cable racks and wherever required may be taken in two layers. They should be clamped by means of PVC straps both for horizontal and vertical runs (alternatively, fabricated aluminium clamps may be used) at regular intervals.
4. a) If the cables are buried directly in ground I.S. 1255 is to be followed for code of practice. However, generally cables are laid 1000 mm. below finished ground level at any point of cable run and 75 mm. of sand cushioning to be provided.
4. b) In loose soil concrete pillar should be provided for as support and hence pipes are recommended to the used for cable path.
5. If there is a possibility of mechanical damage, cables should be protected by means of mild steel covers placed on racks.
6. While laying cables, special care to be taken at bends. Followings are the recommended bending radius for power and control cables.

Voltage Rating KV	PVC and XLPE Cable	
	Single Core	Multi Core
Upto 1.1 Abover 1.1 but upto 11 K.V. Above 11 K.V.	15 D 15 D 20 D	12 D 15 D 15 D

Where 'D' is overall diameter of cable.



7. Maximum safe pulling force (when pulled by pulling eye) Aluminium Conductor Cables : 3.0 Kg/mm2 Copper Conductor Cables : 5.0 Kg/mm2 Proper method of pulling of cable should be used.

TESTING INSULATION RESISTANCE MEASUREMENT OF CABLE

The voltage rating of I.R. Tester (Megger) should be chosen as following table :

Voltage garde of cable	Rating of IR Tester (Megger) of cable	Voltage grade of cable	Rating of IR Tester (Megger)
1.1 KV	500 V	11 KV	1000 V
3.3 KV	1000 V	22 KV	2500 V
6.6 KV	1000 V	33 KV	2500 V

Testing during laying :

All new cables shall be megger-tested before jointing. After jointing is completed all LV Cables shall be megger-tested.

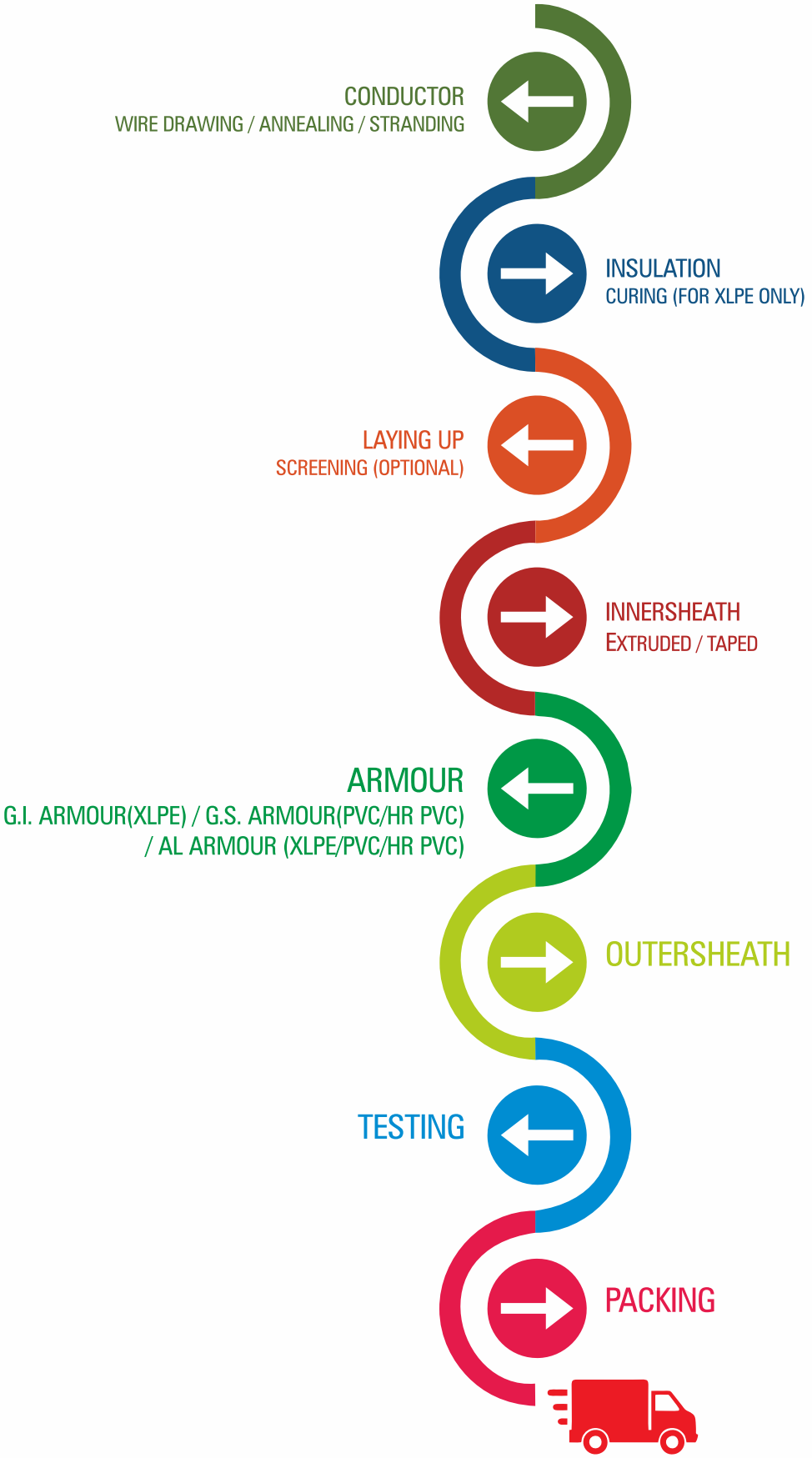
End Terminations & Jointing :

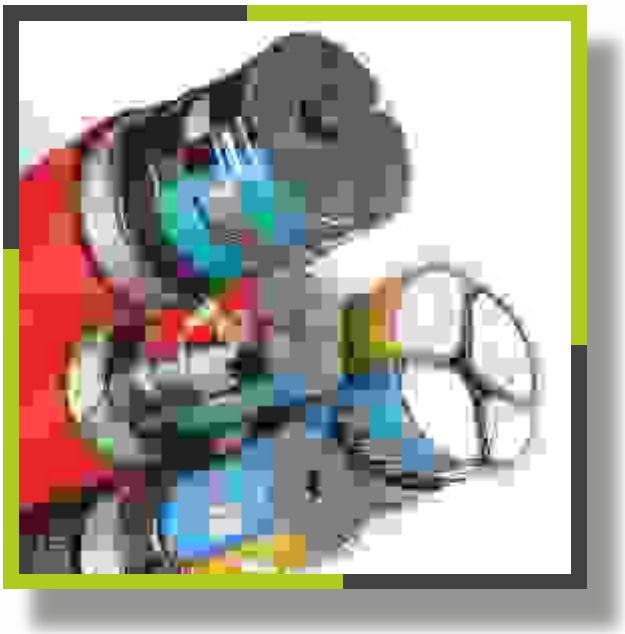
Termination and jointing of Power & Control Cables shall be done by means of compression methods using solderless tinned copper/aluminium terminal lugs. For control cables terminations, ring tongue or reducer pin type terminal lug can also be used to suit the purpose.

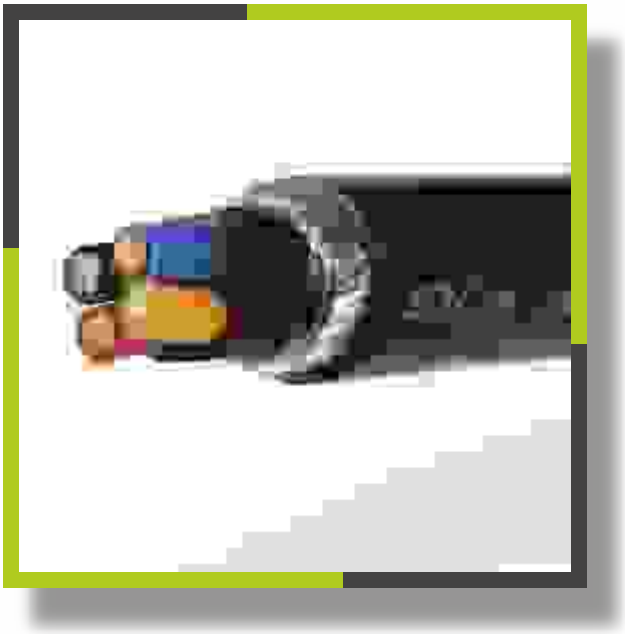
Overhead/Outdoor Termination

XLPE insulation should be protected from direct solar rays or else ultra violet resistant sleeving / tapping must be provided on exposed XLPE insulation at the termination to avoid degradation / cracking due to direct exposer of solar rays.

MANUFACTURING PROCESS FOR LV XLPE/PVC/HR PVC CABLES

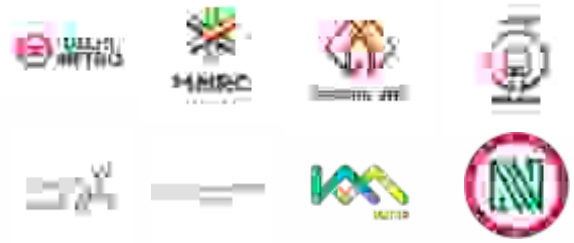






Clients

METRO PROJECTS



CONSTRUCTION SECTOR

GOVERNMENT SECTOR

HOSPITALITY SECTOR

TELECOM SECTOR

CORPORATE OFFICES

CONTRACTORS

WAREHOUSE & DATA CENTRE

BMS SECTOR

AUTOMOTIVE SECTOR

BONTON® CABLES

Branch Offices

Northern Region

Chandigarh : Plot No. 1-A, 35 Feet Road, New Patanjali, Opp. Ajanta Pharma, VIII. Pabhat, Zirakpur -140603
Tel.: 0176 - 2503906, +91 88720 64720

Ludhiana : BXX-3369, Sandhu Tower-2, 2nd Floor, Ferozpur Road, Gurudev Nagar, Ludhiana (Punjab)-141 001

Jaipur: 327-A, 3rd Floor Ganpati Plaza M.I. Road, Jaipur, Rajasthan - 302001
Tel.: 0141 - 4018060, +91 98292 04080

Lucknow: 210, 2nd Floor, Saran Chamber-II, 5, Park Road, Lucknow (U.P) - 226001
Tel.: 0522 - 4103417, +91 73793 33388

Haridwar: Akashdeep Enclave Phase 2 , Near Delhi Flat Delhi Road Roorkee District Haridwar - 247667, Mob.: 8191004004

Central Region

Indore: A-52, New Siyaganj, Patthar godown road, Indore, M.P. - 452003
Tel.: +91 98270 11260

Central Western Region

Mumbai: We Work, 5th Floor, Spectrum Tower, Mindspace, Chincholi Bunder Road, Malad (West), Mumbai- 400064
Mob: +91 9649352700

Goa: Guirim, Sorvem Waddo, Bardez, Goa - 403507

Southern Region

Bangalore: RR Nagar, Bangalore- 560098
Mob: +91 8026722905

Kochi: 44/533, St Martin road, Palarivattom, Kochi, Kerala -682025
Tel.: 484 - 4058309, +91 97455 44303

Secunderabad: Plot No: 18-B, Banjara Nagar Colony, Tirumalagiri Telangana, Secunderabad - 500015
Tel.: 040 - 40267506

Chennai: Plot No-5, Harinery Sree Srinivasa Avenue, Kanchi Nagar Extn. Vinayagapuram, Kolathur, Chennai - 600099, Tamilnadu
Tel: +91 99440 10660

Pune: 13/1/124, Parmar Niwas, Near Dake Chowk, Behind Kulkarni Building Sukhsagar Nagar, Katraj Pune, 411046 Maharashtra

Eastern Region

Kolkata: Room No. F-8, 1st Floor, Tirreti Bazaar, 22, Rabindra Sarai, Kolkatta - 700012
Tel.: +91 97485 40227

Bonton Cables (India) Pvt. Ltd.
Head Office: Epitome Building No. - 5, 18 Floor, Tower-B, DLF Cyber City, Gurugram - 122002 (Haryana) Tel.: +91 81302 99001, +91 81302 99003

Works:

Plant 1: A-115 RIICO Industrial Area, Phase-1, Bhiwadi — 301019 Dist. Alwar, Rajasthan (INDIA)

Plant 2: A-6A Kaharani Industrial Area, Bhiwadi — 301019 Dist. Alwar, Rajasthan (INDIA)