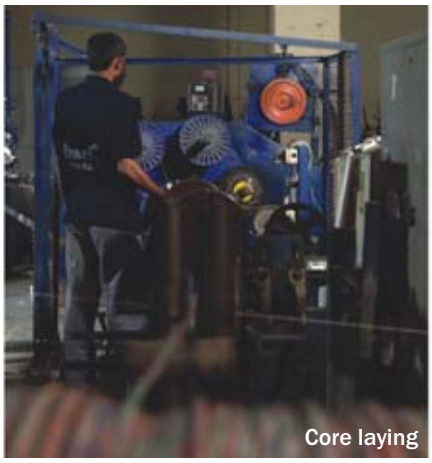
Quality always stands out.

EVEREST®

"The No Problem Cables"



Core laying

Tinning

Conductor bunching

Conductor drawing

PRODUCT CATALOGUE
2009

INDEX

INTRODUCTION

Universal Spares (India) Private Limited established in 1965 made a small beginning with the manufacture of telescopic antennas and gradually added to its range antenna wire, electronic wires, CATV co-axial cables under the brand EVEREST®. The company totally relied to produce quality products and soon brand EVEREST® became synonymous with quality and people started calling it as "THE NO PROBLEM CABLES".

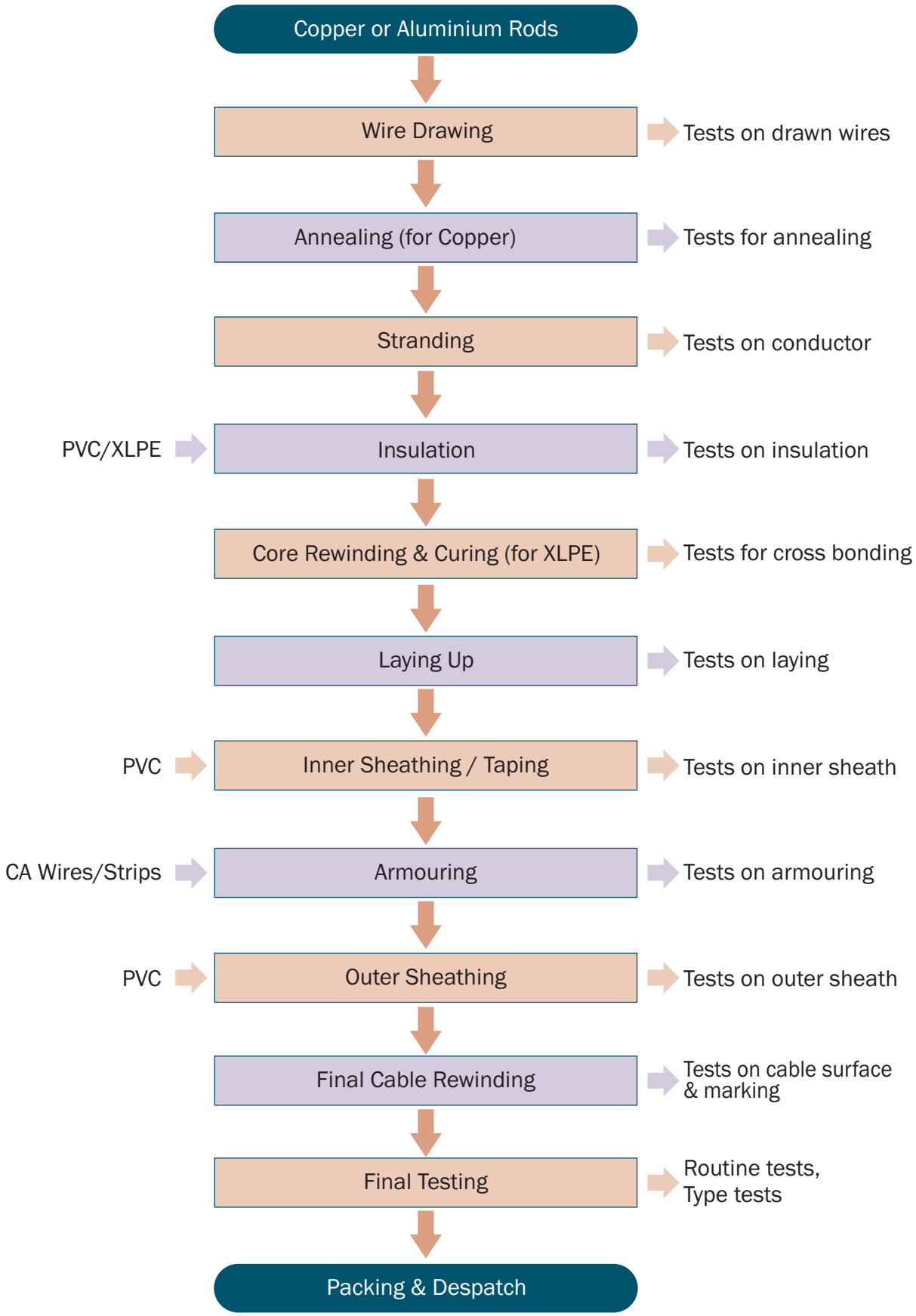
The year 1997 saw the company incorporated into Private Limited entity, shifted its factory to state of Haryana bordering Delhi to a much bigger space, putting up an excellent in house infrastructural facilities i.e most modern state-of-the-art cable manufacturing unit with integrated plants i.e copper wire drawing along with online annealing , tinning, PVC compounding, etc, well equipped testing laboratory and all environmental precautions taken into account-thus exceeding ISO: 14001 regulations.

The company enhanced its product range of cables and as well as diversified by including manufacturing / assembling of wire harness / cable assemblies , moulded cords, terminals , copper lugs, etc. by installing most modern machinery with complete tool room to meet the needs of varied industrial sectors. It also completely overhauled its working system by employing well educated experienced staff and skilled workers, adopting modern training methods, stringent policy for souring raw material inputs i.e copper rod, aluminum , PVC resin , etc only directly from renowned manufacturers.

The company having experienced the fruits of quality which can be defined as the composite product characteristic of engineering and manufacture that determines the degree to which the use meet the expectation of customers made it the thrust point of its policy. The company is on threshold of setting global standards for manufacturing products by offering world class quality and services towards this end. It already has ISO-9001 accreditation, necessary Bureau of Indian Standards Certification Marks and are pioneers in having obtained Underwriters Laboratory Inc, USA – UL / C-UL approvals for its cables and many more are in the pipeline including European standards CE approvals to meet its indigenous as well as export targets.

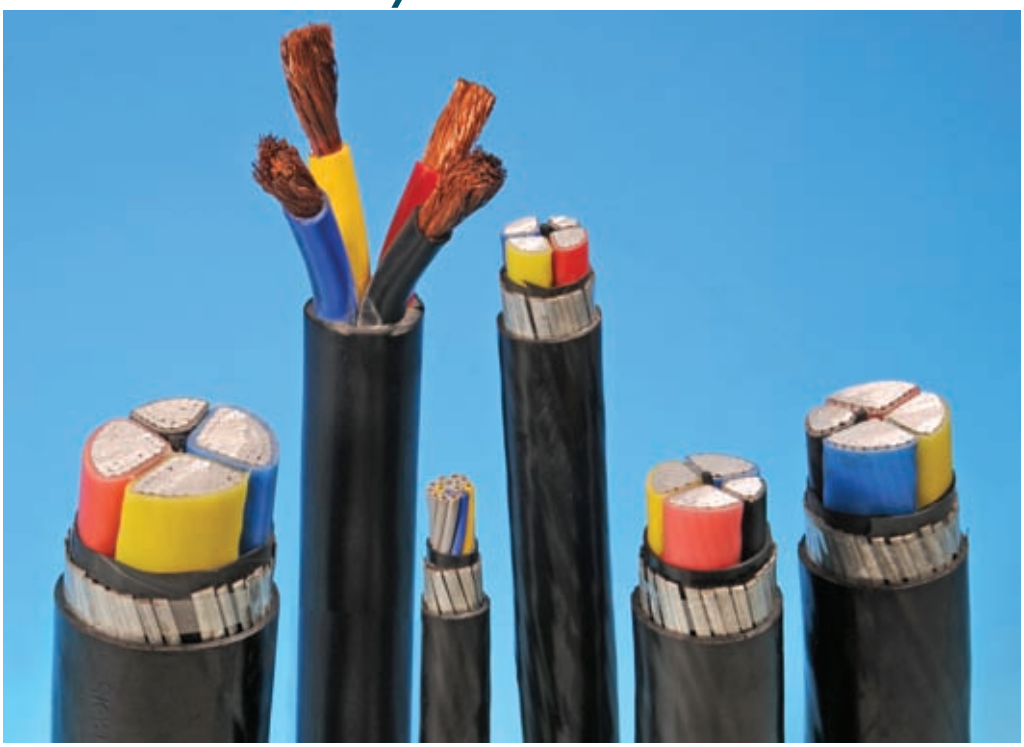
The company's national / International clientele graph is steadily climbing northwise and turnoverwise as well. It has drawn an impressive expansion programme to include in its product range HT PVC/XLPE Power & Control cables, expand its instrumentation cables range to include special cables for critical areas PTFE, silicon cables etc and gradual up gradation is already underway. In this direction the company management is already exploring avenues for joint ventures. Thus the company has a very bright future and would be a shining star on the horizon of cable manufacturing sector soon.

MANUFACTURING PROCESS FLOW



All tests during the process are checked and confirmed according to the documented quality assurance plan.

LT PVC/XLPE CABLES



EVEREST® brand LT PVC/XLPE Cables are of excellent quality and easy to handle. Simplified terminators and jointing techniques make these cables eminently suitable, among other applications, for industrial and mining installation. The main advantages of PVC Cables can be summarized as follows:

1. Insulation resistance and breakdown strength are practically unaffected by moisture. These cables are thus suitable for laying even under water.
2. Can be overloaded for short periods without any appreciable effect on cable life.
3. Can be laid vertically and on steep slopes as there is no impregnating compound involved.
4. Flame retardant since PVC ignites with great difficulty and is self-extinguishing.
5. Immune to chemicals normally encountered in practice.
6. Due to their light weight, PVC cables are easy to install and handle. Small bending radius permits the termination of these cables in limited space.
7. Low tension PVC cables do not normally require sealing ends, when terminated indoor. The terminations can therefore be effected quickly and economically.
8. Tough but smooth outer covering and are thus abrasion proof.
9. PVC cables are not affected by vibrations.
10. PVC cables have high short circuit capacity since they can withstand a high transient temperature without any deformation of insulation or displacement of conductor.
11. PVC cables have a long service life.

GENERAL CONSTRUCTION

CONDUCTOR

The conductor is composed of plain copper / aluminium wires complying with IS:8130-1984. Mining cables used in gassy mines are of copper conductor only.

INSULATION

The conductors are insulated with suitably compounded PVC / XLPE which is applied to the conductor by extrusion process.

CORE IDENTIFICATION/COLOUR SCHEME

Cores are identified by colour scheme of insulation. The following colour scheme is adopted:

a) 1 core	-	Red, black, yellow, blue or natural
b) 2 cores	-	Red and black
c) 3 cores	-	Red, yellow and blue
d) 4cores	-	Red, yellow, blue and black(reduced neutral core is also black)
e) 5 cores	-	Red, yellow, blue, black and light grey
f) For cables with more than 5 cores	-	Two adjacent cores (counting and directional) in each layer are coloured blue and yellow respectively. Remaining cores are light grey.

INNER SHEATH (COMMON COVERING)

For all cables with two or more cores, a common covering (inner sheath) is provided over the laid up cores either by extrusion or by wrapping of plastic or proofed tapes. Single core cables do not require inner sheath.

ARMOURING

Cables can be armoured depending upon the application with round steel wire or steel strips as armouring. In case of cables where diameter over the inner sheath does not exceed 13 mm, the armour consists of galvanised round steel wires. Above this size, the armour can be galvanised flat strips or galvanised round steel wires as per customer requirement. In case of single core cables intended for use on a.c. systems, the armouring shall be of aluminium wires/strips or any other non-magnetic material.

Armouring of PVC mining cables consists of galvanised round steel wires/strips. Wherever necessary, a few tinned copper wires/strips are included to meet the resistance requirements.

The armouring machine in action

OUTER SHEATH

Over the armouring, or in case of unarmoured cables, over the inner sheath (for single core over the insulation), a tough outer sheath of PVC is applied by extrusion. Normally black in colour it provides a tough but smooth outer covering to cables.

The trade mark EVEREST® along with the size of the cable and voltage grade and year/code of manufacture are embossed on the outer sheath. Wherever desired the customer's name and sequential marking can also be arranged. The embossed text repeats at desired length of the cable.

TYPE DESIGNATION

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

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

Note: When type designation does not contain 'A' in the beginning then the cable has copper conductor.

TESTING OF PVC CABLES

Testing is a vital part of cable manufacturing. All raw material testing, in process checking and finished cable testing are thoroughly carried out to ensure quality of the cable. Universal Spares (India) Pvt. Ltd. has a well equipped testing laboratory for carrying out electrical, mechanical, physical and chemical tests which are required as per relevant specifications. The various tests as provided in the Indian Standards are carried out on EVEREST® cables. These are classified in three different groups; **1) Routine Tests, 2) Type Tests,** and, **3) Acceptance Tests.**

ROUTINE TESTS

The following routine tests are carried out on each and every length of cable before it leaves the factory:

a) Conductor Resistance Test

This test ensures that conductor resistance is within the specified limits thereby ensuring that the continuity of conductor is maintained throughout the cable length and that the conductor has the required cross section area. The DC resistance is measured at room temperature and is then corrected to standard reference temperature at 20°C.

b) High Voltage Test

This test ensures that the insulation will safely withstand the rated voltage with permissible variation in normal operation.

c) Armoured Resistance Test

For mining cables

TYPE TESTS

These tests, on samples taken from each production lot, are carried out to prove conformity of general qualities and design to the specification of a particular type of cable enumerated in the relevant Indian standards.

ACCEPTANCE TEST

Customers can request various acceptance tests as provided in the relevant Indian standards to be carried out before accepting the cables.

QUALITY CONTROL AND TESTING

The tests on PVC/XLPE insulated cables are divided in three groups:

Tests at Raw Material Stage

Cables are manufactured from quality raw materials which are tested in our laboratory, strictly according to our works specifications. The raw materials and tests generally conducted are:

(i) Aluminum/ Copper

Conductor resistance, wire diameter, tensile strength, annealing and wrapping test.

(ii) PVC Compound

Density, tensile strength, elongation at break, volume resistivity, ageing, hot deformation and shrinkage, hot set test.

(iii) Steel Strip/Wire

Dimensions, tensile strength, elongation at break, torsion, resistivity, zinc coating and winding test.

Production Shop Preventive Tests, i.e., Process Inspection

Process control tests are carried out at every stage to check the cable manufacturing process and take steps necessary to eliminate any deficiencies. The control tests are to ascertain that cables manufactured at our works are of desired quality and comply with specified standards and technical specifications.

The quality of EVEREST® cables is maintained at the highest level due to the latest processing technology with which these cables are manufactured. The salient features of the process inspection carried out by us for PVC/XLPE Cables are:

(i) Wire Drawing

(a) Wire diameter and surface finish
(b) Wrapping and tensile strength test on aluminum wires
(c) Annealing test on copper wires
(d) Conductor Resistance

(ii) Conductor Stranding

(a) Dimensions
(b) Surface and shape of conductor
(c) Lay and direction of lay for stranding
(d) Shaping conductor
(e) DC Resistance
(f) No. of strands in each conductor

(iii) Insulation

(a) Dimensions of cores
(b) Thickness
(c) Surface
(d) Spark test, high voltage test and IR test
(e) Curing test for XLPE Cables

Conductor resistance testing in the test laboratory

(iv) Laying up

(a) Sequence of cores

(b) Direction of laying and lay length

(c) Circularity of cable

(d) Dia over laid up cores

(e) Application of fillers in the interstices

(v) Inner Sheath

(a) Surface

(b) Concentricity

(c) Thickness

(d) Dia over inner sheath

(vi) Armouring

(a) Lay length and direction of armouring wires/strips

(b) No. of strips/wires

(c) Uniformity of application and dia over armouring

(d) Dimensions of strip/wire

(vii) Outer Sheath

(a) Thickness

(b) Concentricity and dia over sheath

(c) Surface

(d) Embossing with requisite information on outer sheath.

Finished Cable Tests

Finished cable tests can be divided into two categories:

(a) Routine tests to which each and every length of cable is subjected.

(b) Type tests to which samples of batch of cable are subjected. The samples for these tests are selected as per scheme laid down in the ISI licence.

FRLS CABLES

A result of keeping pace with the latest trends in technological innovations in the field, our FRLS cables use specially formulated compounds to meet stringent requirements of international specifications. The EVEREST® range of FRLS cables covers various requirements of customer; be it oxygen index or corrosive gas generation or light absorbance EVEREST® has the cable for you.

A typical FRLS PVC Sheathed Cable give following results:

1) Oxygen Index - 29% min.

2) Temperature Index - 250 °C min.

3) Smoke Density Rating - 60% max.

4) Acid Gas Emission - 20% max.

5) Flamability Test as per :

(i) IEC-332-I

(ii) IEC-332-III

(iii) IEEE-383

(iv) SS-424-1475

ELECTRICAL PARAMETERS - CONDUCTOR

MAX. CONDUCTOR RESISTANCE (D.C.) AT 20°C FOR INSULATED CABLES CONFORMING TO IS:8130 (1984)

Nominal cross sectional area of conductor	Solid Conductor		Stranded Conductor		Flexible Conductor	
	Class - 1		Class - 2		Class - 5	
	Plain Copper	Aluminium	Plain Copper	Aluminium	Plain Copper	Tinned Copper
sq mm	Ω/km	Ω/km	Ω/km	Ω/km	Ω/km	Ω/km
0.5	36.0	-	-	-	39.0	40.1
0.75	24.5	-	-	-	26.0	26.7
1.0	18.1	-	18.1	-	19.5	20.0
1.5	12.1	18.1	12.1	18.1	13.3	13.7
2.5	7.41	12.1	7.41	12.1	7.98	8.21
4.0	4.61	7.41	4.61	7.41	4.95	5.09
6.0	3.08	4.61	3.08	4.61	3.30	3.39
10.0	1.83	3.08	1.83	3.08	1.91	1.95
16.0	1.15	1.91	1.15	1.91	1.21	1.24
25.0	-	-	0.727	1.20	0.780	0.795
35.0	-	-	0.524	0.868	0.554	0.565
50.0	-	-	0.387	0.641	0.386	0.393
70.0	-	-	0.268	0.443	0.272	0.277
95.0	-	-	0.193	0.320	0.206	0.210
120.0	-	-	0.153	0.253	0.161	0.164
150.0	-	-	0.124	0.206	0.129	0.132
185.0	-	-	0.0991	0.164	0.106	0.108
240.0	-	-	0.0754	0.125	0.0801	0.0817
300.0	-	-	0.0601	0.100	0.0641	0.0654
400.0	-	-	0.0470	0.0778	0.0486	0.0495
500.0	-	-	0.0366	0.0605	0.0384	0.0391
630.0	-	-	0.0283	0.0469	0.0287	0.0292
800.0	-	-	0.0221	0.0367	-	-
1000.0	-		0.0176	0.0291	-	-

CALCULATED CONDUCTOR RESISTANCE (A.C.) - ALUMINIUM (AT OPERATING TEMPERATURE)

Nominal cross sectional area of conductor	Operating Temperature		
	70°C	85°C	90°C
sq mm	Ω/km	Ω/km	Ω/km
1.5	21.72	22.81	-
2.5	14.52	15.25	-
4.0	8.89	9.34	-
6.0	5.53	5.81	-
10.0	3.70	3.84	-
16.0	2.29	2.41	-
25.0	1.44	1.51	1.54
35.0	1.04	1.09	1.11
50.0	0.769	0.808	0.821
70.0	0.532	0.558	0.567
95.0	0.384	0.404	0.411
120.0	0.304	0.319	0.325
150.0	0.248	0.261	0.265
185.0	0.198	0.208	0.211
240.0	0.152	0.159	0.162
300.0	0.122	0.128	0.130
400.0	0.096	0.1005	0.1023
500.0	0.076	0.0793	0.0807
630.0	0.061	0.0636	0.0648
800.0	0.0501	0.0522	0.0530
1000.0	0.0422	0.0437	0.0443

PVC CABLES

TECHNICAL DATA - PHYSICAL

1.1 KV SINGLE CORE, ALUMINIUM / COPPER CONDUCTOR, PVC INSULATED, ARMOURED / UNARMOURED, PVC SHEATHED CABLES CONFORMING TO IS:1554 (PART - 1)

Unarmoured						Armoured					
Nominal cross-sectional area of conductor	Nominal thickness of insulation	Nominal thickness of outer sheath	Approx. overall diameter	Approximate weight of cable		Nominal thickness of insulation	Armour dimensions (wire/strip)	Min. thickness of outer sheath	Approx. overall dia	Approximate weight of cable	
				Alu.	Copper					Alu.	Copper
sq mm	mm	mm	mm	kg/km	kg/km	mm	mm	mm	mm	kg/km	kg/km
1.5	0.80	1.80	7.20	60	72	1.10	1.40	1.24	10.50	110	122
2.5	0.90	1.80	8.00	72	90	1.20	1.40	1.24	11.00	125	150
4	1.00	1.80	8.60	85	110	1.30	1.40	1.24	11.70	145	180
6	1.00	1.80	9.00	100	140	1.30	1.40	1.24	12.20	165	220
10	1.00	1.80	10.00	120	200	1.30	1.40	1.24	13.50	190	280
16	1.00	1.80	11.20	150	270	1.30	1.40	1.24	14.50	245	350
25	1.20	1.80	13.00	210	380	1.50	1.40	1.24	16.50	305	480
35	1.20	1.80	14.00	250	480	1.50	1.40	1.24	17.50	360	600
50	1.40	1.80	16.00	320	625	1.70	1.40	1.24	19.50	450	750
70	1.40	1.80	17.20	400	850	1.70	1.40	1.40	20.00	570	1000
95	1.60	1.80	19.50	525	1150	1.90	4x0.80	1.40	20.80	650	1300
120	1.60	2.00	21.30	620	1400	1.90	4x0.80	1.40	22.30	760	1550
150	1.80	2.00	23.30	750	1700	2.10	4x0.80	1.40	24.30	900	1900
185	2.00	2.00.	25.00	900	2100	2.30	4x0.80	1.40	26.30	1065	2300
240	2.20	2.00	28.00	1125	2700	2.50	4x0.80	1.40	29.00	1320	2950
300	2.40	2.00	30.50	1380	3350	2.70	4x0.80	1.56	32.20	1595	3600
400	2.60	2.20	35.00	1725	4250	3.00	4x0.80	1.56	36.00	1970	4500
500	3.00	2.20	38.50	2190	5400	3.40	4x0.80	1.56	39.80	2450	5650
630	3.40	2.40	43.50	2800	6750	3.90	4x0.80	1.72	44.80	3100	7300
800	3.40	2.40	48.00	3380	8700	3.90	4x0.80	1.88	49.50	3780	9000
1000	3.40	2.60	51.50	4100	10700	3.90	4x0.80	2.04	53.00	4550	11100

1.1 KV TWO CORE, ALUMINIUM / COPPER CONDUCTOR, PVC INSULATED, ARMOURED / UNARMOURED, PVC SHEATHED CABLES CONFORMING TO IS:1554 (PART - 1)

Nominal cross sectional area of conductor	Nominal thickness of insulation	Minimum thickness of inner sheath	Unarmoured				Armoured				
			Nominal thickness of outer sheath	Approx. over all diameter	Approximate weight of cable		Armour dimensions (wire/strip)	Minimum thickness of outer sheath	Approx. overall diameter	Approximate weight of cable	
					Alu.	Copper				Alu.	Copper
sq mm	mm	mm	mm	mm	kg/km	kg/km	mm	mm	mm	kg/km	kg/km
1.5	0.80	0.3	1.80	12.00	150	180	1.40	1.24	13.70	370	400
2.5	0.90	0.3	1.80	13.00	185	235	1.40	1.24	15.00	425	470
4	1.00	0.3	1.80	14.10	215	280	1.40	1.24	16.50	500	550
6	1.00	0.3	1.80	15.50	260	350	1.40	1.24	18.50	550	650
10	1.00	0.3	1.80	17.00	320	450	1.40	1.24	20.00	635	800
16	1.00	0.3	1.80	17.00	350	550	4x0.80	1.40	20.00	600	850
25	1.20	0.3	2.00	20.00	450	800	4x0.80	1.40	21.00	725	1050
35	1.20	0.3	2.00	21.50	550	1000	4x0.80	1.40	23.00	850	1300
50	1.40	0.3	2.00	24.50	725	1300	4x0.80	1.40	25.00	1025	1600
70	1.40	0.3	2.00	26.50	880	1750	4x0.80	1.56	28.00	1250	2100
95	1.60	0.4	2.20	30.20	1190	2350	4x0.80	1.56	30.50	1550	2750
120	1.60	0.4	2.20	32.00	1350	2850	4x0.80	1.56	32.50	1800	3300
150	1.80	0.4	2.40	35.00	1650	3500	4x0.80	1.72	35.50	2080	3950
185	2.00	0.5	2.40	38.00	1950	4300	4x0.80	1.88	38.50	2500	4800
240	2.20	0.5	2.60	43.00	2450	5500	4x0.80	2.04	43.50	3100	6100
300	2.40	0.6	2.80	47.00	2970	6850	4x0.80	2.20	47.50	3720	7500
400	2.60	0.7	3.20	52.50	3820	8750	4x0.80	2.36	53.50	4550	9400
500	3.00	0.7	3.40	58.00	4775	11200	4x0.80	2.68	58.50	5650	11900
630	3.40	0.7	3.80	65.00	6045	14500	4x0.80	2.84	66.00	6950	15200

PVC CABLES

TECHNICAL DATA - PHYSICAL

1.1 KV THREE CORE, ALUMINIUM / COPPER CONDUCTOR, PVC INSULATED ARMOURED / UNARMOURED, PVC SHEATHED CABLES CONFORMING TO IS:1554 (PART - 1)

Nominal cross sectional area of conductor	Nominal thickness of insulation	Minimum thickness of inner sheath	Unarmoured				Armoured				
			Nominal thickness of outer sheath	Approx. overall Diameter	Approximate weight of cable		Armour dimensions (wire/strip)	Minimum thickness of outer sheath	Approx. overall diameter	Approximate weight of cable	
					Alu.	Copper				Alu.	Copper
sq mm	mm	mm	mm	mm	kg/km	kg/km	mm	mm	mm	kg/km	kg/km
1.5	0.80	0.3	1.80	12.50	155	190	1.40	1.24	14.50	400	425
2.5	0.90	0.3	1.80	13.60	210	250	1.40	1.24	15.50	470	525
4	1.00	0.3	1.80	15.10	245	325	1.40	1.24	17.00	550	625
6	1.00	0.3	1.80	16.20	290	410	1.40	1.24	18.50	620	750
10	1.00	0.3	1.80	18.00	375	580	1.40	1.40	20.50	715	975
16	1.00	0.3	1.80	19.50	450	750	4x0.80	1.40	20.50	710	1025
25	1.20	0.3	2.00	22.00	600	1100	4x0.80	1.40	23.00	900	1400
35	1.20	0.3	2.00	24.00	740	1400	4x0.80	1.40	25.00	1050	1700
50	1.40	0.3	2.00	27.20	920	1850	4x0.80	1.56	28.00	1300	2200
70	1.40	0.4	2.20	30.50	1220	2500	4x0.80	1.56	31.50	1650	2900
95	1.60	0.4	2.20	34.00	1570	3320	4x0.80	1.56	35.00	2050	3800
120	1.60	0.4	2.20	37.00	1800	4040	4x0.80	1.72	37.50	2400	4600
150	1.80	0.5	2.40	40.50	2230	5000	4x0.80	1.88	41.20	2850	5600
185	2.00	0.5	2.60	45.00	2750	6200	4x0.80	1.88	45.50	3400	6850
240	2.20	0.6	2.80	50.50	3440	8000	4x0.80	2.20	51.50	4250	8800
300	2.40	0.6	3.00	55.80	4250	9950	4x0.80	2.36	56.50	5100	10800
400	2.60	0.7	3.40	62.50	5400	12700	4x0.80	2.52	63.00	6300	13700
500	3.00	0.7	3.60	69.50	6800	16200	4x0.80	2.84	70.50	7850	17250
630	3.40	0.7	4.00	78.00	8750	20800	4x0.80	3.00	78.50	9750	21900

1.1 KV THREE & HALF CORE, ALUMINIUM / COPPER CONDUCTOR, PVC INSULATED, ARMOURED / UNARMOURED, PVC SHEATHED CABLES CONFORMING TO IS:1554 (PART - 1)

Nominal cross sectional area of conductor	Nominal thickness of insulation	Minimum thickness of inner sheath	Unarmoured				Armoured				
			Nominal thickness of outer sheath	Approx. over all diameter	Approximate weight of cable		Armour dimensions (wire/strip)	Minimum thickness of outer sheath	Approx. overall diameter	Approximate weight of cable	
					Alu.	Copper				Alu.	Copper
sq mm	mm	mm	mm	mm	kg/km	kg/km	mm	mm	mm	kg/km	kg/km
25	1.20/1.0	0.3	2.00	23.60	690	1295	4X0.80	1.40	24.30	1010	1600
35	1.20/1.0	0.3	2.00	26.00	825	1600	4X0.80	1.40	26.30	1200	1950
50	1.40/1.20	0.3	2.20	29.30	1075	2200	4X0.80	1.56	29.90	1520	2600
70	1.40/1.20	0.4	2.20	32.50	1400	3000	4X0.80	1.56	33.50	1850	3400
95	1.60/1.40	0.4	2.20	36.80	1810	4000	4X0.80	1.56	37.50	2320	4450
120	1.60/1.40	0.5	2.40	40.20	2190	5000	4X0.80	1.72	41.00	2750	5550
150	1.80/1.40	0.5	2.40	43.80	2550	5900	4X0.80	1.88	44.90	3220	6550
185	2.00/1.60	0.5	2.60	48.50	3150	7400	4X0.80	2.04	49.50	3900	8150
240	2.20/1.60	0.6	3.00	55.00	4050	9500	4X0.80	2.20	55.50	4850	10300
300	2.40/1.80	0.6	3.20	61.50	4950	11800	4X0.80	2.36	61.00	5800	12700
400	2.60/2.0	0.7	3.40	68.50	6300	15000	4X0.80	2.68	69.20	7250	16300
500	3.00/2.20	0.7	3.80	77.00	7900	19000	4X0.80	2.84	77.00	9100	20200
630	3.40/2.40	0.7	4.00	86.50	9850	24500	4X0.80	3.00	87.00	11000	25500

PVC CABLES

TECHNICAL DATA - PHYSICAL

1.1 KV FOUR CORE, ALUMINIUM / COPPER CONDUCTOR, PVC INSULATED ARMOURED / UNARMOURED, PVC SHEATHED CABLES CONFORMING TO IS:1554 (PART - 1)

Nominal cross sectional area of conductor	Nominal thickness of insulation	Minimum thickness of inner sheath	Unarmoured				Armoured				
			Nominal thickness of outer sheath	Approx. overall Diameter	Approximate weight of cable		Armour dimensions (wire/strip)	Minimum thickness of outer sheath	Approx. overall diameter	Approximate weight of cable	
					Alu.	Copper				Alu.	Copper
sq mm	mm	mm	mm	mm	kg/km	kg/km	mm	mm	mm	kg/km	kg/km
1.5	0.80	0.3	1.80	13.00	200	240	1.40	1.24	15.00	445	480
2.5	0.90	0.3	1.80	14.50	230	320	1.40	1.24	17.00	520	580
4	1.00	0.3	1.80	16.00	285	400	1.40	1.24	18.50	610	720
6	1.00	0.3	1.80	17.20	340	500	1.40	1.40	20.00	680	850
10	1.00	0.3	1.80	19.50	430	710	4x0.80	1.40	21.00	700	1000
16	1.00	0.3	2.00	21.50	550	950	4x0.80	1.40	22.50	840	1250
25	1.20	0.3	2.00	25.00	720	1400	4x0.80	1.40	25.50	1080	1750
35	1.20	0.3	2.00	27.00	890	1800	4x0.80	1.40	28.00	1300	2200
50	1.40	0.4	2.20	31.20	1200	2400	4x0.80	1.56	32.00	1650	2850
70	1.40	0.4	2.20	35.00	1520	3250	4x0.80	1.56	35.50	2050	3750
95	1.60	0.4	2.40	39.00	2000	4400	4x0.80	1.72	40.50	2570	4950
120	1.60	0.5	2.40	42.50	2350	5400	4x0.80	1.88	43.50	3100	6050
150	1.80	0.5	2.60	47.00	2890	6600	4x0.80	1.88	47.50	3570	7300
185	2.00	0.6	2.80	52.00	3600	8250	4x0.80	2.04	53.00	4350	9000
240	2.20	0.6	3.00	58.50	4550	10650	4x0.80	2.36	60.00	5450	11500
300	2.40	0.7	3.40	66.00	5650	13300	4x0.80	2.52	66.50	6540	14300
400	2.60	0.7	3.60	73.00	7100	16800	4x0.80	2.84	74.50	8160	18000
500	3.00	0.7	4.00	83.00	9000	21500	4x0.80	3.00	84.00	10200	22800
630	3.40	0.7	4.00	93.00	11100	27500	4x0.80	3.00	93.50	12500	28800

1.5 SQ MM, SOLID COPPER CONDUCTOR, PVC INSULATED, ARMOURED / UNARMOURED, PVC SHEATHED, MULTICORE CONTROL CABLES-1.1KV CONFORMING TO IS:1554 (PART - 1)

Number of cores	No. & Nominal dia of strand	Nominal thickness of insulation	Nominal thickness of inner sheath	Unarmoured			Armoured				
				Nominal thickness of outer sheath	Approx. over all diameter	Approx. weight of cable	Armour wire dimensions	Armour wire dimensions	Minimum thickness of outer sheath	Approx. overall diameter	Approx. weight of cable
	mm	mm	mm	mm	mm	kg/km	mm	mm	mm	mm	kg/km
2	1/1.40	0.80	0.30	1.80	11.30	160	1.40	-	1.24	13.60	410
3	1/1.40	0.80	0.30	1.80	11.60	195	1.40	-	1.24	14.00	450
4	1/1.40	0.80	0.30	1.80	12.60	220	1.40	-	1.24	14.80	490
5	1/1.40	0.80	0.30	1.80	13.30	260	1.40	-	1.24	15.50	510
6	1/1.40	0.80	0.30	1.80	14.30	290	1.40	-	1.24	16.30	595
7	1/1.40	0.80	0.30	1.80	14.30	315	1.40	-	1.24	16.30	625
8	1/1.40	0.80	0.30	1.80	15.50	350	1.40	-	1.24	18.80	700
9	1/1.40	0.80	0.30	1.80	16.80	395	1.40	-	1.24	19.10	745
10	1/1.40	0.80	0.30	1.80	17.50	410	1.40	-	1.40	20.00	770
12	1/1.40	0.80	0.30	1.80	18.30	475	-	4X0.80	1.24	19.00	750
14	1/1.40	0.80	0.30	1.80	19.00	530	-	4X0.80	1.40	20.50	850
16	1/1.40	0.80	0.30	1.80	20.00	590	-	4X0.80	1.40	21.00	910
19	1/1.40	0.80	0.30	2.00	21.00	695	-	4X0.80	1.40	22.00	1020
24	1/1.40	0.80	0.30	2.00	24.30	845	-	4X0.80	1.40	25.00	1230
27	1/1.40	0.80	0.30	2.00	25.00	920	-	4X0.80	1.40	26.00	1350
30	1/1.40	0.80	0.30	2.00	25.50	1005	-	4X0.80	1.40	27.00	1400
37	1/1.40	0.80	0.30	2.00	27.80	1180	-	4X0.80	1.40	29.00	1600
44	1/1.40	0.80	0.30	2.00	31.00	1330	-	4X0.80	1.56	31.50	1820
52	1/1.40	0.80	0.40	2.20	32.50	1650	-	4X0.80	1.56	33.50	2100
61	1/1.40	0.80	0.40	2.20	34.00	1800	-	4X0.80	1.56	35.50	2400

PVC CABLES

TECHNICAL DATA - PHYSICAL

2.5 SQ MM, SOLID COPPER CONDUCTOR, PVC INSULATED, ARMOURED / UNARMOURED, PVC SHEATHED, MULTICORE CONTROL CABLES - 1.1 KV CONFORMING TO IS:1554 (PART - 1)

Number of cores	No. & Nominal dia of strand	Nominal thickness of insulation	Nominal thickness of inner sheath	Unarmoured			Armoured				
				Nominal thickness of outer sheath	Approx. over all diameter	Approx. weight of cable	Armour wire dimensions	Armour strip dimensions	Minimum thickness of outer sheath	Approx. overall diameter	Approx. weight of cable
	mm	mm	mm	mm	mm	kg/km	mm	mm	mm	mm	kg/km
2	1/1.78	0.90	0.30	1.80	12.60	205	1.40	-	1.24	15.00	450
3	1/1.78	0.90	0.30	1.80	13.20	250	1.40	-	1.24	15.50	500
4	1/1.78	0.90	0.30	1.80	14.20	295	1.40	-	1.24	16.50	585
5	1/1.78	0.90	0.30	1.80	15.30	350	1.40	-	1.24	17.40	640
6	1/1.78	0.90	0.30	1.80	16.40	385	1.40	-	1.24	18.30	720
7	1/1.78	0.90	0.30	1.80	16.40	425	1.40	-	1.24	18.30	750
8	1/1.78	0.90	0.30	1.80	18.00	500	1.40	-	1.40	20.50	850
9	1/1.78	0.90	0.30	1.80	19.60	560	-	4X0.80	1.40	21.00	870
10	1/1.78	0.90	0.30	1.80	20.50	590	-	4X0.80	1.40	21.20	900
12	1/1.78	0.90	0.30	2.00	21.50	650	-	4X0.80	1.40	21.80	1000
14	1/1.78	0.90	0.30	2.00	22.20	740	-	4X0.80	1.40	22.80	1100
16	1/1.78	0.90	0.30	2.00	23.20	840	-	4X0.80	1.40	24.00	1215
19	1/1.78	0.90	0.30	2.00	24.90	930	-	4X0.80	1.40	25.50	1350
24	1/1.78	0.90	0.30	2.00	28.70	1200	-	4X0.80	1.40	29.50	1600
27	1/1.78	0.90	0.30	2.00	29.40	1295	-	4X0.80	1.40	30.00	1750
30	1/1.78	0.90	0.30	2.00	30.20	1445	-	4X0.80	1.56	31.30	1900
37	1/1.78	0.90	0.40	2.20	32.50	1750	-	4X0.80	1.56	33.80	2250
44	1/1.78	0.90	0.40	2.20	37.00	2100	-	4X0.80	1.56	37.50	2550
52	1/1.78	0.90	0.40	2.20	38.50	2350	-	4X0.80	1.56	39.00	3000
61	1/1.78	0.90	0.40	2.20	41.00	2785	-	4X0.80	1.56	41.50	3300

CURRENT RATINGS

CURRENT RATING (A.C.) FOR COPPER CONDUCTOR, MULTICORE 650/1100 VOLTS UNARMOURED OR ARMOURED CONTROL CABLES CONFORMING TO IS: 1554 (PART-1)

Number of cores	1.5 mm^2					
	In Ground		In Ducts		In Air	
	Gen. PVC	H.R. PVC	Gen. PVC	H.R. PVC	Gen. PVC	H.R. PVC
	amp	amp	amp	amp	amp	amp
2	23	26	20	24	20	24
3	21	24	17	21	17	21
4	21	24	17	21	17	21
5	21	24	17	21	17	21
6	15	17	13	16	13	16
7	14	16	13	15	13	15
8	14	16	12	14	12	14
9	14	16	12	14	12	14
10	13	15	11	13	11	13
12	12	14	10	12	10	12
14	11	13	10	12	10	12
16	11	13	9	11	9	11
19	10	11	9	11	9	11
24	9	10	8	10	8	10
27	9	10	8	10	8	10
30	9	10	7	8	7	8
37	8	9	7	8	7	8
44	7	8	7	7	7	7
52	7	7	6	7	6	7
61	6	7	6	7	6	7

CURRENT RATING (A.C.) FOR COPPER CONDUCTOR, MULTICORE 650/1100 VOLTS UNARMOURED OR ARMOURED CONTROL CABLES CONFORMING TO IS: 1554 (PART-1)

Number of cores	2.5 mm^2					
	In Ground		In Ducts		In Air	
	Gen. PVC	H.R. PVC	Gen. PVC	H.R. PVC	Gen. PVC	H.R. PVC
	amp	amp	amp	amp	amp	amp
2	32	38	27	32	27	32
3	27	30	24	28	24	28
4	27	30	24	28	24	28
5	27	30	24	28	24	28
6	21	24	18	21	18	21
7	20	22	17	20	17	20
8	19	21	17	18	17	18
9	19	21	16	18	16	18
10	18	20	15	16	15	16
12	17	19.	14	16	14	16
14	16	18	13	15	13	15
16	15	17	13	15	13	15
19	14	16	12	14	12	14
24	13	14	11	13	11	13
27	12	13	10	12	10	12
30	12	13	10	12	10	12
37	11	12	9	10	9	10
44	10	11	9	10	9	10
52	9	10	8	10	8	10
61	8	9	8	9	8	9

PVC CABLES

CURRENT RATINGS

CURRENT RATING (A.C.) FOR TWO SINGLE -CORE 650/1100 VOLTS UNARMOURED OR ARMOURED (NON-MAGNETIC) CABLES CONFORMING TO IS: 1554 (PART-1)

Nominal area of Conductor	Laid Direct					
	In Ground		In Ducts		In Air	
	Aluminium	Copper	Aluminium	Copper	Aluminium	Copper
sq mm	amp	amp	amp	amp	amp	amp
1.5	21	25	19	23	18	24
2.5	28	35	25	31	25	32
4	36	46	33	42	32	43
6	44	57	42	54	41	54
10	59	75	56	72	56	72
16	75	94	71	92	72	92
25	97	125	93	120	99	125
35	120	150	110	140	120	155
50	145	180	130	165	150	190
70	170	220	155	200	185	235
95	205	265	180	230	215	275
120	230	300	200	255	240	310
150	265	340	220	280	270	345
185	300	380	240	305	305	390
240	335	420	270	340	350	445
300	370	465	295	370	395	500
400	410	500	335	405	455	570
500	435	540	355	430	490	610
630	485	590	395	465	560	680

CURRENT RATING (A.C.) FOR THREE SINGLE-CORE 650/1100 VOLTS UNARMOURED OR ARMOURED (NON-MAGNETIC) CABLES CONFORMING TO IS: 1554 (PART-1)

Nominal area of Conductor	Laid Direct					
	In Ground		In Ducts		In Air	
	Aluminium	Copper	Aluminium	Copper	Aluminium	Copper
sq mm	amp	amp	amp	amp	amp	amp
1.5	17	22	17	21	15	20
2.5	24	30	24	29	21	27
4	31	39	30	38	27	35
6	39	49	37	48	35	44
10	51	65	51	64	47	60
16	66	85	65	83	64	82
25	86	110	84	110	84	110
35	100	130	100	125	105	130
50	120	155	115	150	130	165
70	140	190	135	175	155	205
95	175	220	155	200	190	245
120	195	250	170	220	220	280
150	220	280	190	245	250	320
185	240	305	210	260	290	370
240	270	345	225	285	335	425
300	295	375	245	310	380	475
400	325	400	275	335	435	550
500	345	425	295	355	480	590
630	390	470	320	375	550	660

CURRENT RATING (A.C.) FOR TWIN CORE 650/1100 VOLTS UNARMOURED OR ARMOURED CABLES CONFORMING TO IS: 1554 (PART-1)

Nominal area of Conductor	Laid Direct					
	In Ground		In Ducts		In Air	
	Aluminium	Copper	Aluminium	Copper	Aluminium	Copper
sq mm	amp	amp	amp	amp	amp	amp
1.5	18	23	16	20	16	20
2.5	25	32	21	27	21	27
4	32	41	27	35	27	35
6	40	50	34	44	35	45
10	55	70	45	58	47	60
16	70	90	58	75	59	78
25	90	115	76	97	78	105
35	110	140	92	120	99	125
50	135	165	115	145	125	155
70	160	205	140	180	150	195
95	190	240	170	215	185	230
120	210	275	190	235	210	265
150	240	310	210	270	240	305
185	275	350	240	300	275	350
240	320	405	275	345	325	410
300	355	450	305	385	365	465
400	385	490	345	425	420	530

CURRENT RATING (A.C.) FOR THREE, THREE & HALF, FOUR-CORE 650/1100 VOLTS UNARMOURED OR ARMOURED CABLES CONFORMING TO IS: 1554 (PART-1)

Nominal area of Conductor	Laid Direct					
	In Ground		In Ducts		In Air	
	Aluminium	Copper	Aluminium	Copper	Aluminium	Copper
sq mm	amp	amp	amp	amp	amp	amp
1.5	16	21	14	17	13	17
2.5	21	27	18	24	18	24
4	28	36	23	30	23	30
6	35	45	30	38	30	39
10	46	60	39	50	40	52
16	60	77	50	64	51	66
25	76	99	63	81	70	90
35	92	120	77	99	86	110
50	110	145	95	125	105	135
70	135	175	115	150	130	165
95	165	210	140	175	155	200
120	185	240	155	195	180	230
150	210	270	175	225	205	265
185	235	300	200	255	240	305
240	275	345	235	295	280	355
300	305	385	260	335	315	400
400	335	425	290	360	375	455

PVC CABLES

CURRENT RATINGS FACTORS

RATING FACTORS FOR VARIATION IN AMBIENT AIR TEMPERATURE

Ambient Air Temperature °C	15	20	25	30	35	40	45	50	55
Rating Factor General Purpose PVC	1.40	1.32	1.25	1.16	1.09	1.00	0.90	0.80	0.69
Rating Factor Heat Resistant PVC	1.28	1.22	1.17	1.12	1.06	1.00	0.94	0.87	0.82

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

Ground Temperature °C	15	20	25	30	35	40	45	50	55
Rating Factor General Purpose PVC	1.17	1.12	1.06	1.00	0.94	0.87	0.79	0.71	0.61
Rating Factor Heat Resistant PVC	1.13	1.09	1.04	1.00	0.95	0.90	0.85	0.80	0.74

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

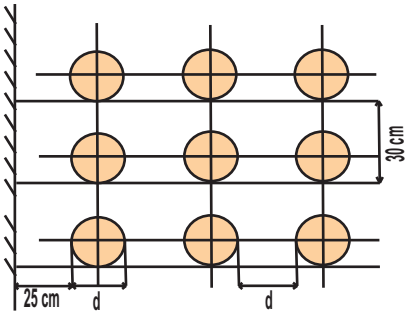
Size of Cable sq mm	Depth of Laying (mm)					
	75	90	105	120	150	180 & above
Upto 25 mm^2	1.00	0.99	0.98	0.97	0.96	0.95
Above 25 mm^2 - 300 mm^2	1.00	0.98	0.97	0.96	0.94	0.93
Above 300 mm^2	1.00	0.97	0.96	0.95	0.92	0.91

RATING FACTORS FOR DEPTH OF LAYING FOR TWIN / MULTICORE CABLES (IN SINGLE WAY DUCTS)

Laid in Single Way Ducts	Depth of Laying (mm)									
	75	90	105	120	150	180	270	360	450	540 & Above
Rating Factor	1.00	0.99	0.98	0.97	0.96	0.95	0.92	0.91	0.90	0.89

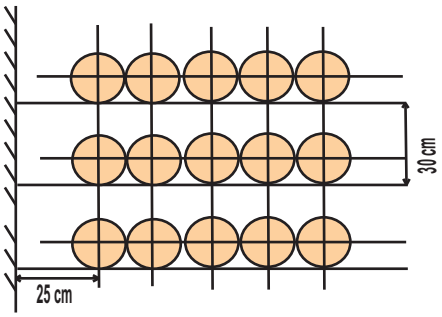
RATING FACTORS FOR MULTICORE CABLES LAID ON RACKS IN AIR (WITH SPACING BETWEEN CABLES EQUAL TO DIAMETER OF THE CABLE)

Number of racks	Number of Cables per rack				
	1	2	3	6	9
1	1.00	0.98	0.96	0.93	0.92
2	1.00	0.95	0.93	0.90	0.89
3	1.00	0.94	0.92	0.89	0.88
6	1.00	0.93	0.90	0.87	0.86



RATING FACTORS FOR MULTICORE CABLES LAID ON RACKS IN AIR (WITH CABLES TOUCHING)

Number of racks	Number of Cables per rack				
	1	2	3	6	9
1	1.00	0.84	0.80	0.75	0.73
2	1.00	0.80	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



PVC CABLES

CURRENT RATINGS FACTORS

GROUP RATING FACTORS FOR CIRCUITS OF TWO SINGLE-CORE CABLES, SIDE BY SIDE & TOUCHING, HORIZONTAL FORMATION, LAID DIRECT IN THE GROUND

Number of cables in group	Spacing of group of two cables (Centre to centre in mm)				
	Touching	150	300	450	600
2	0.80	0.85	0.90	0.92	0.95
3	0.70	0.78	0.85	0.88	0.91
4	0.64	0.73	0.81	0.86	0.89
5	0.59	0.70	0.79	0.84	0.88
6	0.55	0.67	0.77	0.83	0.87
7	0.53	0.65	0.76	0.82	0.86
8	0.51	0.64	0.76	0.82	0.86
9	0.49	0.63	0.74	0.81	0.85
10	0.48	0.63	0.74	0.81	0.85
11	0.47	0.62	0.73	0.80	0.84
12	0.46	0.61	0.73	0.80	0.84

GROUP RATING FACTORS FOR CIRCUITS OF THREE SINGLE-CORE CABLES, IN TREFOIL & TOUCHING, HORIZONTAL FORMATION, LAID DIRECT IN THE GROUND

Number of cables in group	Spacing of group of three cables (Centre to centre in mm)				
	Touching	150	300	450	600
2	0.77	0.81	0.86	0.88	0.89
3	0.67	0.71	0.78	0.81	0.83
4	0.61	0.64	0.72	0.76	0.80
5	0.57	0.60	0.69	0.74	0.77
6	0.53	0.57	0.66	0.72	0.75
7	0.51	0.55	0.64	0.70	0.74
8	0.49	0.53	0.63	0.69	0.73
9	0.47	0.52	0.62	0.68	0.73
10	0.45	0.51	0.61	0.67	0.72
11	0.44	0.50	0.60	0.66	0.72
12	0.43	0.49	0.59	0.65	0.71

GROUP RATING FACTORS FOR TWIN & MULTI-CORE CABLES, IN HORIZONTAL FORMATION LAID DIRECT IN THE GROUND

Number of cables in group	Spacing of cables (Center to center in mm)				
	Touching	150	300	450	600
2	0.80	0.84	0.87	0.90	0.91
3	0.68	0.74	0.79	0.83	0.86
4	0.62	0.69	0.75	0.80	0.83
5	0.58	0.65	0.72	0.77	0.80
6	0.55	0.62	0.69	0.75	0.78
7	0.52	0.59	0.67	0.73	0.77
8	0.50	0.57	0.66	0.72	0.75
9	0.48	0.55	0.65	0.71	0.75
10	0.46	0.54	0.64	0.70	0.74
11	0.45	0.53	0.63	0.70	0.74
12	0.44	0.52	0.62	0.69	0.73

GROUP RATING FACTORS FOR TWIN & MULTI-CORE CABLES, IN TIER FORMATION LAID DIRECT IN THE GROUND

Number of cables in group	Spacing of cables (Center to center in mm)					
	No. of Tiers	Touching	150	300	450	600
2	1	0.80	0.84	0.87	0.90	0.91
3	1	0.68	0.74	0.79	0.83	0.86
4	2	0.60	0.66	0.73	0.77	0.79
5	2	0.55	0.61	0.68	0.71	0.73
6	2	0.51	0.57	0.63	0.67	0.69
7	3	0.48	0.54	0.59	0.63	0.64
8	3	0.46	0.51	0.56	0.60	0.61
9	3	0.44	0.48	0.53	0.57	0.58
10	4	0.42	0.47	0.52	0.55	0.56
11	4	0.41	0.46	0.50	0.54	0.55
12	4	0.40	0.45	0.49	0.53	0.54

PVC CABLES

CURRENT RATINGS FACTORS

RATING FACTORS FOR VARIATION IN THERMAL RESISTIVITY OF SOIL TWO & THREE SINGLE-CORE CABLES (LAID DIRECT IN THE GROUND)

Nominal area of conductor	Two Cables Touching						Three Cables Trefoil Touching					
	Thermal Resistivity of Soil (°C cm / Ω)											
sq mm	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	0.88	0.79	0.73
185	1.21	1.10	1.00	0.89	0.80	0.74	1.22	1.10	1.00	0.88	0.79	0.73
240	1.21	1.10	1.00	0.89	0.80	0.74	1.22	1.10	1.00	0.88	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	0.88	0.80	0.74	1.24	1.11	1.00	0.88	0.79	0.72
500	1.21	1.10	1.00	0.88	0.80	0.74	1.24	1.11	1.00	0.88	0.79	0.72
630	1.22	1.10	1.00	0.88	0.80	0.74	1.24	1.11	1.00	0.88	0.79	0.72

RATING FACTORS FOR VARIATION IN THERMAL RESISTIVITY OF SOIL TWIN & MULTI-CORE CABLES

Nominal area of conductor	Laid Direct in the Ground						Single - Way Ducts					
	Thermal Resistivity of Soil (°C cm / Ω)											
sq mm	100	120	150	200	250	300	100	120	150	200	250	300
1.50	1.10	1.05	1.00	0.92	0.86	0.81	1.05	1.03	1.00	0.96	0.91	0.88
2.50	1.10	1.05	1.00	0.92	0.86	0.81	1.05	1.03	1.00	0.96	0.91	0.88
4.00	1.10	1.05	1.00	0.92	0.86	0.81	1.05	1.03	1.00	0.96	0.91	0.88
6.00	1.10	1.05	1.00	0.92	0.86	0.81	1.05	1.03	1.00	0.96	0.91	0.88
10.00	1.10	1.06	1.00	0.92	0.85	0.80	1.05	1.03	1.00	0.95	0.90	0.87
16.00	1.12	1.06	1.00	0.91	0.84	0.79	1.06	1.03	1.00	0.95	0.90	0.86
25.00	1.14	1.08	1.00	0.91	0.84	0.78	1.07	1.04	1.00	0.95	0.90	0.85
35.00	1.15	1.08	1.00	0.91	0.84	0.77	1.08	1.04	1.00	0.94	0.89	0.84
50.00	1.15	1.08	1.00	0.91	0.84	0.77	1.08	1.04	1.00	0.94	0.89	0.84
70.00	1.15	1.08	1.00	0.90	0.83	0.76	1.08	1.04	1.00	0.94	0.88	0.83
95.00	1.15	1.08	1.00	0.90	0.83	0.76	1.08	1.04	1.00	0.94	0.87	0.83
120.00	1.17	1.09	1.00	0.90	0.82	0.76	1.09	1.05	1.00	0.94	0.87	0.82
150.00	1.17	1.09	1.00	0.90	0.82	0.76	1.09	1.05	1.00	0.93	0.86	0.82
185.00	1.18	1.09	1.00	0.89	0.81	0.75	1.10	1.05	1.00	0.93	0.86	0.81
240.00	1.18	1.09	1.00	0.89	0.81	0.75	1.10	1.05	1.00	0.92	0.86	0.81
300.00	1.18	1.09	1.00	0.89	0.81	0.75	1.10	1.05	1.00	0.92	0.86	0.81
400.00	1.19	1.10	1.00	0.89	0.81	0.75	1.11	1.06	1.00	0.92	0.86	0.81

XLPE CABLES

TECHNICAL DATA - PHYSICAL

1.1 KV SINGLE CORE, ALUMINIUM CONDUCTOR, XLPE INSULATED, HARD DRAWN ALUMINIUM ARMOURED / UNARMOURED, PVC SHEATHED CABLES CONFORMING TO IS: 7098 (PART - 1)

Nominal cross sectional area of conductor	Unarmoured				Armoured				
	Nominal thickness of insulation	Nominal thickness of outer sheath	Approx. overall Diameter	Approx. weight of cable	Nominal thickness of insulation	Armour dimensions {wire/strip}	Minimum thickness of outer sheath	Approx. overall diameter	Approx. weight of cable
sq mm	mm	mm	mm	kg/km	mm	mm	mm	mm	kg/km
1.5	0.70	1.80	6.70	53	-	-	-	-	-
2.5	0.70	1.80	7.10	60	-	-	-	-	-
4	0.70	1.80	7.60	70	-	-	-	-	-
6	0.70	1.80	8.20	83	1.00	1.40	1.24	10.60	140
10	0.70	1.80	9.00	100	1.00	1.40	1.24	11.40	170
16	0.70	1.80	10.20	131	1.00	1.40	1.24	12.70	210
25	0.90	1.80	12.00	180	1.20	1.40	1.24	14.20	275
35	0.90	1.80	13.00	220	1.20	1.40	1.24	15.20	350
50	1.00	1.80	14.50	290	1.30	1.40	1.24	16.80	400
70	1.10	1.80	16.20	350	1.40	1.40	1.24	18.70	500
95	1.10	1.80	18.00	450	1.40	4x0.80	1.40	20.00	580
120	1.20	1.80	19.90	550	1.50	4x0.80	1.40	21.50	700
150	1.40	2.00	22.20	650	1.70	4x0.80	1.40	23.50	810
185	1.60	2.00	24.30	825	1.90	4x0.80	1.40	25.50	970
240	1.70	2.00	26.50	1020	2.00	4x0.80	1.40	28.50	1200
300	1.80	2.00	29.60	1200	2.10	4x0.80	1.56	31.00	1450
400	2.00	2.20	33.00	1550	2.40	4x0.80	1.56	35.00	1750
500	2.20	2.20	36.50	1950	2.60	4x0.80	1.56	38.00	2200
630	2.40	2.20	40.50	2425	2.80	4x0.80	1.72	42.50	2750
800	2.60	2.40	46.50	3050	3.10	4x0.80	1.72	47.50	3350
1000	2.80	2.60	50.00	3750	3.30	4x0.80	1.88	53.50	4170

1.1 KV TWO CORE, ALUMINIUM CONDUCTOR, XLPE INSULATED, ARMOURED / UNARMOURED, PVC SHEATHED CABLES CONFORMING TO IS: 7098 (PART - 1)

Nominal cross sectional area of conductor	Nominal thickness of insulation	Minimum thickness of inner sheath	Unarmoured			Armoured			
			Nominal thickness of outer sheath	Approx. overall diameter	Approx. weight of cable	Armour dimensions {wire/strip}	Minimum thickness of outer sheath	Approx. overall diameter	Approx. weight of cable
sq mm	mm	mm	mm	mm	kg/km	mm	mm	mm	kg/km
1.5	0.70	0.3	1.80	11.50	170	1.40	1.24	13.30	350
2.5	0.70	0.3	1.80	12.20	190	1.40	1.24	14.10	400
4	0.70	0.3	1.80	13.00	220	1.40	1.24	15.00	450
6	0.70	0.3	1.80	14.30	275	1.40	1.24	16.00	525
10	0.70	0.3	1.80	16.00	325	1.40	1.24	17.80	600
16	0.70	0.3	1.80	16.00	325	1.40	1.40	18.00	625
25	0.90	0.3	2.00	18.50	425	4x0.80	1.40	19.20	650
35	0.90	0.3	2.00	20.00	525	4x0.80	1.40	20.90	750
50	1.00	0.3	2.00	22.00	650	4x0.80	1.40	23.00	910
70	1.10	0.3	2.00	24.80.	775	4x0.80	1.56	26.00	1150
95	1.10	0.4	2.20	27.80	1025	4x0.80	1.56	28.50	1400
120	1.20	0.4	2.20	30.50	1200	4x0.80	1.56	31.00	1650
150	1.40	0.4	2.20	32.50	1450	4x0.80	1.72	33.80	1900
185	1.60	0.5	2.40	36.00	1750	4x0.80	1.72	37.00	2250
240	1.70	0.5	2.60	40.50	2200	4x0.80	1.88	41.50	2800
300	1.80	0.6	2.80	43.50	2750	4x0.80	2.04	44.50	3300
400	2.00	0.6	3.00	49.00	3400	4x0.80	2.36	50.50	4150
500	2.20	0.7	3.40	54.50	4250	4x0.80	2.52	55.20	5050
630	2.40	0.7	3.60	61.00	5350	4x0.80	2.68	62.00	6150

XLPE CABLES

TECHNICAL DATA - PHYSICAL

1.1 KV THREE CORE, ALUMINIUM CONDUCTOR, XLPE INSULATED, ARMOURED / UNARMOURED, PVC SHEATHED CABLES CONFORMING TO IS: 7098 (PART - 1)

Nominal cross sectional area of conductor	Nominal thickness of insulation	Minimum thickness of inner sheath	Unarmoured			Armoured			
			Nominal thickness of outer sheath	Approx. overall diameter	Approx. weight of cable	Armour dimensions (wire/strip)	Minimum thickness of outer sheath	Approx. overall diameter	Approx. weight of cable
sq mm	mm	mm	mm	mm	kg/km	mm	mm	mm	kg/km
1.5	0.70	0.3	1.80	12.00	170	1.40	1.24	13.80	400
2.5	0.70	0.3	1.80	13.00	195	1.40	1.24	14.70	450
4	0.70	0.3	1.80	13.80	225	1.40	1.24	15.60	500
6	0.70	0.3	1.80	15.00	300	1.40	1.24	17.00	550
10	0.70	0.3	1.80	17.00	350	1.40	1.24	18.50	650
16	0.70	0.3	1.80	18.00	400	4X0.80	1.24	18.50	740
25	0.90	0.3	2.00	21.00	550	4X0.80	1.40	21.20	800
35	0.90	0.3	2.00	22.50	700	4X0.80	1.40	23.20	1000
50	1.00	0.3	2.00	25.00	850	4X0.80	1.40	25.80	1150
70	1.10	0.4	2.20	29.50	1150	4X0.80	1.56	29.50	1500
95	1.10	0.4	2.20	32.00	1400	4X0.80	1.56	32.20	1800
120	1.20	0.4	2.20	35.20	1700	4X0.80	1.56	35.50	2175
150	1.40	0.5	2.40	39.00	2050	4X0.80	1.72	39.50	2600
185	1.60	0.5	2.60	43.00	2550	4X0.80	1.88	43.50	3050
240	1.70	0.6	2.80	48.50	3200	4X0.80	2.04	49.00	3800
300	1.80	0.6	3.00	53.20	3900	4X0.80	2.20	53.50	4550
400	2.00	0.7	3.20	59.50	4900	4X0.80	2.52	60.50	5700
500	2.20	0.7	3.60	66.50	6150	4X0.80	2.68	66.50	6950
630	2.40	0.7	3.80	73.50	7700	4X0.80	2.84	74.00	8500

1.1 KV THREE & HALF CORE, ALUMINIUM CONDUCTOR, XLPE INSULATED, ARMOURED / UNARMOURED, PVC SHEATHED CABLES CONFORMING TO IS: 7098 (PART - 1)

Nominal cross sectional area of conductor	Nominal thickness of insulation	Minimum thickness of inner sheath	Unarmoured			Armoured			
			Nominal thickness of outer sheath	Approx. overall diameter	Approx. weight of cable	Armour dimensions (wire/strip)	Minimum thickness of outer sheath	Approx. overall diameter	Approx. weight of cable
sq mm	mm	mm.	mm	mm	kg/km	mm	mm.	mm	kg/km
25	0.90/0.70	0.3	2.0	22.00	620	4X0.80	1.40	23.00	900
35	0.90/0.70	0.3	2.0	24.50	750	4X0.80	1.40	24.90	1050
50	1.00/0.90	0.3	2.0	27.00	925	4X0.80	1.40	27.50	1250
70	1.10/0.90	0.4	2.2	31.00	1250	4X0.80	1.56	31.50	1700
95	1.10/1.00	0.4	2.2	34.50	1600	4X0.80	1.56	35.00	2020
120	1.20/1.10	0.4	2.2	38.00	1925	4X0.80	1.72	39.00	2450
150	1.40/1.10	0.5	2.4	42.50	2300	4X0.80	1.72	42.70	2800
185	1.60/1.10	0.5	2.6	46.50	2870	4X0.80	1.88	47.50	3400
240	1.70/1.20	0.6	2.8	52.50	3625	4X0.80	2.04	53.00	4300
300	1.80/1.40	0.6	3.0	57.50	4400	4X0.80	2.20	57.50	5150
400	2.00/1.60	0.7	3.4	65.50	5625	4X0.80	2.52	66.50	6500
500	2.20/1.70	0.7	3.6	72.50	7000	4X0.80	2.68	73.50	8000
630	2.40/1.80	0.7	4.0	82.00	8900	4X0.80	3.00	82.50	9950

XLPE CABLES
TECHNICAL DATA - PHYSICAL

1.1 KV FOUR CORE, ALUMINIUM CONDUCTOR, XLPE INSULATED, ARMOURED / UNARMOURED, PVC SHEATHED CABLES CONFORMING TO IS: 7098 (PART - 1)

Nominal cross sectional area of conductor	Nominal thickness of insulation	Minimum thickness of inner sheath	Unarmoured			Armoured			
			Nominal thickness of outer sheath	Approx. overall diameter	Approx. weight of cable	Armour dimensions (wire/strip)	Minimum thickness of outer sheath	Approx. overall diameter	Approx. weight of cable
sq mm	mm	mm	mm	mm	kg/km	mm	mm	mm	kg/km
1.5	0.70	0.3	1.80	13.00	200	1.40	1.24	14.50	420
2.5	0.70	0.3	1.80	14.00	225	1.40	1.24	16.00	500
4	0.70	0.3	1.80	15.00	275	1.40	1.24	16.50	550
6	0.70	0.3	1.80	16.00	300	1.40	1.24	18.50	620
10	0.70	0.3	1.80	18.50	400	1.40	1.40	20.50	750
16	0.70	0.3	1.80	19.50	450	4x0.80	1.40	20.50	830
25	0.90	0.3	2.00	23.50	700	4x0.80	1.40	24.00	950
35	0.90	0.3	2.00	26.00	825	4x0.80	1.40	26.50	1200
50	1.00	0.3	2.00	29.00	1050	4x0.80	1.56	30.00	1450
70	1.10	0.4	2.20	33.70	1450	4x0.80	1.56	34.20	1850
95	1.10	0.4	2.20	36.70	1800	4x0.80	1.56	37.20	2220
120	1.20	0.5	2.40	41.00	2200	4x0.80	1.72	41.50	2700
150	1.40	0.5	2.60	45.50	2700	4x0.80	1.88	45.70	3250
185	1.60	0.5	2.80	50.00	3325	4x0.80	2.04	51.00	3900
240	1.70	0.6	3.00	56.50	4200	4x0.80	2.20	57.00	4850
300	1.80	0.7	3.20	63.00	5100	4x0.80	2.36	63.50	5850
400	2.00	0.7	3.60	70.50	6450	4x0.80	2.68	71.00	7300
500	2.20	0.7	3.80	79.00	8000	4x0.80	2.84	79.50	9100
630	2.40	0.7	4.00	88.50	10100	4x0.80	3.00	88.50	11200

CURRENT RATINGS

CURRENT RATING (A.C.) FOR 1.1 KV XPLE INSULATED ALUMINIUM CONDUCTOR POWER CABLES

Nominal area of cond.	Single Core/Three Core		Multi Core	
	In Ground	In Air	In Ground	In Air
sq mm	amp	amp	amp	am.
6	45	40	43	40
10	59	53	57	53
16	76	73	78	70
25	99	115	95	99
35	117	140	116	117
50	138	170	140	140
70	168	210	170	176
95	204	255	200	221
120	230	300	225	258
150	265	342	255	294
185	295	385	285	339
240	340	450	325	402
300	390	519	370	461
400	450	605	435	542
500	500	700	481	624
630	555	809	537	723
800	625	935	-	-
1000	690	1065	-	-

XLPE CABLES

CURRENT RATING FACTORS

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

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

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

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

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

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

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

Nominal area of conductor sq mm	Value of Thermal Resistivity of soil °C. cm/Ω					
	100	120	150	200	250	300
25	1.07	1.04	1.00	0.93	0.89	0.84
35	1.07	1.04	1.00	0.93	0.88	0.83
50	1.07	1.04	1.00	0.93	0.88	0.83
70	1.08	1.04	1.00	0.93	0.88	0.83
95	1.08	1.05	1.00	0.93	0.87	0.83
120	1.09	1.05	1.00	0.93	0.87	0.83
150	1.09	1.05	1.00	0.93	0.87	0.83
185	1.09	1.05	1.00	0.93	0.87	0.82
240	1.09	1.05	1.00	0.93	0.87	0.82
300	1.09	1.05	1.00	0.92	0.87	0.82
400	1.10	1.06	1.00	0.92	0.87	0.82
500	1.10	1.06	1.00	0.92	0.86	0.81

XLPE CABLES

CURRENT RATING FACTORS

RATING FACTORS FOR DEPTH OF LAYING FOR CABLES LAID DIRECT IN THE GROUND								
Depth of Laying (mm)	900	1050	1200	1500	1800	2000	2500	3000 or more
1.1 kV Cable	1.00	0.99	0.97	0.95	0.94	0.93	0.91	0.90

RATING FACTORS FOR VARIATION IN GROUND TEMPERATURE FOR CABLES LAID DIRECT IN THE GROUND								
Ground temperature °C	15	20	25	30	35	40	45	50
Rating factor	1.12	1.08	1.04	1.00	0.96	0.91	0.87	0.82

RATING FACTORS FOR DEPTH OF LAYING SINGLE OR THREE CORE CABLES IN SINGLE WAY DUCTS								
Depth of Laying (mm)	900	1050	1200	1500	1800	2000	2500	3000 or more
1.1 KV Cables	1.00	0.99	0.98	0.96	0.95	0.94	0.93	0.92

RATING FACTORS FOR VARIATION IN GROUND TEMPERATURE FOR CABLES IN THE DUCTS								
Ground temperature °C	15	20	25	30	35	40	45	50
Rating factor (Maximum Conductor Temp. 90°C)	1.12	1.08	1.04	1.00	0.96	0.91	0.87	0.82

RATING FACTORS FOR VARIATION IN AMBIENT AIR TEMPERATURE								
Ambient Air temperature °C	25	30	35	40	45	50	55	60
Rating factor (Maximum Conductor Temp. 90°C)	1.16	1.11	1.06	1.00	0.94	0.88	0.81	0.74

XLPE CABLES

CURRENT RATING FACTORS

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

Number of cables in group	Spacing between trefoil group centres (mm)				
	Touching	200	400	600	800
2	0.76	0.83	0.87	0.90	0.92
3	0.64	0.72	0.79	0.83	0.86
4	0.58	0.67	0.75	0.80	0.84
5	0.53	0.63	0.71	0.77	0.81
6	0.50	0.60	0.69	0.76	0.80
7	0.47	0.58	0.67	0.74	0.79
8	0.45	0.56	0.66	0.73	-
9	0.43	0.55	0.65	0.73	-
10	0.42	0.54	0.64	-	-
11	0.41	0.53	0.64	-	-
12	0.40	0.52	0.63	-	-

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

Number of cables in group	Spacing between trefoil group centres (mm)				
	Touching	200	400	600	800
2	0.81	0.85	0.89	0.91	0.93
3	0.69	0.75	0.81	0.84	0.87
4	0.64	0.69	0.77	0.82	0.85
5	0.59	0.65	0.74	0.79	0.83
6	0.56	0.63	0.72	0.78	0.82
7	0.53	0.60	0.70	0.77	0.81
8	0.51	0.59	0.69	0.76	-
9	0.49	0.57	0.68	0.75	-
10	0.48	0.56	0.67	-	-
11	0.47	0.55	0.66	-	-
12	0.46	0.54	0.66	-	-

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

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

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

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

ELECTRICAL PARAMETERS

SHORT CIRCUIT CURRENT RATING (FOR DURATION OF ONE SECOND)

Nominal cross sectional area of conductor	Aluminium Conductor			Copper Conductor		
	PVC General Purpose Insulation	PVC Heat Resisting Insulation	XLPE Insulation	PVC General Purpose Insulation	PVC Heat Resisting Insulation	XLPE Insulation
sq mm	K.Amp	K.Amp	K.Amp	K.Amp	K.Amp	K.Amp
1.5	0.114	0.103	0.141	0.173	0.156	0.215
2.5	0.190	0.172	0.235	0.288	0.260	0.358
4	0.304	0.275	0.376	0.460	0.416	0.572
6	0.456	0.412	0.564	0.690	0.624	0.858
10	0.760	0.687	0.940	1.150	1.040	1.430
16	1.216	1.099	1.504	1.840	1.664	2.288
25	1.900	1.718	2.350	2.875	2.600	3.575
35	2.660	2.405	3.290	4.025	3.640	5.005
50	3.800	3.435	4.700	5.750	5.200	7.150
70	5.320	4.809	6.580	8.050	7.280	10.010
95	7.220	6.527	8.930	10.925	9.880	13.585
120	9.120	8.244	11.280	13.800	12.480	17.160
150	11.400	10.305	14.100	17.250	15.600	21.450
185	14.060	12.710	17.390	21.275	19.240	26.455
240	18.240	16.488	22.560	27.600	24.960	34.320
300	22.800	20.610	28.200	34.500	31.200	42.900
400	30.400	27.480	37.600	46.000	41.600	57.200
500	38.000	34.350	47.000	57.500	52.000	71.500
630	47.880	43.281	59.220	72.450	65.500	90.090
800	60.800	54.960	75.200	92.000	83.200	114.400
1000	76.000	68.700	94.000	115.000	104.000	143.000

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

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

Note: Total voltage drop in particular length and cable size shall be calculated by multiplying rated current of the cable with length of the cable (km).

APPROXIMATE REACTANCE OF 1.1KV GRADE CABLES AT 50 Hz

Nominal Area of Cond.	PVC Insulated			XLPE Insulated		
	Single Core Cables		Twin & Multicore	Single Core Cables		Twin & Multicore
	Unarmoured	Armoured		Unarmoured	Armoured	
sq mm	Ω / km	Ω / km	Ω / km	Ω / km	Ω / km	Ω / km
6	0.127	0.148	0.096	-	-	-
10	0.118	0.138	0.091	-	-	-
16	0.110	0.128	0.085	-	-	-
25	0.105	0.120	0.083	0.102	0.116	0.080
35	0.100	0.114	0.082	0.097	0.110	0.080
50	1.098	0.110	0.082	0.092	0.103	0.078
70	0.091	0.103	0.076	0.088	0.099	0.077
95	0.088	0.101	0.076	0.085	0.097	0.074
120	0.086	0.096	0.075	0.082	0.093	0.072
150	0.085	0.094	0.074	0.082	0.091	0.072
185	0.084	0.092	0.074	0.082	0.090	0.072
240	0.082	0.090	0.073	0.079	0.086	0.072
300	0.080	0.088	0.073	0.078	0.085	0.071
400	0.080	0.088	0.072	0.077	0.085	0.070
500	0.079	0.087	0.072	0.076	0.083	0.070
630	0.077	0.086	0.072	0.075	0.082	-
800	0.077	0.083	-	0.075	0.081	-
1000	0.076	0.082	-	0.068	0.081	-

ELECTRICAL PARAMETERS

CALCULATED CAPACITANCE VALUES OF 1.1 KV CABLES (μF/km)

Nominal cross sectional area of conductor Sq. mm	PVC Insulated Cables			XLPE Insulated Cables		
	Single Core Cables		Twin and Multicore Cables	Single Core Cables		Twin and Multicore Cables
	Unarmoured	Armoured		Unarmoured	Armoured	
1.5	0.47	0.38	0.20	0.20	0.16	0.08
2.5	0.52	0.43	0.22	0.24	0.19	0.10
4	0.57	0.47	0.25	0.29	0.22	0.12
6	0.67	0.55	0.29	0.34	0.26	0.14
10	0.81	0.66	0.35	0.42	0.31	0.16
16	1.00	0.81	0.40	0.52	0.38	0.19
25	1.05	0.87	0.43	0.52	0.40	0.20
35	1.21	1.00	0.49	0.60	0.46	0.23
50	1.22	1.03	0.51	0.63	0.50	0.25
70	1.43	1.20	0.57	0.68	0.55	0.26
95	1.46	1.25	0.59	0.79	0.63	0.30
120	1.62	1.39	0.66	0.79	0.66	0.30
150	1.62	1.41	0.66	0.79	0.66	0.30
185	1.62	1.42	0.66	0.79	0.66	0.30
240	1.69	1.48	0.68	0.82	0.71	0.32
300	1.72	1.54	0.69	0.85	0.74	0.33
400	1.79	1.59	0.70	0.88	0.74	0.33
500	1.82	1.66	0.70	0.89	0.76	0.35
630	1.86	1.67	0.70	0.92	0.80	0.37
800	1.95	1.73	-	0.96	0.85	-
1000	2.12	1.90	-	0.98	0.85	-

For multicore cables capacitance value given between two adjacent cores.

FORMULAS FOR ELECTRICAL PARAMETER CALCULATIONS

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

COMPARISON BETWEEN XLPE & PVC CABLES				
S.No.	Properties	Unit	XLPE	PVC
1	Chemical structure	-	Thermoset, cross linked	Thermoplastic, linear bonded
2	Polymer structure	-	Partial crystalline	Amorphous
3	Temperature rating			
	a) Operating	°C	90	70
	b) Emergency overload	°C	130	120
	c) Short circuit	°C	250	160
4	Specific gravity	-	0.90 - 0.92	1.35 - 1.55
5	Cable installation work	-	Easy due to less weight, less dia.	-
6	Current carrying capacity	-	Approx. 30% higher than PVC	-
7	Tensile strength	N/mm^2	13 - 16	15 - 20
8	Elongation	%	250 - 450	200 - 325
9	Ageing resistance			
	a) at 100°C	-	Excellent	Moderate
	b) at 120°C	-	Good	Poor
	c) at 150°C	-	Moderate	Very Poor
10	Dielectric breakdown	Kv/mm	35 - 55	15 - 25
11	Volume resistivity	Ohm-cm	More than 10^{15}	$1x10^{13}$ - $5x10^{14}$
12	Thermal resistivity	°C cm/W	350	650
13	Dielectric constant at 20°C	-	2.3	7.4
14	Power factor	-	0.0003	0.08
15	Minimum working temperature	°C	-40	-15
16	Deformation resistance at 150°C	-	Good	Poor
17	Fungus resistance	-	Good	Poor
18	Moisture penetration resistance	-	Excellent	Good
19	Oil resistance	-	Excellent	Fair
20	Solvent resistance	-	Excellent	Poor
21	Acid resistance	-	Excellent	Fair
22	Alkali resistance	-	Excellent	Good
23	Health	-	Neutral	Toxic
24	Ultraviolet light resistance	-	Excellent	Good
25	Overall saving	-	More economic than PVC cable	-

RECOMMENDATION FOR INSTALLATION & TESTING

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

1. Before laying, the insulation of the cable should be checked with a megger as a preliminary check against any transit damage.

2. The drum should always be rolled in the direction of "arrow for rolling" marked on the drum. In the absence of any such mark, the drum should be rolled in the same direction as that of inside end of the cable and opposite to that of the outside end.

3. Where the cable is to be joined with existing cable, the sequence of cores at the two ends to be joined should be in the opposite direction, i.e., if at one end it is in clockwise direction then it should be in anticlockwise direction at the other end. This is necessary to avoid the crossing of cores while jointing. This will also decide the direction in which the cable is to be pulled.

4. During installation of PVC/XLPE insulated heavy duty cables of 1100 V grade, bending radius should not be less than:

   Single core cables: *15 times the overall diameter of cable.*

   Multi core cables: *12 times the overall diameter of cable.*

5. When the cables are laid and joined in very cold regions both the cable and ambient temperatures should be above 0° C and should have remained so for the previous 24 hours. During such conditions the cable should not be bent to very small radius. This is because at very low temperatures PVC compounds become stiff and brittle and likely to crack and shatter when struck hard or bent to small radius.

6. Since a joint is the weakest point of the electric power transmission system all jointing materials and accessories like conductor ferrules, solder, insulating and protective tapes, protective filling compound, joint boxes, etc., should be of right quality and sizes for making the joint and working instructions of the supplier should be followed.

7. **Armoured Cables.** All bonding clamps at the joint terminations and the armour wires should be thoroughly cleaned. The clamps should be adequately tightened. This is necessary to ensure proper electrical contact because armour acts as the return path for Earth fault current.

   Unarmoured Cables. In case of unarmoured cables the external metallic Earth bonding connector used should be of adequate size.

8. **Earth.** All joints, terminations, armour wires and external metallic bonding should be connected to Earth. Wherever possible armour at one end of the cable should be connected to main Earth system at the supplying end by employing metallic conductors.

9. **Filling Compounds.**

   (a) The design of the box and the composition of the filling compound should provide an effective sealing against entry of moisture to conductor ferrules and armour connectors.

   (b) If hot pouring protective compounds are used, the temperature of the compound while pouring should not exceed 150° C.

10. **Proper Drum Handling**

    Protect cables from weather:

    Moisture is essentially injurious to wood. When stored outdoors, reels/ drums tend to get wet and cultivate deteriorating fungus growths. Reels/drums should be kept off the ground so that moisture may not harm the cable reel flanges and laggings. Sound reels are easier to handle and there is less chance of injury to the cable as it is removed from the reel.

    All sites chosen for storage of cable drums should have well drained, hard-packed soil or preferably concrete surface which do not cause the drum to sink, lead to flange rot and extreme difficulty in moving the drums.

Precaution for unloading/laying of cables.

When the drums are unloaded from lorry or wagon, lifting and lowering gear must always be used. If this is not available then the drum should be carefully rolled down on an arranged ramp or rails. While lifting the drum, it is advisable for the lagging to be left in place to prevent the flanges crushing on the cable. The drum should never be dropped as the shock may cause damage to the cable.

The cable, with or without the drum, should not be thrown or dropped on the ground during unloading.

The cable drum should be unloaded with the help of cranes or fork lifts, trucks or by using a proper ramp with an inclination of 1:3 to 1:4 in order to avoid mechanical damage to the outer layer of the cable.

In case the cable is cut into small pieces the cable ends should be sealed properly in order to prevent moisture ingress.

Care should be taken during laying to avoid sharp bending and twisting.

Under no circumstances the cable winding should be lifted off a coil or drum lying flat at the flanges. This can cause serious twist and damage and can twist the cable.

11. **Test before commissioning of a cable.** After the cable is laid and before it is put into service, a DC voltage of 3kV between phases and earth be applied. The voltage should be increased gradually to full value and maintained continuously for 15 minutes. No breakdown in the run of the cable or at the joint should occur during the test.

A view of the fully equipped test laboratory

QUALITY ASSURANCE PROGRAMME

Universal Spares (India) Private Limited employs an in-built Quality Assurance Programme ensuring quality products that conform to Indian/international and customer's specifications. The company focusses on maintaining quality and customer's satisfaction for which a well-experienced and qualified team of engineers, managers at technical, sales planning and testing levels are engaged continuously in:

Activity	Department responsible
a. Techno-commercial study of every incoming enquiry	Technical/Design/Sales
b. Techno-commercial scrutiny of every order	Technical/Design/Sales
c. Preparation of design card to meet customer specification/requirements	Design
d. Purchase of raw materials conforming to specified design standards	Purchase Department
e. Incoming raw-material inspection and testing	Testing and Quality Control
f. Production planning	Planning
g. In-process checking, inspection and testing at each stage of production	Testing and Quality Control
h. Testing of finished goods/products for routine and type tests	Testing and Quality Control
i. Packing and marking	Production
j. Despatch	Stores

Documentation Control System

All incoming enquiries from the sales department are scrutinised by the technical department for technical requirements, construction features, testing, inspection, packing and other specific requirements. The technical department then advises the design section to prepare designs details and raw material requirements and guaranteed technical particulars. On the basis of this information the offer is prepared by the sales department on a prescribed form incorporating all terms and conditions.

On receipt of every order the sales department acknowledges it to the customer and instructs the planning department to plan production. The planning department works out raw materials required and indents the purchase department for procurement according to the planned schedule. After procurement from reputed suppliers and manufacturers raw materials are received by stores and inspected by the quality control and testing department. Various tests, on raw material samples are taken at random, are conducted to ensure their quality. Conforming materials are accepted while non-conforming materials are returned to the supplier.

A job card is issued to production supervisors by a production engineer on the basis of technical department's advice and the product is manufactured. The product is inspected by quality control at all stages such as PVC compounding, wire drawing, annealing, bunching, stranding, extrusion, laying-up, screening, armouring and sheathing. Quality results are given to the production engineer for information and action.

For each stage of production different parameters are used to record dimensional details and other visuals parameters. Feedback is provided to the production-in-charge and testing department at every stage of inspection and proper records are maintained. Routine and type tests, as per relevant ISI and customer specifications, are carried out in the test laboratory on finished products and results for every individual lot is maintained for future reference.

Only products conforming to relevant specifications/requirements by the testing department are transferred for packing and despatch. The rest are sent back to the production department for defect-rectification wherever possible. Products beyond rectification are scrapped.

All testing equipment is calibrated periodically for accurate results.

The testing and quality control department is the final authority for the release of finished products to packing and despatch department.

EVEREST® HOUSE WIRING CABLES

EVEREST® house wiring cables is a trusted name today for reliable electrical wiring in homes, offices, multistoried buildings, hospitals, hotels, schools and industries, etc., enjoying an enviable reputation for its quality and reliability. EVEREST® wires are manufactured from best quality, bright annealed electrolytic grade copper with conductivity of more than 99.997% for smooth flow of electricity thus saving energy consumption. PVC used as an insulant is manufactured in-house and has good dielectric and physical properties with high insulation resistance value that protects against any electrical fault.

EVEREST® wires are manufactured with solid, stranded and multi-stranded conductor.

The flawless quality of EVEREST® wires and cables is continuously upgraded for consistence performance and long service life. No wonder then that they are called "***THE NO PROBLEM CABLES".***

RANGE

Fire Retardant (FR) Our normal wires are fire retardant with a high oxygen and temperature index that helps in restricting the spread of fire even at high temperatures.

Fire Retardant Low Smoke (FRLS) Apart from a high oxygen and temperature index our FRLS wires also have low smoke and toxic gases generation properties that help in easy evacuation and rescue operations in case of fire and are ideal for use in places of high human density.

Heat Resistant (105°C) Besides being fire retardant our heat resistant (105°C) cables can withstand excess heat generated within the wire due to low voltage. These wires can handle conductor temperatures up to 105°C and are suited for areas with wide voltage fluctuations.

Zero Halogen Flame Retardant ('0' HFR) Based on Poly-olefinic thermoplastic compound, our Zero Halogen Flame Retardant wires emit smoke-free, non-toxic, non-corrosive gases in case of fire besides other fire retarding properties. They are ideal for use in public places where risk of human lives and property are of prime concern.

WHY EVEREST® WIRES ARE BETTER

Purity. Our copper has more than 99.997% conductivity which means reduction in electricity bills.

Uniformity. We have the most advanced, in-house wire drawing, stranding and bunching facilities to give a uniform lay and smooth finish of the conductor.

Better Flexibility. Uniform annealing of copper provides more flexibility.

Double Insulated. A thin coloured layer is only on the surface for colour identification. The thick layer of natural virgin PVC underneath which provides improved insulation resistance value.

Centre Perfect. Automatic self-centering head coupled with on-line diameter controller maintains the conductor perfectly in the centre of PVC insulation to prevent short-circuit occurrences due to uneven thickness and eccentricity of insulation.

Consistency. All wires pass through the spark tester to withstand high voltage stresses of 9000 volts for consistent quality, free of foreign particles through out.

Current Carrying Capacity. Higher current carrying capacity owing to low conductor resistance.

ELECTROLYTIC GRADE COPPER

SPECIALLY FORMULATED PVC FORMULATED IN-HOUSE

FIRE RETARDANT (FR) - MULTI-STRANDED CONDUCTOR

EVEREST® PVC INSULATED UNSHEATHED SINGLE CORE WIRE WITH HIGH CONDUCTIVITY PLAIN ANNEALED ELECTROLYTIC GRADE COPPER CONDUCTOR 1100 VOLTS GRADE CONFORMING TO IS : 694/1990 (ISI MARKED)

Nominal cross sectional area of the conductor	Nos. / Nominal dia. of strand	Nominal thickness of insulation	Approx. overall dia.	Max. conductor resistance	Current Rating (amps) 2 wires, single phase	
sq mm	no / mm	mm	mm	Ω/km at 20° C	In Conduit/ Trunking	Clipped directly to surface or on cables tray
1.0	* 14/.3	0.7	2.8	18.1	11	12
1.5	* 22/.3	0.7	3.1	12.1	13	16
2.5	* 36/.3	0.8	3.8	7.41	18	22
4.0	** 56/.3	0.8	4.3	4.95	24	29
6.0	** 84/.3	0.8	5.2	3.30	31	37

Note :
- Current rating at ambient temp. 40° C
- Current rating as per IS : 3961 (Part V)
- PVC insulation : Type 'A' as per IS : 5831 - 1984
- Normal packing length - 90 metres

* Conductor : Class 2 as per IS : 8130-1984
** Conductor : Class 5 as per IS : 8130-1984

SOLID/STRANDED CONDUCTOR

EVEREST® PVC INSULATED UNSHEATHED SINGLE CORE WIRE WITH HIGH CONDUCTIVITY PLAIN ANNEALED COPPER CONDUCTOR 1100 VOLTS GRADE CONFORMING TO IS : 694/1990 (ISI MARKED)

Nom. cross-sectional area of conductor	Nos/nominal dia of strand	Nominal thickness of insulation	Approx. over all dia	Max. conductor resistance	Current Rating (amps) 2 wires, single phase	
sq mm	no/mm	mm	mm	Ω/km at 20° C	In conduit/trunking	Clipped directly to surface or on cable tray
*1.0	1/1.13	0.7	2.8	18.1	11	12
*1.5	1/1.38	0.7	3.0	12.1	13	16
**1.5	7/0.52	0.7	3.1	12.1	13	16
*2.5	1/1.78	0.8	3.6	7.41	18	22
**2.5	7/0.67	0.8	3.8	7.41	18	22
*4.0	1/2.25	0.8	4.1	4.61	24	29
**4.0	7/0.85	0.8	4.3	4.61	24	29
*6.0	1/2.76	0.8	4.6	3.08	31	37
**6.0	7/1.04	0.8	5.2	3.08	31	37
**10.0	7/13.5	1.0	6.3	1.83	42	51
**16.0	7/1.70	1.0	7.3	1.15	57	68
**25.0	7/1.70	1.2	9.0	0.727	71	86
**35.0	7/2.14	1.2	10.2	0.524	91	110
**50.0	7/2.52	1.4	12.0	0.387	120	145

Note :
- Current rating at ambient temp. 40°C
- Current rating as per IS:3961 (part V)
- Normal delivery length - 100 metres
- PVC Insulation - Type A (IS : 5831/1984)

* Conductor: Class 1 as per IS:8130-1984
** Conductor: Class 2 as per IS:8130-1984

STRANDED CONDUCTOR

EVEREST® PVC INSULATED UNSHEATHED SINGLE CORE WIRE WITH HIGH CONDUCTIVITY PLAIN ANNEALED ELECTROLYTIC GRADE COPPER CONDUCTOR 1100 VOLTS GRADE CONFORMING TO IS : 694/1990 (ISI MARKED)

Nominal cross sectional area of the conductor	Nos. / Nominal dia. of strand	Nominal thickness of insulation	Approx. overall dia.	Max. conductor resistance	Current Rating (amps) 2 wires, single phase
sq mm	no / mm	mm	mm	Ω/km at 20° C	In Conduit/ Trunking
1.0	14/0.3	0.7	2.8	18.1	11
1.5	22/0.3	0.7	3.1	12.1	13
2.5	36/0.3	0.8	3.8	7.41	18
4.0	56/0.3	0.8	4.3	4.61	24
6.0	84/0.3	0.8	5.2	3.08	31
10.0	80/0.4	1.0	6.3	1.83	42
16.0	126/0.4	1.0	7.3	1.15	57
25.0	196/0.4	1.2	9.0	0.727	71
35.0	276/0.4	1.2	10.2	0.524	91
50.0	396/0.4	1.4	12.0	0.387	120
70.0	360/0.50	1.4	15.5	0.272	215
95.0	475/0.50	1.6	18.0	0.206	260
120.0	608/0.50	1.6	19.5	0.161	305
150.0	756/0.50	1.8	22.0	0.129	355
185.0	925/0.50	2.0	24.5	0.106	415
240.0	1221/0.50	2.2	28.0	0.0801	500

Note :
- Current rating at ambient temp. 40° C
- Current rating as per IS : 3961 (Part V)
- PVC insulation : Type 'A' as per IS : 5831 - 1984
- Normal packing length - 100 metres

Conductor: Class 2 as per IS:8130-1984

FLEXIBLE WIRES

EVEREST® PVC INSULATED UNSHEATHED SINGLE CORE FLEXIBLE WIRES WITH HIGH CONDUCTIVITY PLAIN ANNEALED ELECTROLYTIC COPPER CONDUCTOR 1100 VOLTS GRADE CONFORMING TO IS : 694/1990 (ISI MARKED)

Nom. cross-sectional area of conductor	Nos/nominal dia of strand	Nominal thickness of insulation	Approx. over all dia	Max. conductor resistance	Current Rating
sq mm	no/mm	mm	mm	Ω/km at20° C	amps
0.50	16/0.20	0.6	2.4	39.0	4
0.75	24/0.20	0.6	2.6	26.0	7
1.00	32/0.20	0.6	2.7	19.5	12
1.50	*30/0.25	0.6	3.1	13.3	16
2.50	*50/0.25	0.7	3.8	7.98	22
4.00	56/0.30	0.8	4.3	4.95	29
6.00	84/0.30	0.8	5.2	3.30	37
10.00	80/0.40	1.0	6.3	1.91	51
16.00	126/0.40	1.0	8.0	1.21	68
25.00	196/0.40	1.2	9.7	0.780	86
35.00	276/0.40	1.2	11.0	0.554	110
50.00	396/0.40	1.4	13.2	0.386	145

Note :
- Current rating at ambient temp. 40°C
- Current rating as per IS:3961 (part V)
- Normal delivery length - 100 metres
- PVC Insulation - Type A (IS : 5831/1984)
- Conductor: Class 5 as per IS:8130-1984

* 30/0.25mm and 50/0.25mm sizes can be supplied on request with construction of 48/0.20mm and 80/0.20mm respectively

MULTICORE FLEXIBLE CABLES

EVEREST® PVC INSULATED AND PVC SHEATHED SINGLE AND MULTI CORE FLEXIBLE CABLE WITH HIGH CONDUCTIVITY PLAIN ANNEALED ELECTROLYTIC GRADE COPPER CONDUCTOR 1100 VOLTS GRADE CONFORMING TO IS : 694/1990 (ISI MARKED)

Nom. cross sectional area of conductor	Nos/nominal dia of strand	Nominal Thickness of Insulation	Single Core		Two Core		Three Core		Four Core	
			O.D. (max)	Sheath Thickness	O.D. (max)	Sheath Thickness	O.D. (max)	Sheath Thickness	O.D. (max)	Sheath Thickness
sq mm	mm	Copper	mm	mm	mm	mm	mm	mm	mm	mm
0.50	16/.20	0.60	4.50	0.90	7.20	0.90	7.60	0.90	8.20	0.90
0.75	24/.20	0.60	4.70	0.90	7.80	0.90	8.20	0.90	8.80	0.90
1.00	32/.20	0.60	4.90	0.90	8.00	0.90	8.60	0.90	9.40	0.90
1.50	*30/.25	0.60	5.40	0.90	8.60	0.90	9.20	0.90	10.50	1.00
2.50	*50/.25	0.70	6.20	1.00	10.50	1.00	11.00	1.00	12.00	1.00
4.00	56/.30	0.80	7.00	1.00	12.00	1.00	12.50	1.00	14.00	1.00

Note :
- Current rating at ambient temp. 40°C
- Current rating as per IS:3961 (part V)
- Normal delivery length - 100 metres
- Conductor: Class 5 as per IS:8130-1984
- PVC Insulation - Type A (IS : 5831/1984)
  PVC Sheath - Type ST-1 (IS : 5831/1984)

HEAT RESISTANT - 105° C

Voltage fluctuations in power supply systems are a common phenomenon owing to an increase in power demand. When the voltage is low, the current in the wire increases abnormally causing excess overheating of the cabless. EVEREST® Heat Resistant (105° C) Wires can withstand temperatures of up to 105° C to overcome this problem.

The main characteristics of EVEREST® Heat Resistant (105° C) Wires:

- **Superior insulation resistance and high di-electric strength**
- **Superior heat resistance properties**
- **Higher operating temperature**
- **Higher current carrying capacity.**

EVEREST® HR PVC INSULATED UNSHEATHED SINGLE CORE WIRE WITH HIGH CONDUCTIVITY PLAIN ANNEALED COPPER CONDUCTOR 1100 VOLTS GRADE CONFORMING TO IS : 694/1990 (ISI MARKED)

Nom. cross-sectional area of conductor	Nos/nominal dia of strand	Nominal thickness of insulation	Approx. over all dia	Max. conductor resistance	Current Rating (amps) 2 wires, single phase	
sq mm	no/mm	mm	mm	Ω/km at 20° C	In conduit/trunking	Clipped directly to surface or on cable tray
1.0	*14/0.3	0.7	2.8	18.1	12	13
1.5	*22/0.3	0.7	3.1	12.1	14	17
2.5	*36/0.3	0.8	3.8	7.41	19	24
4.0	**56/0.3	0.8	4.3	4.95	26	31
6.0	**84/0.3	0.8	5.2	3.30	34	40

Note :
- Current rating at ambient temp. 40°C
- Normal delivery length - 90 metres

* Conductor: Class 2 as per IS:8130-1984
** Conductor: Class 5 as per IS:8130-1984

FIRE RETARDANT LOW SMOKE (FRLS)

Casualties occur, in a fire mishap, due to suffocation and inhalation of toxic fumes/gases rather than burns. Also, the dense black smoke reduces visibility thereby hampering evacuation and rescue operations. This is where EVEREST® FRLS wires are the right choice to minimise damage.

Their main characteristics are :

- **Superior fire retardant properties,**
- **Emit non-toxic fumes,**
- **Self extinguishing,**
- **Emit lesser amount of non-corrosive smoke.**

These cables are ideal for use in places of high human density, i.e., high-rise buildings, theatres, hospitals, hotels, schools, etc., where safety is a primary concern.

The special FRLS PVC compound used in EVEREST® FRLS cables, formulated and manufactured inhouse, is mechanically stronger with a definite advantage over ordinary PVC cables in terms of critical oxygen index, temperature index, smoke density and acid gas generation, thus ideal for concealed as well as conduit wiring.

SPECIAL TESTS ON EVEREST® FRLS WIRES

Test	Function	Specification	Specified Values & Test	Obsd. values
Critical Oxygen Index	To determine percentage of oxygen required for supporting combustion at room temperature of insulating material.	ASTM-D-2863	Oxygen Index : minimum 29% Test sample 7 to 15 cm long by 6.5 ± 0.5 mm wide and over 3 ± 0.5 mm thick in a minimum concentration of oxygen and nitrogen mixture will just support candle like burning at room temperature.	More than 32
Temp. Index	To determine at what temp. normal oxygen content of 21% in air will support combustion of insulating material.	ASTM-D-2863	Temperature Index : minimum 250°C The aforesaid procedure at various temperatures and then extrapolating to 250°C.	Around 285°C
Smoke Density	To determine the visibility (light transmission) under fire of insulating material.	ASTM-D-2843	Light Transmission : minimum 40% The test sample is exposed to flame at 40 psi pressure for 4 minutes; the light absorption data plotted on a graph as smoke density (%) versus time.	Around 45%
Acid Gas Generation	To ascertain the amount of hydrochloric acid gas evolved from PVC insulation of wire under fire conditions.	IEC 754 - 1	Hydrochloric acid gas released : 20% max. 0.5-1 gram of the material from the wire insulation/sheath is burnt in a ceramic tube inside a tubular furnace at 800°C. The volume of corrosive gases (HCl) present in the combustion products are analysed chemically.	Around 15%
Flammability test on group of cables	To determine flame propagation of wires in installed conditions	IEEE - 383	In total 20 minutes of burning 8 feet wire length samples with flame temp. of approx. 1500°F, the burning of wires should not go to the top.	Satisfactory
Flammability test	1) To determine ignition resistance and flame propagation under specified conditions	Swedish standard no. SS-424-175 (class F3)	From test sample of 850 mm length, the unburnt portion shall be more than 300mm from the top	Satisfactory
	2) To determine ignition resistance and flame propagation under specified conditions	IEC-332-1	In the calculated time duration of burning the wire sample of 600mm ±25mm length, the length of unburnt portion to be min. 50mm from the top	Satisfactory
	3) To determine ignition resistance and flame propagation, especially for bunch of wires under specified conditions	IEC-332-3	From test sample of 3.5m length effected portion during burning, shall not reach 2.5m above from the bottom edge of the burner.	Satisfactory

ZERO HALOGEN FLAME RETARDANT ('0'HFR)

Based on Poly-olefinic thermoplastic compound, EVEREST® '0'HFR wires have properties to emit smoke free, non-toxic, non-corrosive gases in case of fire, besides other fire retarding properties. They are ideal for use in public places where risk of human lives and property are of prime concern.

The special '0'HFR compound used in EVEREST® wires which is imported from Europe is mechanically stronger and has a definite advantage over normal PVC/FRLS wires in terms of critical oxygen index, smoke density, temperature index and acid gas generation, thus ideal for concealed as well as conduit wiring.

The main characteristics of Zero Halogen Flame Retardant ('0'HFR) wires are :

1. Emits very less smoke : The generation of smoke causes obstruction at exits and distracts safe evacuation of people and makes fire fighting a tedious task. '0'HFR wires emits very less smoke to overcome this problem.

2. Negligible toxic gases : Concentration of toxic gases generated by fire depends on the material under combustion, oxygen available, temperature of the fire and ventilation systems. Some toxic gases are undetectable in low concentration by human senses, hence can not be tasted, seen or smelt and can prove to be lethal. '0'HFR wires contain zero halogen materials and thus overcome severe toxicity problem.

3. Negligible corrosive gases : Hydrogen chloride gases are generated during the combustion of PVC which weakens the steel structures and RCC, even electronic equipment & computer network system may be destroyed. As buildings and equipments require heavy investment, to protect them is also very important. '0'HFR wires generate negligible corrosive gases on burning.

4. Fire resistant : Basic requirements for a fire to erupt are heat, fuel & oxygen. '0'HFR wires have high oxygen index value, which minimize the spread of fire. '0'HFR wires contain fire retardant properties which are self extinguishing.

COMPARISON BETWEEN EVEREST® FR, FRLS AND '0' HFR WIRES

Test	Standard	Unit	Requirements	FR	FRLS	'0'HFR
Critical Oxygen Index	ASTM - D - 2863	%	Min. 29	30 - 32	30 -32	> 40
Temperature Index	ASTM - D - 2863	°C	Min. 250	260 - 300	280 - 350	> 350
Light Transmission	ASTM - D - 2843	%	Min. 40	30 - 33	42 - 45	> 75
Halogen Gas Generation	IEC - 754 - I	%	Max. 20	30 - 35	15 - 18	< 0.1
Thermal Decomposition	-	-	-	Good	Good	Excellent
Flame Retardency	-	-	-	Good	Good	Excellent
Safety During Burning	-	-	-	Average	Good	Excellent

COLOUR CODE

Normally the following colour code is used in the manufacturing of cables:

House wiring cables

Single core unsheathed	:	Red, yellow, blue, white, or grey, and green (for earth)
Single core sheathed	:	Core black and sheath white.

Flexible Cables

Twin Twisted	:	Red and black
Twin Parallel	:	Black with red lining
Two Core Sheathed	:	Red and black
Three Core Sheathed	:	Red, black and green
Four Core Sheathed	:	Red, yellow, blue and green
Outer Sheath	:	Black or grey

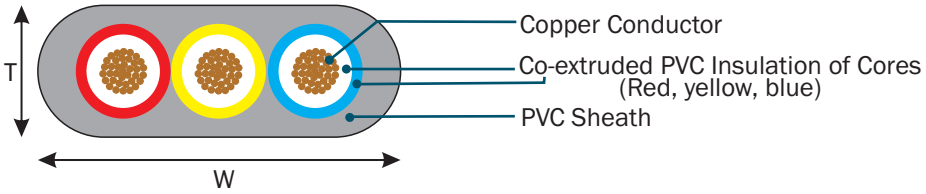
3 CORE FLAT CABLES FOR SUBMERSIBLE PUMP MOTORS

EVEREST® 3 Core Flat Cables are manufactured for critical space requirement, protection against indefinite immersion in water under specified conditions, protection against rain water and ingress of small, solid foreign bodies.

EVEREST® 3 Core Flat Cables are produced from best quality electrolytic copper which is drawn, annealed on-line and bunched on automatic machines to ensure flexibility and uniform resistance. The conductors are insulated with a special grade of PVC on sophisticated co-extrusion lines. Outer sheath consists of highly abrasion resistance PVC compound impervious to grease, oil and water, etc.

3 CORE FLAT CABLES (AS PER IS : 694)

Conductor		Insulation		Sheath (Overall Dimensions)		Conductor Resistance @20°C (max.)	Current Carrying Capacity @40°C
Area (nom.)	No/dia of strands	Thickness (nom.)	Core dia (nom.)	Thickness (nom.)	Size (approx.) (WxT)		
sq mm	mm	mm	mm	mm	mm	Ω/km	amps
1.5	22/0.3	0.6	2.8	0.9	11.5 x 5.4	12.10	16
2.5	36/0.3	0.7	3.4	1.0	14.0 x 6.4	7.41	22
4.0	56/0.3	0.8	4.1	1.0	16.3 x 7.2	4.95	29



3 CORE FLAT CABLES (GENERALLY CONFORMING IS : 694)

Conductor		Insulation	Sheath (Overall Dimensions)		Conductor Resistance @20°C (max.)	Current Carrying Capacity @40°C
Area (nom.)	No/dia of strands	Thickness (nom.)	Thickness (nom.)	Size (approx.) (WxT)		
sq mm	mm	mm	mm	mm	Ω/km	amps
6	84/0.3	0.8	1.1	18.0 x 8	3.30	37
10	80/0.4	1	1.2	22.5 x 9.6	1.91	51
16	126/0.4	1	1.3	26.5 x 11.0	1.21	68
25	196/0.4	1.2	1.5	32.5 x 13.5	0.78	86
35	276/0.4	1.2	1.6	36 x 15	0.554	110
50	396/0.4	1.4	1.7	41.5 x 17.0	0.386	145

Note : 3 Core x 70 sq mm & 3 Core x 95 sq mm Flat Cables are available on request.

SPECIAL (AS PER IS : 694)

Conductor		Insulation	Sheath (Overall Dimensions)		Conductor Resistance @20°C (max.)	Current Carrying Capacity @40°C
Area (nom.)	No/dia of strands	Thickness (nom.)	Thickness (nom.)	Size (approx.) (WxT)		
sq mm	mm	mm	mm	mm	Ω/km	amps
1.5	22/0.300	0.75	1.1	11.35 x 5.25	12.10	16
2.5	36/0.300	0.9	1.2	13.85 x 6.15	7.41	22
4.0	56/0.300	1.0	1.4	15.8 x 6.8	4.95	29

Note : Insulation thickness, Sheath thickness and Overall Dimensions given in this table are nominal values. The strand diameter is nominal. However, construction of the conductor is designed to satisfy the requirement of conductor resistance as per IS 8130 : 1984.

SELECTION GUIDE FOR 3 CORE FLAT CABLES

1) HP Vs Current : The full load current for submersible pump motors, 3 phase, 50 cycle, 415 425V.

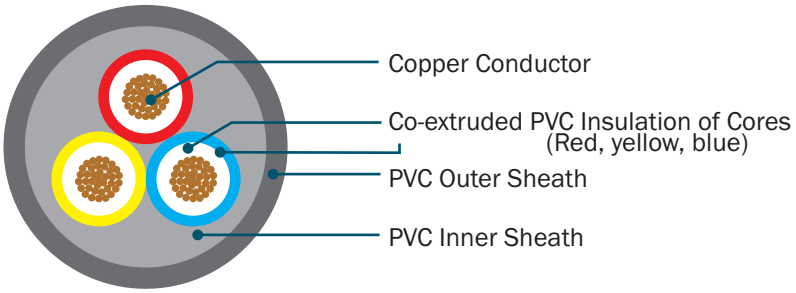
HP	5.0	7.5	10.0	12.5	15.5	17.5	20.0	25.0	30.0	35.0	40.0	45.0	50.0	55.0	60.0	65.0	70.0	75.0	80.0
Amp	7.5	11.0	14.9	18.9	22.5	25.2	28.4	35.6	42.3	50.4	58.1	62.1	67.5	73.8	81.0	87.3	93.6	100.8	108.0

2) Derating Factors : Multiply the current carrying capacity of the cable by factors given below for various ambient temperatures.

Ambient Temperature °C	30	35	40	45	50
Rating Factor	1.09	1.04	1.00	0.95	0.77

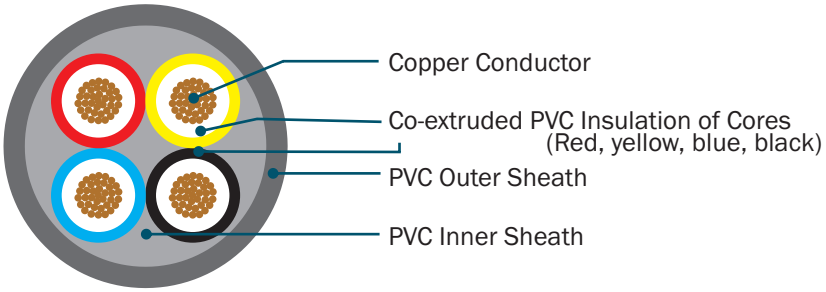
DOUBLE SHEATHED ROUND SUBMERSIBLE CABLES

Double Sheathed Round 3 Core and 4 Core Cables are better suited for heavy duty applications like sewage, slurry and dewatering pumps. The operating conditions require the sheathing to be able to withstand abrasion, prevent ingress of water and be resistant to acidic fluids and chemicals.



3 CORE & 4 CORE ROUND CABLES (GENERALLY AS PER IS : 694)

Conductor			Radial thickness of Insulation (Nom.)	Thickness of inner sheath approx.		Thickness of outer sheath nominal		Overall diameter nominal	
Area	Number and size of wire			3 core	4 core	3 core	4 core	3 core	4 core
Sq.mm	mm		mm	mm	mm	mm	mm	mm	mm
1.5	30/0.25	-	0.6	1.0	1.0	1.2	1.2	10.8	12.0
2.5	50/0.25	-	0.7	1.0	1.0	1.2	1.2	13.2	13.8
4	56/0.30	-	0.8	1.0	1.0	1.2	1.4	14.2	15.2
6	84/0.30	-	0.8	1.0	1.0	1.4	1.4	16.5	18.5
10	140/0.30	-	1.0	1.0	1.0	1.4	1.4	19.1	22.0
16	226/0.30	126/0.40	1.0	1.0	1.0	1.4	1.4	23.5	25.0
25	354/0.30	196/0.40	1.2	1.0	1.0	1.6	1.6	28.5	31.0
35	494/0.30	276/0.40	1.2	1.0	1.0	2.0	2.0	30.5	32.8
50	703/0.30	396/0.40	1.4	1.0	1.0	2.2	2.2	35.9	39.2



Note : 4 Core and 5 Core Cables up to 4 sq mm are also available on request.

TELEPHONE AND SWITCH BOARD CABLES

EVEREST® telephone and switch board cables are widely used today for communication in high rise buildings, offices, factories, hotels, hospitals, residential complexes, etc., has gained confidence, support and vast goodwill among users.

EVEREST ® telephone and switch board cables are made of high conductivity electrolytic grade annealed tinned solid copper conductor with nominal dia. of 0.5, 0.6 & 0.7mm. The insulant is of hard grade PVC as per IS : 13176 (1991) type 2 and are properly colour coded. The insulated cores are twisted with a suitable lay to form a pair. The pairs are bunched together in a manner to minimise cross talk. These bunched pairs are then wrapped with polyester tape, further jacketed with grey colour fire retardant PVC along with nylon rip cord. EVEREST® telephone and switch board cables are manufactured as per ITD specification S/WS 113 B, 113 C & 114 B and TEC specification No. GR/WIR-06/03(screened/unscreened) suitable for indoor telephone wiring, switch boards and intercoms. These wires are tested at 2000 volts.

Salient Features

- Low cross-talk
- Low attenuation
- Fire retardant
- High speed transmission

Technical Data

Conductor dia : 0.5mm (nom.) Conductor resistance : 92.20Ω/km (max.) Insulation thickness : 0.2 mm (nom.)			0.6 mm (nom.) 64Ω/km (max.) 0.2 mm (nom.)				0.7 mm (nom.) 45.7Ω/km (max.) 0.28 mm (nom.)			
S/WS - 113 B			S/WS - 113 C		S/WS - 113 B		S/WS - 113 C		S/WS - 114 B	
Pair	Sheath thickness (min.)	O.D. (max.)	Sheath thickness (min.)	O.D. (max.)	Sheath thickness (min.)	O.D. (max.)	Sheath thickness (min.)	O.D. (max.)	Sheath thickness (min.)	O.D. (max.)
1	0.6	3.5	0.50	3.5	0.6	3.7	0.50	3.5	0.65	4.3
2	0.6	5.3	0.65	5.3	0.6	5.6	0.65	5.7	0.65	5.2
3	0.6	5.6	0.65	5.6	0.6	6.6	0.65	6.2	0.65	6.9
4	0.6	6.1	0.65	6.1	0.6	7.0	0.65	7.2	0.65	7.9
5	0.6	6.6	0.65	6.7	0.6	7.6	0.65	7.8	0.65	8.7
6	0.6	6.8	0.65	6.8	0.6	7.8	0.65	7.8	0.65	9.2
10	0.6	8.6	0.75	9.0	0.6	9.1	0.75	10.0	0.75	10.4
15	0.75	10.1	0.75	10.4	0.75	10.7	0.75	10.8	0.75	12.3
20	0.75	11.2	0.75	11.5	0.75	11.7	0.75	11.8	0.90	14.0
25	0.75	11.4	0.75	11.5	0.75	12.7	0.75	12.0	0.90	15.4
30	0.75	12.6	0.75	12.7	0.85	13.2	0.90	13.5	1.0	16.9
40	0.90	15.0	0.90	16.0	1.1	16.2	1.1	16.2	1.1	17.1
50	1.1	16.2	1.1	16.2	1.1	18.3	1.1	18.5	1.1	21.2
75	1.1	18.3	1.1	19.6	1.3	21.1	1.3	21.1	1.4	26.1
100	1.4	22.8	1.4	23.0	1.4	24.6	1.4	24.6	1.8	28.6
200	1.8	32.4	1.8	33.0	1.8	35.6	1.8	35.6	-	-

Normal delivery length : 100 mtrs upto 20 pair.

RADIO FREQUENCY COAXIAL CABLES

Signal transmission in electronic applications and data communications cables now have to accommodate faster signal speeds over longer distance with less signal loss. In addition, new shielding requirements to meet FCC RFI/EMI emission controls, tougher fire/temprature requirements requiring special materials in critical installations and demands for high density wiring are factors that have been considered in many of our coaxial and data cable products. Our products are designed to meet these needs for safe and reliable transmission of voice, video and data.

Our EVEREST® brand coaxial cable produced are supplied in 50, 75 and 93 ohm impedance grades for most voice, video and data applications. Our comprehensive line includes :

- Standard RG/URM/JSS/JIS Type Coax for commercial and defence use.
- Triaxial cables-balanced lines for reduced crosstalk.
- MATV and CATV Cables.
- Networking load for LAN, WAN, ETHERNET, ARCNET, NOVEL LAN, DLINK and other complex applications.
- Dual Coax-workstation Coax for large word processing System.

CHARACTERISTICS

Item (Replaces)	Conductor Size	Dia. over Dielectric	O.D.	Impedance	Attenuation (db / 100m 200MHz)	Max. RF Operating Voltage
	(NORMAL VALUES)					
	mm	mm	mm	Ω		kV
CHARACTERISTIC IMPEDANCE 50-55 OHMS						
RG- 174/U	7/0.16 (P)	1.5	2.5	50	40	1.5 rms
RG- 122 / U	27/0.127 (T)	2.4	4.1	50	36	1.9 rms
RG- 58/U	0.81 (P)	2.95	5.0	53.5	23	1.9 rms
RG- 58 C/U	19/0.18 (T)	2.95	5.0	50	24	1.9 rms
URM-43 (UR-43)	0.9 (P)	2.95	5.0	50	19	2.6 peak
URM-76 (UR-76)	7/0.32 (P)	2.95	5.0	50	22	2.6 peak
RG-55B/U	0.81 (S)	2.95	5.2	53.5	20	1.9 rms
RG- 223 / U (RG- 55A/U)	0.9 (S)	2.95	5.5	50	20	1.9 rms
URM- 115	0.9 (P)	2.95	7.2	50	19	2.0 peak
RG- 212 / U (RG-5B /U)	1.2 (S)	4.7	8.4	50	14	3.0 rms
RG-213-U (RG-8A/U)	Similar to and substitutes URM-67 and UR - 67 7/0.75 (P)	7.25	10.3	50	11	5.0 rms
RG - 214 - U (RG-9B/U)	Similar to and substitutes URM-112 and UR - 112 7/0.75 (S)	7.25	10.8	50	11	5.0 rms
URM-91 (UR-91)	7/0.76 (P)	7.25	11.0	50	10	6.5 peak
RG - 217/U (RG-14A/U)	2.7 (P)	9.4	13.8	50	7	7.0 rms
RG - 218/U (RG - 17A/U)	Similar to and substitutes URM-74 and UR - 74 4.95 (P)	17.3	22.1	50	4	11.0 rms

CHARACTERISTICS

Item (replaces)	Conductor Size	Dia over Dielectric	O.D.	Impedance	Attenuation (db / 100m 200MHz)	Max R.F. Operating Voltage
	(NORMAL VALUES)					
	mm	mm	mm	Ω		kV
CHARACTERISTIC IMPEDANCE 70-75 OHMS						
URM-200	7/0.2 (P)	2.45	4.1	75	23	Foam PE dielectric
URM-201	0.71 (P)	3.25	5.1	75	16	-do-
URM-202	7/0.25 (P)	3.25	5.1	75	16	-do-
URM-210	7/0.19 (P)	3.25	5.8	75	22	-do-
URM-70 (UR-70)	7/0.19 (P)	3.25	5.8	75	22	1.8 peak
UR-56	0.56 (P)	3.25	5.9	71	18	2.5 peak
URM-117	7/0.212 (P)	3.7	6.0	75	18	2.6 peak
RG-59B/U	0.58 (P)	3.7	6.1	75	16	2.3 rms
RG-59/U	0.63 (P)	3.7	6.2	73	16	2.3 rms
URM-203	1.12 (P)	5.1	7.3	75	11	Foam PE dielectric
URM-204	1.25 (P)	5.6	7.8	75	10	-do-
UR-54	7/0.193 (P)	3.25	8.3	72	22	1.8 peak
URM-206	1.4 (P)	6.35	8.7	75	8	Foam PE dielectric
RG-11 A/U	7/0.41 (P)	7.25	10.3	75	11	5.0 rms
UR-59	1.12 (P)	7.25	10.3	75	9	5.0 peak
URM-65 (UR-65)	1.15 (P)	7.25	10.3	75	9	5.0 rms
RG-216/U (RG-13 A/U)	7/0.41 (T)	7.25	10.8	75	15	5.0 rms
UR-21	1.42 (P)	8.4	11.5	71	8	5.0 peak
UR-60	1.12 (P)	7.25	11.7	75	9	5.0 peak
RG-34B/U	7/0.64 (P)	11.70	16.0	75	7	6.5 rms
URM-77 (UR-77)	Similar to and substitutes RG - 164/U					
	2.65 (P)	17.3	22.0	75	5	12.5 peak
CHARACTERISTIC IMPEDANCE 90-125 OHMS						
RG-62 A/U (Semi-Air Spaced)	0.64 (P)	3.7	6.1	93	12	0.75 rms
RG-71 B/U (Semi-Air Spaced)	0.64 (P)	3.7	6.4	93	12	0.75 rms
RG-63 B/U (Semi-Air Spaced)	0.64 (P)	7.25	10.3	125	9	1.00 rms
RG-22/U	2x7./0.38 (P)	7.25	10.3	95	20	1.00 rms
UR-78	0.61 (P)	7.25	10.3	100	11	3.7 rms
RG-57 A/U Twin Conductor	2x7/0.12 (P)	12.0	15.9	95	12	3.0 rms

P=Plain Copper. T=Tinned Copper. S=Silver Plated.
Colour: Sheathing-Grey/Black/White.
Packing: In 50/100 m coil.

Note
If you have a new or unusual application or if you cannot find a cable in this section which meets your requirements then contact us.
We can design a custom-made cable for you.

CATV CO-AXIAL CABLES

EVEREST® co-axial cables are widely used today for hi-tech multi-channel cable TV networks in high rise buildings, offices, hotels, hospitals residential complexes, etc., and has gained confidence among viewers by delivering high quality picture and sound.

EVEREST® co-axial cables are made of high conductivity electrolytic grade annealed bare solid copper conductor with special grade polyethylene/gas injected physical foam PE dielectric. Bonded aluminium foil screening in combination with tinned copper braiding, jelly-filled ensures low loss in signal quality and clear pictures. The double screening provides better attenuation values compared with cable with single screen. After screening, the outer jacket is extruded with special grade PVC which is UV and abrasion resistant. Excellent adhesion of insulant to conductor, as well as bonded aluminium foil to dielectric does not allow the moisture to enter the cable. This makes it ideal for use in tropical conditions.

Salient Features

- Low attenuation values
- High band width
- Minimum structural return loss
- Moisture-proof
- Low loss in signal quality
- Excellent adhesion

Technical Data

Construction Parameters	Unit	RG 59 F	RG 6 F	RG 11 F
Inner Conductor Nom. Dia.	mm	Solid Bare Copper 0.8	Solid Bare Copper 1.02	Solid Bare Copper 1.63
Dielectric Nom. Dia.	mm	Foam PE 3.55	Foam PE 4.57	Foam PE 7.11
Outer Conductor 1st Shield 2nd Shield Min. Coverage	%	Bonded Al Tape Alloy Braid 60	Bonded Al Tape Alloy Braid 60	Bonded Al Tape Alloy Braid 60
Jacket Nom. Dia.	mm	PVC (Black) 6.2	PVC (Black) 7.2	PVC (Black) 10.5
Bending radius (min.)	mm	65	65	75
Electrical Parameters	**Unit**	**RG 59 F**	**RG 6 F**	**RG 11 F**
Inner Conductor Max. Resi. at 20°C	Ω/100 m	3.55	2.13	0.84
Nominal Capacitance	pf/m	53	53	53
Characteristics Impedance	Ω	75	75	75
Nominal Velocity Ratio	%	85	85	85
Attenuation dB/100m (20°C)	**Frequency**	**RG 59 F**	**RG 6 F**	**RG 11 F**
211	MHz	12.47	9.50	6.23
250	MHz	13.45	10.50	6.72
300	MHz	14.60	11.50	7.38
350	MHz	15.75	12.45	7.94
400	MHz	16.73	13.30	8.53
450	MHz	17.72	14.35	9.02
500	MHz	18.70	14.95	9.51
550	MHz	19.52	15.70	9.97
600	MHz	20.34	16.45	10.43
750	MHz	22.87	18.35	11.97
865	MHz	24.67	19.95	13.05
1000	MHz	26.64	21.45	14.27

- Figures may vary under different using conditions (±5% variation).
- Normal delivery length : 100 m and 305 m

NOTE : We can also supply these cables with armouring.

LAN CABLE - UTP CAT.6

A growing network system deserves a cable that you can count on for optimum performance now, and into the future.

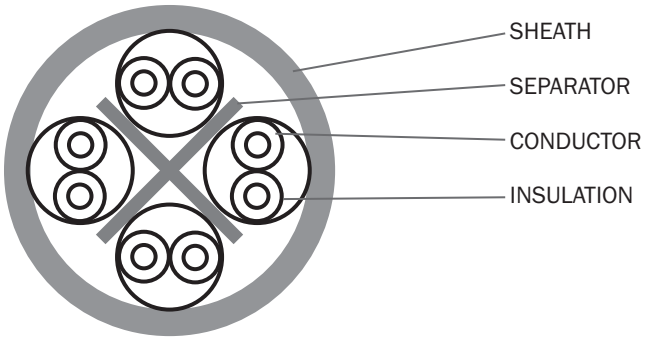
EVEREST ® LAN cables - UTP CAT.6 meet the performance requirements of EIA/TIA 568A/B and are most suitable for voice, data, video, low voltage control and all LAN topologies including horizontal and vertical distribution plenum and riser.

Salient Features

(I) Low attenuation and crosstalk.
(ii) Low structural return loss.

Construction

1. Bare Copper Conductor
2. Filler
3. PP Insulation
4. PVC Sheath
   Colour : Grey



TECHNICAL DATA - PHYSICAL

Conductor	Solid Bare Copper
Nom Dia of Cond.	0.574 mm
Insulation	Special grade PP (ϕ0.97mm)
Colour Code	
Pair - 1	White - Blue
Pair - 2	White - Orange
Pair - 3	White - Green
Pair - 4	White - Brown
Outer Jacket	PVC
Nom Overall Dia	6.3 mm
Jacket Colour	Grey/Off-White
Packaging	Reflex Box 1000 ft (305 m)

TECHNICAL DATA - ELECTRICAL (at 100MHz)

DC Resistance at 20°C (Max)	6.93 ohms/100 m
Capacitance Unbalance Pair to Ground (Max)	330 pF/100 m
Mutual Capacitance (Max)	4.9 nF/100 m
Characteristic Impedance	100 ohms ± 15% at 100 MHz
Nominal Velocity of Propagation	71%
Delay Skew (Max)	15 nS/100 m
Return Loss	18.2 dB
Propagation Delay	538 nS/100 m

TYPICAL CABLE PERFORMANCE

Freq. (MHz)	Attenuation (dB)	PS NEXT (dB)	PSACR (dB)	PSELFEXT (dB)
16	7.5	60	52.5	42
31.25	10.8	54	43	38
62.5	15.3	51	36	35
100	19.5	49	30	31
200	29.5	45	15	25
250	33.2	39.1	5.8	17

LAN CABLE - UTP CAT.5e

A growing network system deserves a cable that you can count on for optimum performance now, and into the future.

EVEREST ® LAN cables - UTP CAT.5e meet the performance requirements of EIA/TIA 568A/B and is most suitable for voice, data, video, low voltage control and for all LAN topologies including horizontal and vertical distribution plenum and riser.

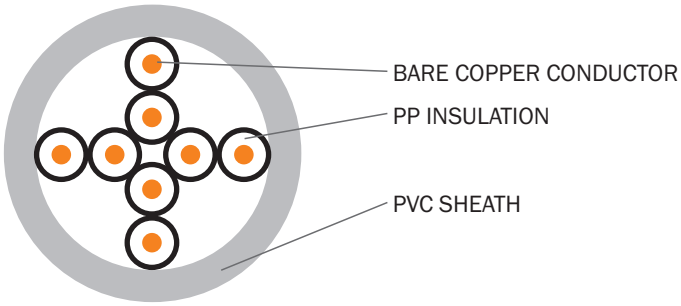
Salient Features

1. Low attenuation and crosstalk
2. Low structural return loss.

The conductor is made up of high conductivity electrolytic grade plain annealed solid copper of size 0.5 mm, High quality polyethylene insulated with suitable colour coding, twisted pair, unshielded, light gray/off-white jacketed with improved fire characteristic meeting requirement of IEC-332 -- High oxygen and temperature index.

Construction

1. PVC jacket
2. PP insulation
3. Bare copper conductor



TECHNICAL DATA - PHYSICAL

Conductor	Solid Bare Copper
Nom Dia of Cond.	0.5 mm
Insulation	Special grade PP
Colour Code	
Pair - 1	White - Blue
Pair - 2	White - Orange
Pair - 3	White - Green
Pair - 4	White - Brown
Outer Jacket	PVC
Nom Overall Dia	5.4 mm
Jacket Colour	Grey/Off-White
Packaging	Reflex Box 1000 ft (305 m)

TECHNICAL DATA - ELECTRICAL

Frequency MHz	Attenuation dB 100 M (Max.)	Next Worst Pair dB(Min.) CAT - 5e	Structural Return Loss(SRL) dB Min
0.772	1.8	64	N.A.
1.00	2.0	62.3	23
4.00	4.1	53.3	23
8.00	5.8	48.8	23
10.00	6.5	47.3	23
16.00	8.2	44.3	23
20.00	9.3	42.8	23
25.00	10.4	41.3	22
31.25	11.7	39.9	21
62.50	17.0	35.4	18
100.00	22.0	32.3	16

PARAMETRIC CHARACTERISTICS

DC Resistance @ 20°C (Max)	9.38Ω / 100 m
Capacitance Unbalance Pair to Ground (Max)	330 pF/100 m
Mutual Capacitance (Max)	5.60 nF / 100 m
Characteristics Impedance	100 ± 15Ω
Nominal Velocity of Propagation	66%
Delay Skew (Max)	45 ns
Propagation Delay @ 200C, 100 MHz	538 ns / 100 m

EVEREST® DATA COMMUNICATION TROUBLE-SHOOTING MATRIX

The table below will help you solve the most common data communication problems efficiently and quickly.

Area	Problem	Possible Causes	Solution
Wire Map	Split Pair	The mater of two pairs have been swapped	Identify and re-terminate
	Transposed Pairs	Two pairs have been swapped when terminating	Identify and re-terminate
	Reversed Pairs	The mate and primary have been terminated around the wrong way	Identify and re-terminate
	Continuity	Cable not terminated	Identify and re-terminate
	Continuity	Cable broken	Re-run cable (cable break location can be determined by TDR function of tester
Length	Failed length	Installed cable over 90 metres	Re-route cable
	Failed length	NVP not set correctly	Set NVP correctly and retest
	Failed length	Excessive temperatures	re-route cabling away from heat source
Attenuation	Failure	Insertion loss - Poor connection	Re-terminate cable and retest
	Failure	Reflection - Impedance mismatch - Cable and connectors not matched	Replace connector and retest
	Failure	Excessive length	Re-route cable; if possible re-terminate
	Failure	Construction of the cable and its components	Replace cable
NEXT ELFEXT PSNET PSELFEXT	Excessive cross talk	Split pairs	Check wire map - Identify and re-terminate
	Excessive cross talk	Poor termination	Re-terminate and retest
	Excessive cross talk	Excessive untwisted pairs at termination	Re-terminate and retest
	Excessive cross talk	Cable ties too tight	Remove cable ties and retest - replace cables
	Excessive cross talk	Cable bundles too large	Re-bundle and retest - replace cables
	Excessive cross talk	Cable pulling tension exceeded at install	Replace cables
	Excessive cross talk	Patch cable not same wiring sequence as cable under test	Replace patch cords
	Excessive cross talk	Old or coiled patch cords	Replace patch cords and/or uncoil patch cords
	Excessive cross talk	Bend radius of cable exceeded	Re-route cables and retest - replace cables
ACR-PSACR	Failure	Performance level of equipment	Check stated performance level of cables and connectors
	Failure	Test patch cable faulty	Replace
Propagation Delay - Delay Skew	Failure	Seriously damaged cable	Replace cable
	Failure	Poorly manufactured cable	Contact supplier - replace cable
Return Loss	Failure	Excessive untwisted pairs at termination	Re-terminate and retest
	Failure	Cable ties too tight	Remove cable ties and retest - replace cables
	Failure	Cable pulling tension exceeded at install	Replace cables
	Failure	Mismatch in cabling components (particularly category 6) or test equipment	Change components and check tester adaptors (personality modules)
	Failure	Bend radius of cable exceeded (often at termination)	Re-route cables and retest - replace cables
General	Various unrepeatable failures	Low battery	Replace battery or recharge unit
	Various unrepeatable failures	Test instrument out of calibration	Re-calibrate
	Various unrepeatable failures	Worn patch leads	Replace leads

INSTRUMENTATION AND DATA CABLES

The growing sophistication of the electronic industry continues to create a need for specially designed cables for use with computer-controlled electrical and electronic equipments. To satisfy requirements for impedance matching, lower bit error rates, lower cross¬talk, longer transmission distances and high signal purity, we are manufacturing an expanding spectrum of instrumentation, data and control cables in full range of sizes, insulations of different types, shields types for special installations. We can also armour these cables for mechanical protection.

DESCRIPTION

Conductor: Solid/stranded, tinned/bare/silver plated and made up of annealed high conductivity EC Grade copper as per IS: 8130 with conductor sizes ranging from 0.05Sq mmto10Sq mm

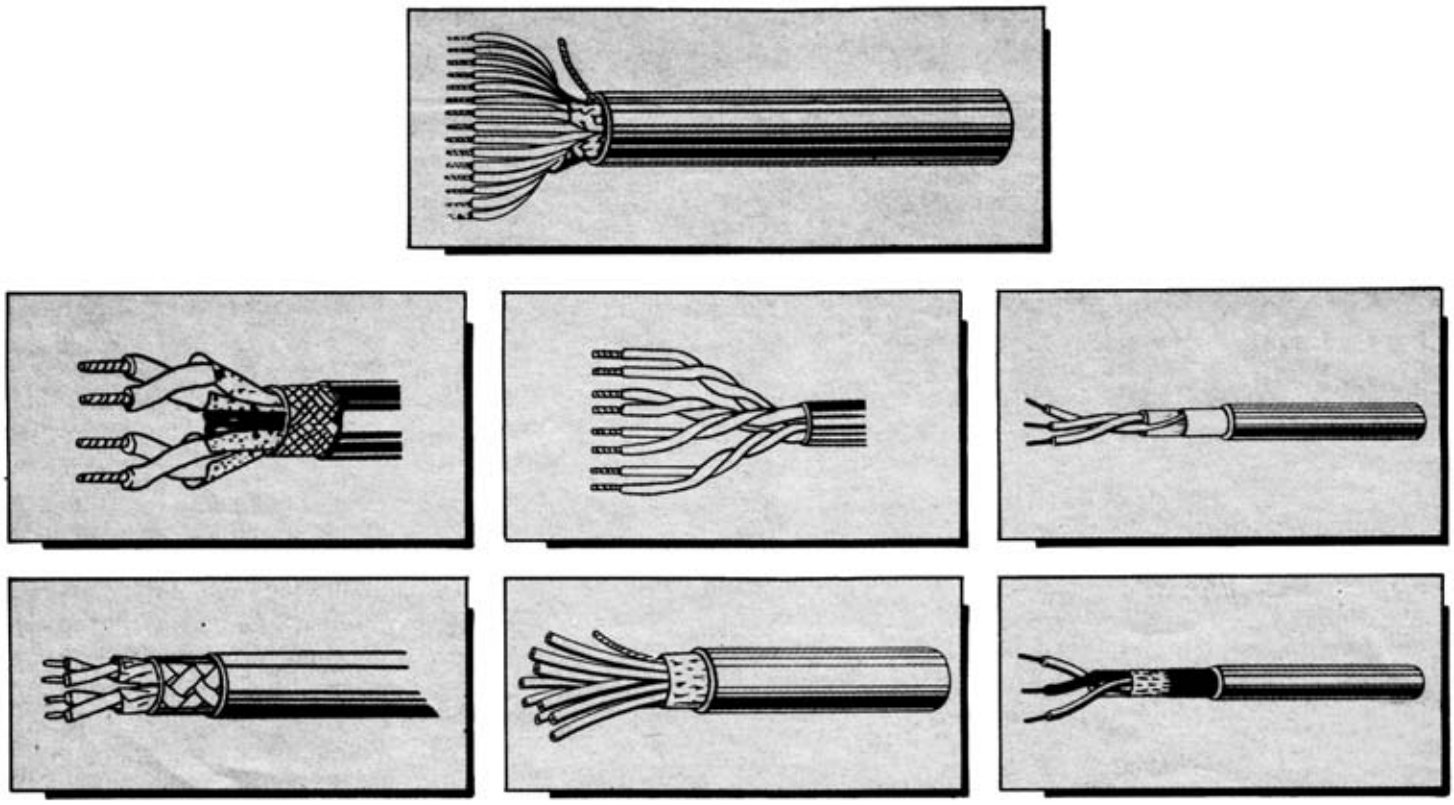
Insulation: PE/Foam PE/P.P./PVC/Special Thermoplastic materials.

Construction: Paired/Triads or Quad construction with individual/collective shields.

Colour Scheme: As per IEC/ITD/MIL standards/As per customer Specification.

Shield: Aluminium foil with ATC drain wire/Copper Braid Shielding.

Sheath: PVC-FRLS/HR/Normal, PU or any other thermoplastic Materials.



TWISTED PAIR DATA TRANSMISSION CABLE

The electronics and automation sectors demand reliable transmission signals without any disruption. The increasing 'electromagnetic pollution of the environment' caused by an increased use of electronics has made it essential to achieve efficient transmission of important signals. Pair stranding is an effective way to oppose cross talk effects.

EVEREST® cables provide a high level of protection and ensure data transmission without the disruptive effects of high frequency interference with close ATC braiding as screening. For further clarification on any variations from the standard product range, for instance, core, outer sheath and expanded temperature range, etc., please do contact us.

Description

Fine wire strands of annealed, plain, high conductivity, electrolytic grade copper conductor. Individual core insulated with extruded PVC compound. Two cores twisted together to form a pair wrapped with Mylar tape, then inner sheath, screened with ATC braiding and finally jacketed with a special PVC compound.

TECHNICAL DATA

For Copper Cable Type:		**YY / YWY / YFY**
Conductor stranding	:	Stranded extra fine wire
Bending Radius (Min.)	:	20 x Cable Diameter
Inductance	:	0.67 mH / km (approx.)
Impedance	:	80 ohm (approx.)
Mutual Capacitance	:	Core - Core 100 nf / km and Core - Screen 140 nf / km
Colour Code	:	As per ISI
Working Voltage	:	350/500 volts
Test Voltage	:	2000 volts
Insulation Resistance	:	20 M ohm/km (At 20°C)

CHARACTERISTICS

Sl. No.	Core Nos. & Cross Sectional area	Outer diameter	Sl. No.	Core Nos. & Cross Sectional area	Outer diameter
	sq mm	mm		sq mm	mm
1.	2 X 2 X 0.14	5.7	23.	2 X 2 X 0.5	8.2
2.	3 X2 X 0.14	6.1	24	3 X 2 X 0.5	9.1
3.	4 X 2 X 0.14	6.5	25	4 X 2 X 0.5	10.3
4.	6 X2 X 0.14	7.8	26	6 X 2 X 0.5	12.3
5.	8 X 2 X 0.14	8.4	27	8 X 2 X 0.5	13.3
6.	10 X 2 X 0.14	9.1	28	12 X 2 X 0.5	15.3
7.	12 X 2 X 0.14	10.1	29	16 X 2 X 0.5	18.1
8.	16 X 2 X 0.14	10.7	30.	2 X 2 X 0.75	8.8
9.	20 X 2 X 0.14	11.2	31.	3 X2 X 0.75	9.7
10.	25 X 2 X 0.14	13.4	32.	4 X 2 X 0.75	11.0
11.	30 X 2 X 0.14	14.2	33.	5 X2 X 0.75	12.8
12.	32 X 2 X 0.14	14.8	34.	6 X 2 X 0.75	13.3
13.	36 X 2 X 0.25	15.5	35.	8 X 2 X 0.75	14.9
14.	2 X 2 X 0.25	6.5	36.	12 X 2 X 0.75	17.9
15.	3 X 2 X 0.25	7.1	37.	16 X 2 X 0.75	20.1
16.	4 X 2 X 0.25	7.9	38.	2 X 2 X 1.0	10.7
17.	6 X 2 X 0.25	9.0	39.	3 X 2 X 1.0	11.7
18.	8 X 2 X 0.25	9.6	40.	4 X 2 X 1.0	13.7
19.	10 X 2 X 0.25	10.1	41.	5 X 2 X 1.0	14.7
20.	12 X 2 X 0.25	12.4	42.	6 X 2 X 1.0	16.3
21.	16 X 2 X 0.25	13.4	43.	8 X 2 X 1.0	17.6
22.	25 X 2 X 0.25	16.9	44.	12 X 2 X 1.0	20.5

FIRE ALARM CABLE

Fire alarm cables are fixed transmission cables and are installed on or beneath plaster surfaces in dry and damp premises as well as in the open air. The cable is supplied with the message "Fire Warning Cable" printed on it and is specially suited for installation in modern fire alarm systems.

Description

EVEREST® Solid/Stranded, annealed, plain electrolytic grade copper conductor conforming to IS: 8130/1984. Core insulated with extruded PVC Type A compound conforming to IS: 5831 (1984). Two such cores twisted together to form a pair wrapped with aluminum backed Mylar tape and drain wire of tinned copper. Finally sheathed with special PVC compound.

TECHNICAL DATA

For Copper Cable Type:		**YY / YWY / YFY**
Conductor stranding	:	Solid/stranded
Bending Radius (Min.)	:	10 x Cable Diameter
Colour Code	:	As per ISI
Working Voltage	:	350/500 volts
Test Voltage	:	2000 volts
Insulation Resistance	:	20 M Ω/km (At 20°C)

CHARACTERISTICS

Pair Nos & Diameter	Outer Diameter	Pair Nos & Diameter	Outer Diameter
mm	mm	mm	mm
1 x 2 x 0.8	5.7	1 x 2 x 0.8	5.0
2 x 2 x 0.8	6.1	2 x 2 x 0.8	5.5
4 x 2 x 0.8	6.5	4 x 2 x 0.8	6.8
6 x 2 x 0.8	7.5	6 x 2 x 0.8	7.8
10 x 2 x 0.8	8.4	10 x 2 x 0.8	9.0
20 x 2 x 0.8	9.1	20 x 2 x 0.8	11.0

EQUIPMENT WIRES

EVEREST® hookup wires and lead wires are manufactured using best quality raw materials, sizes and designs to meet rigid industry and government specifications.

These wires are used extensively for electrical and electronic equipment, where applications range from interconnection circuits to the internal wiring of computers and data processing equipment, etc.

TECHNICAL DATA

Conductor	:	Bare copper / tinned copper / pre-twisted and tinned copper complying with BS : 6360	
Insulation	:	PVC compound complying with BS : 6746	
Operating Temp	:	Heat resistant	-20°C to +85°C
		Low temperature	-40°C to +70°C
		Normal wires	-15°C to +70°C

Size	Nominal Area	Insulation Thickness	Max. Overall Diameter	Max. Cont. Current Rating	Voltage Rating	
mm	mm^2	mm	mm	amps	D.C.	A.C.
1/.4	0.125	0.15	0.8	0.80	750	500
1/.5	0.19	0.15	0.9	1.20	750	500
1/.6	0.28	0.3	1.3	1.74	1500	1000
1/.7	0.38	0.4	1.6	2.43	1500	1000
1/.8	0.50	0.4	1.7	3.11	1500	1000
1/1.0	0.79	0.4	1.8	4.91	1500	1000
7/.10	0.054	0.15	0.7	0.34	750	500
7/.12	0.08	0.15	0.75	0.51	750	500
7/.173	0.16	0.35	1.30	1.05	1500	1000
7/.193	0.20	0.30	1.30	1.28	1500	1000
7/.2	0.22	0.30	1.30	1.36	1500	1000
14/.173	0.33	0.40	1.65	2.10	1500	1000
14/.193	0.41	0.40	1.75	2.62	1500	1000
14/.2	0.44	0.40	1.80	2.81	1500	1000
16/.2	0.50	0.40	1.80	3.11	1500	1000
19/.10	0.15	0.25	1.1	1.00	750	500
24/.2	0.75	0.40	2.20	4.66	1500	1000
32/.2	1.00	0.40	2.3	6.20	1500	1000
48/.2	1.5	0.50	2.8	9.33	1500	1000
63/.2	2.0	0.50	3.0	12.44	1500	1000
80/.2	2.5	0.60	3.5	15.55	1500	1000
128/.2	4.0	0.60	4.0	24.88	1500	1000

UL STYLE NO. 1015

UL Rating : 80°C, 90°C, 105°C, 600V A.C., 750V D.C.
UL Standard : UL:758
Application : Internal wiring of appliances and electronic equipment

Marking : E311108 C US AWM STYLE 1015 AWG 600V 80°C, 90°C,105°C VW-1
AWM IA FT2 FT1 LF

Conductor				Insulation		Max. Conductor resistance at 20°C		Dielectric strength (A.C.)	Unit length
Type	Size	Construction	Diameter	Nominal thickness	Overall diameter	Ω/km			
	AWG	No./mm	mm	mm	mm	bare	tin coated	V/1 Min	metres
Stranded electrolyte copper	30	7/0.100	0.305	0.82	1.94	354	381	3000	305
	29	9/0.100	0.345	0.82	1.98	277	297	3000	305
	28	6/0.130	0.366	0.82	2.00	223	239	3000	305
	27	9/0.120	0.414	0.82	2.05	175	188	3000	305
	26	10/0.128	0.465	0.82	2.10	140	150	3000	305
	25	10/0.147	0.535	0.82	2.17	111	199	3000	305
	24	8/0.180	0.585	0.82	2.22	87.6	94.2	3000	305
	23	10/0.180	0.655	0.82	2.29	69.2	74.5	3000	305
	22	13/0.180	0.745	0.82	2.38	55.4	59.4	3000	305
	21	15/0.188	0.837	0.82	2.48	43.6	46.9	3000	305
	20	17/0.196	0.929	0.82	2.56	34.6	36.7	3000	305
	19	13/0.254	1.055	0.82	2.69	27.4	29.1	3000	305
	18	16/0.254	1.168	0.82	2.80	21.8	23.2	3000	305
	17	21/0.250	1.317	0.82	2.95	17.3	18.3	3000	305
	16	26/0.254	1.489	0.82	3.13	13.7	14.6	3000	305
	15	33/0.254	1.677	0.82	3.30	10.9	11.3	3000	305
	14	41/0.254	1.87	0.82	3.50	8.62	8.96	3000	305
	13	52/0.254	2.1	0.82	3.75	6.82	7.1	3000	305
	12	65/0.254	2.35	0.82	4.00	5.43	5.64	3000	305
	11	60/0.296	2.636	0.82	4.30	4.3	4.48	3000	305
	10	42/0.396	2.95	0.82	4.60	3.409	3.546	3000	305
	9	54/0.396	3.35	1.2	5.75	2.705	2.813	3000	305
	8	67/0.396	3.73	1.2	6.12	2.144	2.23	3000	305
	7	85/0.396	4.19	1.58	7.40	1.7	1.768	3000	305
	6	110/0.390	4.82	1.58	7.98	1.348	1.403	3000	305
	5	140/0.390	5.44	1.58	8.60	1.07	1.113	3000	305
	4	176/.390	6.1	1.58	9.25	0.8481	0.882	3000	305
	3	220/0.390	6.82	1.58	9.98	0.6727	0.6996	3000	305
	2	278/0.390	7.65	1.58	10.80	0.5335	0.5548	3000	305

Remarks :
1) Flame retardent UL VW-1, FT2, FT1.
2) Conductor : Bare/Tin coated electrolytic copper confirming to ASTM B-286.
3) Thermally suitable.
4) Marking as applicable.

UL STYLE NO. 1007

UL Rating : 80°C, 300V
UL Standard : UL:758
Application : Internal wiring of appliances and electronic equipment

Marking : E311108 c UL us AWM STYLE 1007 AWG 300V 80°C VW-1
AWM IA FT2 FT1 LF

Type	Conductor			Insulation		Max. Conductor resistance at 20°C Ω/km		Dielectric strength (A.C.)	Unit length
	Size	Construction	Diameter	Nominal thickness	Overall diameter				
	AWG	No./mm	mm	mm	mm	bare	tin coated	V/1 Min	metres
Stranded electrolyte copper	30	7/0.100	0.305	0.35	1.00	354	381	1500	305
	29	9/0.100	0.345	0.35	1.04	277	297	1500	305
	28	6/0.130	0.366	0.35	1.07	223	239	1500	305
	27	9/0.120	0.414	0.35	1.12	175	188	1500	305
	26	10/0.128	0.465	0.35	1.15	140	150	1500	305
	25	10/0.147	0.535	0.35	1.23	111	199	1500	305
	24	8/0.180	0.585	0.35	1.30	87.6	94.2	1500	305
	23	10/0.180	0.655	0.35	1.35	69.2	74.5	1500	305
	22	13/0.180	0.745	0.35	1.44	55.4	59.4	1500	305
	21	15/0.188	0.837	0.35	1.53	43.6	46.9	1500	305
	20	17/0.196	0.929	0.35	1.63	34.6	36.7	1500	305
	19	13/0.254	1.055	0.43	1.91	27.4	29.1	1500	305
	18	16/0.254	1.168	0.43	2.03	21.8	23.2	1500	305
	17	21/0.250	1.317	0.43	2.18	17.3	18.3	1500	305
	16	26/0.254	1.489	0.43	2.35	13.7	14.6	1500	305

Remarks :
1) Flame retardent UL VW-1, FT2, FT1.
2) Conductor : Bare/Tin coated electrolytic copper confirming to ASTM B-286.
3) Thermally suitable.
4) Marking as applicable.

UL STYLE NO. 1569

UL Rating : 80°C, 90°C, 105°C, 300V
UL Standard : UL 758
Application : Internal wiring of appliances and electronic equipment

Marking : E311108 c UL us AWM STYLE 1569 AWG 300V 80°C, 90°C, 105°C VW-1
AWM IA FT2 FT1 LF

Conductor				Insulation		Max. Conductor resistance at 20°C		Dielectric strength (A.C.)	Unit length
Type	Size	Construction	Diameter	Nominal thickness	Overall diameter	Ω/km			
	AWG	No./mm	mm	mm	mm	bare	tin coated	V/1 Min	metres
Stranded electrolyte copper	30	7/0.100	0.305	0.35	1.00	354	381	1500	305
	29	9/0.100	0.345	0.35	1.04	277	297	1500	305
	28	6/0.130	0.366	0.35	1.07	223	239	1500	305
	27	9/0.120	0.414	0.35	1.12	175	188	1500	305
	26	10/0.128	0.465	0.35	1.15	140	150	1500	305
	25	10/0.147	0.535	0.35	1.23	111	199	1500	305
	24	8/0.180	0.585	0.35	1.30	87.6	94.2	1500	305
	23	10/0.180	0.655	0.35	1.35	69.2	74.5	1500	305
	22	13/0.180	0.745	0.35	1.44	55.4	59.4	1500	305
	21	15/0.188	0.837	0.35	1.53	43.6	46.9	1500	305
	20	17/0.196	0.929	0.35	1.63	34.6	36.7	1500	305
	19	13/0.254	1.055	0.43	1.91	27.4	29.1	1500	305
	18	16/0.254	1.168	0.43	2.03	21.8	23.2	1500	305
	17	21/0.250	1.317	0.43	2.18	17.3	18.3	1500	305
	16	26/0.254	1.489	0.43	2.35	13.7	14.6	1500	305
	15	33/0.254	1.677	0.43	2.53	10.9	11.3	1500	305
	14	41/0.254	1.87	0.56	3.00	8.62	8.96	1500	305
	13	52/0.254	2.1	0.56	3.23	6.82	7.1	1500	305
	12	65/0.254	2.35	0.56	3.47	5.43	5.64	1500	305
	11	60/0.296	2.636	0.82	4.28	4.3	4.48	1500	305
	10	42/0.396	2.95	0.82	4.6	3.409	3.546	1500	305
	9	54/0.396	3.35	0.82	5.00	2.705	2.813	1500	305
	8	67/0.396	3.73	0.82	5.36	2.144	2.23	1500	305
	7	85/0.396	4.19	1.2	6.60	1.7	1.768	1500	305
	6	110/0.390	4.82	1.2	7.20	1.348	1.403	1500	305
	5	140/0.390	5.44	1.2	7.85	1.07	1.113	1500	305
	4	176/0.390	6.1	1.2	8.50	0.8481	0.882	1500	305
	3	220/0.390	6.82	1.2	9.20	0.6727	0.6996	1500	305
	2	278/0.390	7.65	1.2	10.00	0.5335	0.5548	1500	305

Remarks :
1) Flame retardent UL VW-1, FT2, FT1.
2) Conductor : Bare/Tin coated electrolytic copper confirming to ASTM B-286.
3) Thermally suitable.
4) Marking as applicable.

UL STYLE NO. 1007

UL Rating : 80°C, 300V
UL Standard : UL 758
Application : Internal wiring of appliances and electronic equipment

Marking : E311108 C US AWM STYLE 1007 AWG 300V 80°C VW-1
AWM IA FT2 FT1 LF

Conductor			Insulation		Max. Conductor resistance at 20°C		Dielectric strength (A.C.)	Unit length
Type	Size	Conductor diameter	Nominal thickness	Overall diameter	Ω/km			
	AWG	mm	mm	mm	bare	tin coated	V/1 Min	metres
Solid electrolyte copper	30	0.254	0.35	0.954	347	361	1500	305
	29	0.287	0.35	0.987	271	282	1500	305
	28	0.320	0.35	1.020	218	227	1500	305
	27	0.361	0.35	1.061	172	179	1500	305
	26	0.404	0.35	1.104	138	143	1500	305
	25	0.455	0.35	1.155	108	112	1500	305
	24	0.511	0.35	1.211	85.9	89.3	1500	305
	23	0.574	0.35	1.274	67.9	70.6	1500	305
	22	0.643	0.35	1.343	54.3	56.4	1500	305
	21	0.724	0.35	1.424	42.7	44.4	1500	305
	20	0.813	0.35	1.513	33.9	35.2	1500	305
	19	0.912	0.43	1.772	26.9	28.0	1500	305
	18	1.020	0.43	1.880	21.4	22.2	1500	305
	17	1.150	0.43	2.010	16.9	17.6	1500	305
	16	1.290	0.43	2.150	13.4	14.0	1500	305

Remarks :
1) Flame retardent UL VW-1, FT2, FT1.
2) Conductor : Bare/Tin coated electrolytic copper confirming to ASTM B-286.
3) Thermally suitable.
4) Marking as applicable.

UL STYLE NO. 1015

UL Rating : 80° C, 90°C, 105°C, 600V
UL Standard : UL 758
Application : Internal wiring of appliances and electronic equipment

Marking : E311108 C US AWM STYLE 1015 AWG 600V 80° C, 90°C, 105°C VW-1
AWM IA FT2 FT1 LF

Conductor			Insulation		Max. Conductor resistance at 20°C		Dielectric strength (A.C.)	Unit length
Type	Size	Conductor diameter	Nominal thickness	Overall diameter	Ω/km			
	AWG	mm	mm	mm	bare	tin coated	V/1 Min	metres
Solid electrolyte copper	30	0.254	0.82	1.89	347	361	3000	305
	29	0.287	0.82	1.93	271	282	3000	305
	28	0.320	0.82	1.95	218	227	3000	305
	27	0.361	0.82	2.01	172	179	3000	305
	26	0.404	0.82	2.04	138	143	3000	305
	25	0.455	0.82	2.10	108	112	3000	305
	24	0.511	0.82	2.15	85.9	89.3	3000	305
	23	0.574	0.82	2.20	67.9	70.6	3000	305
	22	0643	0.82	2.28	54.3	56.4	3000	305
	21	0.724	0.82	2.36	42.7	44.4	3000	305
	20	0.813	0.82	2.45	33.9	35.2	3000	305
	19	0.912	0.82	2.55	26.9	28.0	3000	305
	18	1.020	0.82	2.66	21.4	22.2	3000	305
	17	1.150	0.82	2.79	16.9	17.6	3000	305
	16	1.290	0.82	2.93	13.4	14.0	3000	305
	15	1.450	0.82	3.09	10.6	11.1	3000	305
	14	1.630	0.82	3.25	8.45	8.78	3000	305
	13	1.830	0.82	3.47	6.69	6.97	3000	305
	12	2.050	0.82	3.68	5.31	5.53	3000	305
	11	2.300	0.82	3.95	4.22	4.39	3000	305
	10	2.588	0.82	4.22	3.343	3.476	3000	305
	9	2.906	1.2	5.30	2.652	2.73	3000	305
	8	3.264	1.2	5.66	2.102	2.163	3000	305
	7	3.665	1.58	6.80	1.667	1.7161	3000	305
	6	4.115	1.58	7.27	1.323	1.361	3000	305
	5	4.620	1.58	7.77	1.049	1.079	3000	305
	4	5.189	1.58	8.35	0.8315	0.8559	3000	305
	3	5.827	1.58	8.98	0.6595	0.6788	3000	305
	2	6.543	1.58	9.69	0.5231	0.5384	3000	305

Remarks :
1) Flame retardent UL VW-1, FT2, FT1.
2) Conductor : Bare/Tin coated electrolytic copper confirming to ASTM B-286.
3) Thermally suitable.
4) Marking as applicable.

UL STYLE NO. 1569

UL Rating : 80° C, 90°C, 105°C, 300V
UL Standard : UL 758
Application : Internal wiring of appliances and electronic equipment

Marking : E311108 C US AWM STYLE 1569 AWG 300V 80° C, 90°C, 105°C VW-1
AWM IA FT2 FT1 LF

Conductor			Insulation		Max. Conductor resistance at 20°C		Dielectric strength (A.C.)	Unit length
Type	Size	Conductor diameter	Nominal thickness	Overall diameter	Ω/km			
	AWG	mm	mm	mm	bare	tin coated	V/1 Min	metres
Solid electrolyte copper	30	0.254	0.35	0.954	347	361.0	1500	305
	29	0.287	0.35	0.987	271	282.0	1500	305
	28	0.320	0.35	1.020	218	227.0	1500	305
	27	0.361	0.35	1.061	172	179.0	1500	305
	26	0.404	0.35	1.104	138	143.0	1500	305
	25	0.455	0.35	1.155	108	112.0	1500	305
	24	0.511	0.35	1.211	85.9	89.3	1500	305
	23	0.574	0.35	1.274	67.9	70.6	1500	305
	22	0.643	0.35	1.343	54.3	56.4	1500	305
	21	0.724	0.35	1.424	42.7	44.4	1500	305
	20	0.813	0.35	1.513	33.9	35.2	1500	305
	19	0.912	0.43	1.772	26.9	28.0	1500	305
	18	1.020	0.43	1.880	21.4	22.2	1500	305
	17	1.150	0.43	2.010	16.9	17.6	1500	305
	16	1.290	0.43	2.150	13.4	14.0	1500	305
	15	1.450	0.43	2.310	10.6	11.1	1500	305
	14	1.630	0.56	2.750	8.45	8.78	1500	305
	13	1.830	0.56	2.950	6.69	6.97	1500	305
	12	2.050	0.56	3.170	5.31	5.53	1500	305
	11	2.300	0.82	3.940	4.22	4.39	1500	305
	10	2.588	0.82	4.228	3.343	3.476	1500	305
	9	2.906	0.82	4.550	2.652	2.73	1500	305
	8	3.264	0.82	4.900	2.102	2.163	1500	305
	7	3.665	1.2	6.060	1.667	1.7161	1500	305
	6	4.115	1.2	6.500	1.323	1.361	1500	305
	5	4.620	1.2	7.020	1.049	1.079	1500	305
	4	5.189	1.2	7.580	0.8315	0.8559	1500	305
	3	5.827	1.2	8.220	0.6595	0.6788	1500	305
	2	6.543	1.2	8.940	0.5231	0.5384	1500	305

Remarks :
1) Flame retardent UL VW-1, FT2, FT1.
2) Conductor : Bare/Tin coated electrolytic copper confirming to ASTM B-286.
3) Thermally suitable.
4) Marking as applicable.

SJT FLEXIBLE CORDS

UL Rating : 60°C, 75°C, 90°C, 105°C, 300V
UL Standard : UL:62 - Flexible Service Cords
No. of Conductor : 2

Marking : EVEREST® E311111 (UL) SJT AWG X 2C 300V 60°C, 75°C, 90°C, 105°C FT2

Conductor			Nominal thickness		Max. Conductor resistance at 20°C		Dielectric strength	Unit length
Size	Construction	Diameter of Sheath	Insulation	Sheath	Ω/km		(A.C.)	
AWG	No./mm	mm	mm	mm	bare	tin coated	V/1 Min	Ft.
18	16/0.254	5.65	0.43	0.82	21.8	23.2	1500	500
17	21/0.250	5.95	0.43	0.82	17.3	18.3	1500	500
16	26/0.254	6.30	0.43	0.82	13.7	14.6	1500	500
14	41/0.254	8.40	0.56	1.20	8.62	8.96	1500	500
12	65/0.254	9.30	0.56	1.20	5.43	5.64	1500	500
10	42/0.396	11.55	0.82	1.20	3.409	3.546	1500	500

UL Rating : 60°C, 75°C, 90°C, 105°C, 300V
UL Standard : UL:62 - Flexible Service Cords
No. of Conductor : 3

Marking : EVEREST® E311111 (UL) SJT AWG X 3C 300 V 60°C, 75°C, 90°C, 105°C FT2

Conductor			Nominal thickness		Max. Conductor resistance at 20°C		Dielectric strength	Unit length
Size	Construction	Diameter of Sheath	Insulation	Sheath	Ω/km		(A.C.)	
AWG	No./mm	mm	mm	mm	bare	tin coated	V/1 Min	Ft.
18	16/0.254	6.04	0.43	0.82	21.8	23.2	1500	500
17	21/0.250	6.37	0.43	0.82	17.3	18.3	1500	500
16	26/0.254	6.75	0.43	0.82	13.7	14.6	1500	500
14	41/0.254	8.95	0.56	1.20	8.62	8.96	1500	500
12	65/0.254	9.95	0.56	1.20	5.43	5.64	1500	500
10	42/0.396	12.50	0.82	1.20	3.409	3.546	1500	500

Remarks : 1) Flame retardant UL FT2.
2) Conductor: Bare/Tin coated electrolytic copper confirming to ASTM B-286.
3) Thermally suitable.
4) Marking as applicable.

Note : In marking the size and temperature rating shall be as per customer requirement.

SJT FLEXIBLE CORDS

UL Rating : 60°C, 75°C, 90°C, 105°C, 300V
UL Standard : UL:62 - Flexible Service Cords
No. of Conductor : 4

Marking : EVEREST® E311111 (UL) SJT AWG X 4C 300V 60°C, 75°C, 90°C, 105°C FT2

Conductor			Nominal thickness		Max. Conductor resistance at 20°C Ω/km		Dielectric strength (A.C.)	Unit length
Size	Construction	Diameter of Sheath	Insulation	Sheath				
AWG	No./mm	mm	mm	mm	bare	tin coated	V/1 Min	Ft.
18	16/0.254	6.73	0.43	0.82	21.8	23.2	1500	500
17	21/0.250	7.10	0.43	0.82	17.3	18.3	1500	500
16	26/0.254	7.56	0.43	0.82	13.7	14.6	1500	500
14	41/0.254	9.96	0.56	1.20	8.62	8.96	1500	500
12	65/0.254	11.15	0.56	1.20	5.43	5.64	1500	500
10	42/0.396	14 .00	0.82	1.20	3.409	3.546	1500	500

UL Rating : 60°C, 75°C, 90°C, 105°C, 300V
UL Standard : UL:62 - Flexible Service Cords
No. of Conductor : 5

Marking : EVEREST® E311111 (UL) SJT AWG X 5C 300 V 60°C, 75°C, 90°C, 105°C FT2

Conductor			Nominal thickness		Max. Conductor resistance at 20°C Ω/km		Dielectric strength (A.C.)	Unit length
Size	Construction	Diameter of Sheath	Insulation	Sheath				
AWG	No./mm	mm	mm	mm	bare	tin coated	V/1 Min	Ft.
18	16/0.254	7.25	0.43	0.82	21.8	23.2	1500	500
17	21/0.250	7.70	0.43	0.82	17.3	18.3	1500	500
16	26/0.254	8.20	0.43	0.82	13.7	14.6	1500	500
14	41/0.254	10.75	0.56	1.20	8.62	8.96	1500	500
12	65/0.254	12.00	0.56	1.20	5.43	5.64	1500	500
10	42/0.396	15.25	0.82	1.20	3.409	3.546	1500	500

UL Rating : 60°C, 75°C, 90°C, 105°C, 300V
UL Standard : UL:62 - Flexible Service Cords
No. of Conductor : 6

Marking : EVEREST® E311111 (UL) SJT AWG X 6C 300 V 60°C, 75°C, 90°C, 105°C FT2

Conductor			Nominal thickness		Max. Conductor resistance at 20°C Ω/km		Dielectric strength (A.C.)	Unit length
Size	Construction	Diameter of Sheath	Insulation	Sheath				
AWG	No./mm	mm	mm	mm	bare	tin coated	V/1 Min	Ft.
18	16/0.254	7.82	0.43	0.82	21.8	23.2	1500	500
17	21/0.250	8.30	0.43	0.82	17.3	18.3	1500	500
16	26/0.254	8.83	0.43	0.82	13.7	14.6	1500	500
14	41/0.254	11.55	0.56	1.20	8.62	8.96	1500	500
12	65/0.254	13.00	0.56	1.20	5.43	5.64	1500	500
10	42/0.396	16.50	0.82	1.20	3.409	3.546	1500	500

Remarks : 1) Flame retardant UL FT2.
2) Conductor : Bare/Tin coated electrolytic copper confirming to ASTM B-286.
3) Thermally suitable.
4) Marking as applicable.

Note : In marking the size and temperature rating shall be as per customer requirement.

SVT FLEXIBLE CORDS

UL Rating : 60°C, 75°C, 90°C, 105°C, 300V
UL Standard : UL:62 - Flexible Service Cords
No. of Conductor : 2

Marking : EVEREST® E311111 (UL) SVT AWG X 2C 300V 60°C, 75°C, 90°C, 105°C FT2

Conductor			Nominal thickness		Max. Conductor resistance at 20°C Ω/km		Dielectric strength (A.C.)	Unit length
Size	Construction	Diameter of Sheath	Insulation	Sheath				
AWG	No./mm	mm	mm	mm	bare	tin coated	V/1 Min	Ft.
18	41/0.160	5.65	0.43	0.82	21.8	23.2	1500	500
17	51/0.160	5.95	0.43	0.82	17.3	18.3	1500	500
16	66/0.160	6.30	0.43	0.82	13.7	14.6	1500	500

UL Rating : 60°C, 75°C, 90°C, 105°C, 300V
UL Standard : UL:62 - Flexible Service Cords
No. of Conductor : 3

Marking : EVEREST® E311111 (UL) SVT AWG X 3C 300 V 60°C, 75°C, 90°C, 105°C FT2

Conductor			Nominal thickness		Max. Conductor resistance at 20°C Ω/km		Dielectric strength (A.C.)	Unit length
Size	Construction	Diameter of Sheath	Insulation	Sheath				
AWG	No./mm	mm	mm	mm	bare	tin coated	V/1 Min	Ft.
18	41/0.160	6.04	0.43	0.82	21.8	23.2	1500	500
17	51/0.160	6.37	0.43	0.82	17.3	18.3	1500	500
16	66/0.160	6.75	0.43	0.82	13.7	14.6	1500	500

Remarks :
1) Flame retardant UL FT2.
2) Conductor : Bare/Tin coated electrolytic copper confirming to ASTM B-286.
3) Thermally suitable.
4) Marking as applicable.

UNIVERSAL SPARES (INDIA) PRIVATE LIMITED

LEADING MANUFACTURERS OF WIRE HARNESS ASSEMBLIES, CABLE ASSEMBLIES, POWER CORDS, ETC.

The company, besides cables, has also taken a lead in establishing itself as one of the leading manufacturers/suppliers of wire harness assemblies, cable assemblies, power cords, patch cords, etc., to meet the needs of varied industrial sectors. The company's quality products have been widely acclaimed by indigenous and international OEMs.

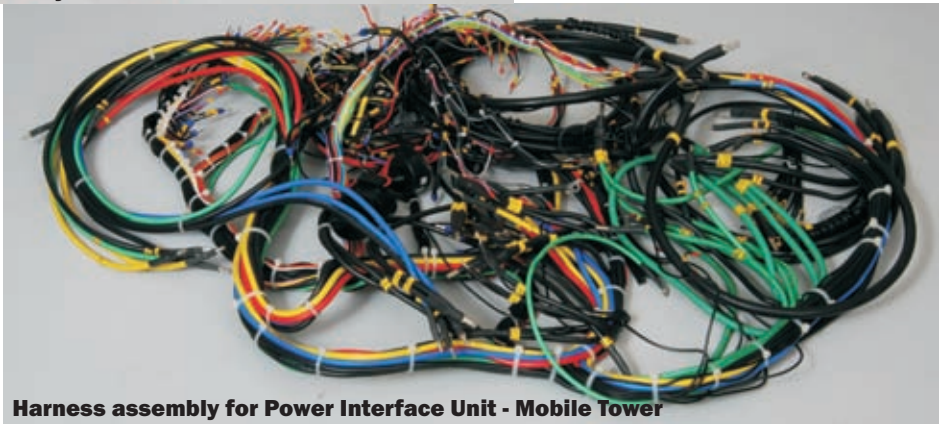
3-pin plugs

Oil-filled submersible pump harness assemblies

UL approved wire harness assemblies

Wire harness assemblies for ACs

Harness assembly for Power Interface Unit - Mobile Tower



Harness assembly for Power Interface Unit - Mobile Tower

UNIVERSAL SPARES (INDIA) PRIVATE LIMITED

EVEREST® Brand

Infrastructure

The Company has a excellent infrastructure spread-overall area of 86370 sq feet with:

- Ultra modern plant with integrated in-house facilities.
- State-of-the-art manufacturing and assembling facilities for wire harness assemblies, cable assemblies, moulded power cords, etc.
- Management by qualified and experienced professionals.

Commitment to Quality

The company is committed to global standards of quality, sourcing best of raw materials and components and stringent in process manufacturing as per relevant specifications. The company actively promotes and encourages group activities like quality circles for continuous improvement in product quality. ISO : 9001-2008 certified, the company has a well-equipped, BIS & UL approved test laboratory that ensures that the company's products conform to relevant specifications. The company has the necessary ISI certification marks and UL/C-UL approvals. The company's product quality, prompt delivery and services have been acclaimed by its clients.

Cost Efficiency

The company sources its raw material from best available sources at competitive prices without compromising on quality. The value engineering of all the products is done on a regular basis to minimise costs and continuously improve quality. Non-value adding activities are identified and eliminated to improve the process efficiencies. This helps the company's commitment to offer quality products at lowest possible prices.

Dependability

The company ensures and motivates individual commitment of the highest order. The latest ERP system ensures an efficient supply chain management leading to on-dot deliveries and total customer satisfaction.

Turnover and Growth

The company, fuelled by its continuous quality and technology upgradation, R & D and customer satisfaction, has grown and posted impressive yearly turnovers.

Exports

The company exports its products to the Middle East, USA and European countries.

Safety Approvals

The company employs lead-free soldering technologies and applies RoHS and REACH compliant practices.

Conductor drawing and online annealing

Extrusion sheathing

PVC compounding

Injection moulding

Power cable extrusion

Harness assembly

Universal Spares (India) Pvt. Ltd.

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