

Safe Connections... ...Secure Connections





CHAIRMAN'S MESSAGE



SH. V.P. GOYAL
Chairman, Rajdoot Cables

First and above all I would like to express my thanks to all of my dealers, distributors and cooperators ... that have been bound to the evolving Rajdoot Cables success story. Without your unflinching support and hard work we could not have achieved this position. The support and hard work of many people have made this possible. I would like to thank each and everyone for their love and support.

Starting my career with a Govt. Job, I had all along believed at the bottom of my heart, that I could do something good in the cable business and therefore in 1979, I decided to get into the business. I started with a shop and named it RAJDOOT CABLES. In the beginning I faced many difficulties...yet, with time people started judging the quality of our wires against others....and the Rajdoot Cables' growth started. It was during the 80s-90s' decades that Rajdoot Cables began to lead in whole of Faridabad and NCR markets and it still continues to lead till date. We even promise to provide the maximum benefit to our customers, exploring new frontiers resulting in nation's vibrant future.

With the passage of time, we have decided to distribute Rajdoot Wires/Cables to major corporate houses, public sectors like Railways, NTPC and also other Govt. departments such as Indian Oil, State Mines etc. and here as well, We have got good and favorable response. Working with a single minded objective of empowering the lives of the people with our environment friendly products backed by time tested technology. With persistent focus on innovation, building up credibility through strategic thinking, operational expertise, well planned investments and business integrity, we aim to continue our journey unabated

Now, we have started working on many other dedicated projects /installations and are hopeful of a good response in these projects as well. It is the unconditional support of all our customers and sales partners that have made our journey so fruitful and fulfilling. Thanking all and we promise to keep no stone unturned to make our journey more exciting and memorable one.

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ABOUT US

RAJDOOT CABLES was established in the year 1979. Today, It is one of the pioneer manufacturers in India in the domain of indigenous electrical wires & cables of varied range both in copper and aluminium conductor.

RAJDOOT CABLES having a manufacturing unit in Ballabhgarh, Faridabad (Haryana) in a covered area of 72000 sq.ft. engaged with a team of highly motivated, educated and well experienced engineer and technical personnel. They work day and night for consistent high quality products and to meet customers every specific need.

RAJDOOT CABLES having a plant fully equipped with all modern machineries and facilities with constant upgradation and expansions which have created confidence and ability for manufacturing various sophisticated wires & cables confirming to National and International Standards. The manufacturing unit has an inbuilt laboratory, capable of carrying every test and have the latest equipments.

Our Cables are manufactured strictly in accordance with Indian & International Standards like I.S., B.S., ASTM, JIS etc. In recognition of the quality of our cables to the consumers, the cables with hallmark of quality ISI covering the entire range of wires & cables manufactured by RAJDOOT CABLES are approved by Indian Railways, Steel Plants, Hindustan Zinc Ltd., Hindustan Copper Ltd., ONGC, NTPC, SAIL, HAL, IOCL, Orient, Delta, L.G. Electronics, Voltas, Blue Star etc.

CUSTOMER'S SATISFACTION

In an ongoing process to enhance the satisfaction of customer, We offers variety of services like:

- Commercially competitive prices.
- Reliable and consistent quality.
- Just in timely delivery.
- Product development for change in market.
- A targeted stocking policy.
- Technical support for applications / projects.



Note: This particular catalogue is for house wires - LT PVC & XLPE insulated power, control cables and covers all the necessary information on wires and cables required by electrical consultants, engineering companies, electrical contractors and even the end users.

PRODUCT RANGE (CROSS SECTIONAL VIEW)



Single Core HRFR

Page No.: 09



CAT 5e Lan Cable

Page No.: 17



Single Core FRLS/ZHLS/HFLS

Page No.: 09



CAT 6 Lan Cable

Page No.: 18



Single Core FR PVC

Page No.: 10



CCTV Camera Cable

Page No.: 19



Multicore Round PVC

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Speaker Cable

Page No.: 20



PVC Submersible Flat Cable

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Instrumentation Cable

Page No.: 21



Coaxial Cable

Page No.: 15

LT PVC - AL/CU 1100 volt
Armoured/ Unarmoured Cable
(IS:1554/part-1)

Page No.: 25-28



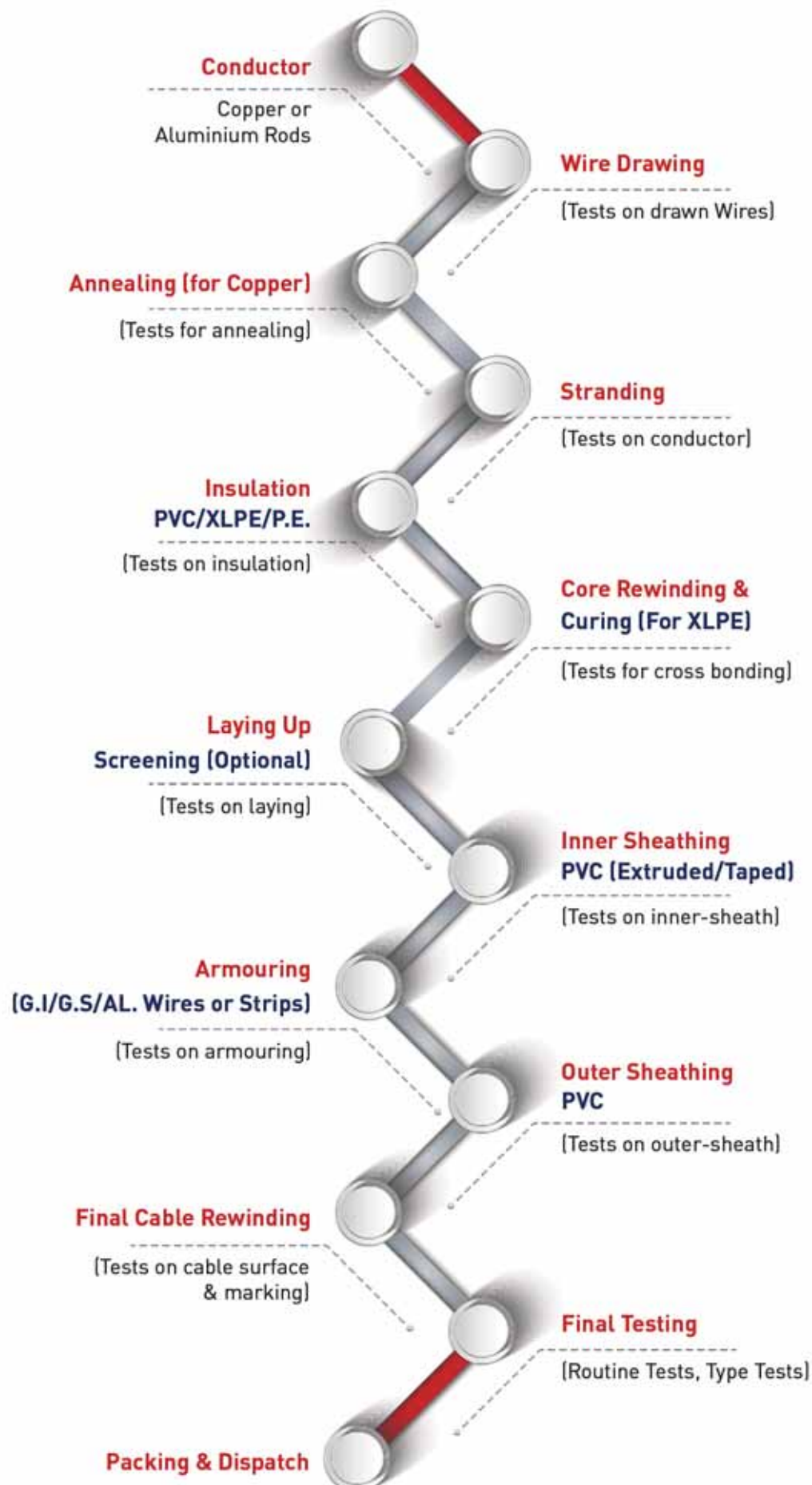
Telephone Cable

Page No.: 16

LT XLPE - AL/CU 1100 volt
Armoured/Unarmoured Cable
(IS:7098/part-1)

Page No.: 32-35

MANUFACTURING FLOW CHART



Remark: All the tests during the process checked and confirmed accordingly documented quality assurance plan.

QUALITY MANAGEMENT

Quality is the first priority in Rajdoot. We ensure quality of our products at each stage of production, right from raw material to finished goods. Before product reaches to customer, it passes a whole bunch of test to confirm that customers get best. Quality Department of Rajdoot uses latest instruments in its lab & takes proper steps to meet expectation of their customers. Quality department at Rajdoot have a modern Lab, well equipped with latest instruments & tools to check the product on a definite parameter.

COMPANY POLICY:

Our company policy is to design & produce products and services that meet or enhance our customer's requirements and comply with all statutory and regulatory requirements. We accomplish this by adhering to our management system and operational methods that recognize customer's satisfaction as a primary goal.

QUALITY POLICY:

Our products are committed for enhancing customer's satisfaction. We shall achieve this by continuous improvement in timely delivery of products and its specifications while ensuring prevention to pollution, ill-health, injury, safety at all levels and abiding all legal & other requirements with close involvement of all employees and business associates.

QUALITY OBJECTIVES:

- Enhancement of Customer's satisfaction upto 100%.
- Timely Delivery of Products.
- Reducing Rejection.
- Reducing Rework.
- Prevention of Pollution.
- Optimizing the consumption of resources.
- Prevention of ill-health.
- Prevention of Injury.
- Training of all personnel.



HOUSE PROTECTION SERIES

RAJDOOT housing wires is a trusted name today for reliable electrical wiring in homes, offices, multistoried buildings, hospitals, hotels, schools, industries etc. and enjoy enviable reputation for its quality. "RAJDOOT" wires are manufactured making use of best quality bright annealed electrolytic grade copper with conductivity of more than 101% for sustainable energy consumption and for smooth flow of electricity. PVC used as an insulant is manufactured in-house and has good di-electric and physical properties with high insulation resistance value that protects against any electrical fault. "RAJDOOT" wires are manufactured with solid, stranded and flexible conductors.

RANGE

Fire Retardant (FR) : Our normal wires are flame retardant. In a fire the oxygen percentage in the vicinity increases because of formation of air -drafts. This makes general purpose PVC cables catch fire. But the FR PVC Insulated Flexible Industrial cables have an oxygen index>30 and offers some protection against propagation of the flame.

Fire Retardant Low Smoke & Halogen (FR-LSH) : Apart from having high oxygen and temperature index, our FR-LSH wires also have low smoke and toxic gas generation properties which helps in easy evacuation and rescue operation in case of fire and are ideal for use in places of high human density.

Halogen Free / Zero Halogen Low Smoke (HFLS/ZHLS) : Based on Poly-olefinic thermoplastic compound, our HFLS/ZHLS 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.

Heat Resistant (85°C) : Beside being fire retardant, our heat resistant (85°C) wires have properties to with-stand the excess heat generated in the wire due to low voltage. These wires can with-stand the conductor temperature upto 85°C and are suited for areas where there are wide voltage fluctuations.

WHY RAJDOOT WIRES & CABLES ARE BETTER

Energy-Efficient Cables : "RAJDOOT" provide some of the highest levels of electrical conductivity i.e. 101% copper conductivity which means reduction in electricity bills -2 to -3%. It also provides additional protection against voltage fluctuations.

Low Voltage Drop : Drop in voltage from point of supply to the end-terminal is called voltage drop. High voltage drop across conductors is undesirable as it reduces the supplied energy. "RAJDOOT" wires and cables have an adequate conductor diameter, uniform lay and smooth finish to ensure low voltage drop and higher efficiency in using electrical equipment.

Current Carrying Capacity : Due to low conductor resistance, current carrying capacity is more.

Short Circuit Protection : Fire caused due to short circuit is the most common electrical mishap. Short circuit can be caused by most of reasons such as faulty wiring, broken insulation due to inferior quality of insulation, circuit overload, and defective plugs, switches, cords, receptacles, etc. "RAJDOOT" wires ensure superior insulation and conductor with perfect center having automatic self-centering head coupled with on-line diameter controller maintains conductor perfectly in the center of PVC insulation which prevents electric breakdown in PVC.

Consistency : 100% wires pass through spark tester to withstand high voltage stresses of 9000 Volts to give consistent quality, free of foreign particles throughout.

Better Flexibility : Uniform annealing of copper provides more flexibility.

Higher Di-Electric Strength : Di-electric strength represents the magnitude of voltage endured by test-piece of wire when a specified voltage is passed through it for a specified duration of time. Higher di-electric strength means better electrical characteristics. "RAJDOOT" has an in-house PVC compound manufacturing unit where PVC is blended to offer high di-electric strength to prevent electric breakdown in PVC.

Double Insulated : Thin coloured layer is only on the surface for colour identification. Thick layer of natural virgin PVC is underneath which gives improved insulation resistance value.

Anti Termite & Anti Rodent : In case of electrical insulation, damages caused by pests may lead to short circuit which can become a cause for a major disaster, loss of property and human life. "RAJDOOT" cables provides insulation with termite and rodent repulsion properties.

PVC INSULATED INDUSTRIAL GRADE CABLES

Single Core HRFR PVC Insulated Industrial Grade Copper Conductor [Unsheathed] Flexible Cables, 1100 Volts as per IS:694/2010.

Nominal Cross Sectional area of conductor	Number/ Nom. Dia of cond. strands*	Thickness of Insulation (Nom)	Approx overall Diameter	Current Carrying Capacity 2 Cables Single Phase		Max. Conductor Resistance per KM at 20°C
				Conduit / Trunking	Unenclosed clipped directly to a surface or on cable trays	
sq. mm.	mm	mm	mm	Amps	Amps	Ohms
0.5	16/0.2	0.6	2.1	4	4	39.00
0.75	24/0.2	0.6	2.3	8	8	26.00
1.0**	14/0.3	0.7	2.7	12	13	18.10
1.5**	22/0.3	0.7	3.0	14	18	12.10
2.5**	36/0.3	0.8	3.6	20	24	7.41
4.0	56/0.3	0.8	4.1	26	32	4.95
6.0	84/0.3	0.8	4.6	34	41	3.30

CONSTRUCTION :-

Conductor : Plain annealed copper conductor as per IS:8130

Insulation : Primary - Natural HR PVC with FR property

Secondary - Skin colour coated HR PVC FR property

Colour: Red/Yellow/Blue/Black/Green

Any other colour on specific request can also be supplied.

Skin colour HR PVC

Natural HR PVC

Multistrand Flexible Copper Conductor

Rajdoot Rajdoot Rajdoot Rajdoot Rajdoot

Single Core FRLSH/ZHLS/HFLS PVC Insulated Industrial Grade Copper Conductor [Unsheathed] Flexible Cables, 1100 Volts as per IS : 694 / 2010.

Nominal Cross Sectional area of conductor	Number/Non. Dia of Cond. strands*	Thickness of Insulation (Nom)	Approx. Overall Diameter	Current Carrying Capacity 2 Cables Single Phase		Max. Conductor Resistance per KM at 20°C
				Conduit/ Trunking	Unenclosed clipped directly to a surface or on cable trays	
sq. mm.	mm	mm	mm	Amps	Amps	Ohms
1.0**	14/0.3	0.7	2.7	11	12	18.10
1.5**	22/0.3	0.7	3.0	13	16	12.10
2.5**	36/0.3	0.8	3.6	18	22	7.41
4.0	56/0.3	0.8	4.1	24	29	4.95
6.0	84/0.3	0.8	4.6	31	37	3.30

CONSTRUCTION :-

Conductor : Plain annealed copper conductor as per IS:8130

Insulation : Colour PVC Compound with FRLSH/HFLS/ZHLS Property

Colour : Red/Yellow/Blue/Black/Green

Any other colour on specific request can also be supplied.

Skin Colour PVC

Natural PVC

Multistrand Flexible Copper Conductor

Rajdoot Rajdoot Rajdoot Rajdoot Rajdoot

Note: Available in 90 metres length in carton packaging & 180 metres project lengths in poly bag packaging.

**Conductor Shall be class-II for 1.0, 1.5 & 2.5 sqmm & for other size shall be of class V as per IS:8130.

*The number and diameter of conductor strands are for reference only. Conductor resistance as per IS:8130 is the governing criteria.

PVC INSULATED INDUSTRIAL GRADE CABLES

Single Core FR PVC Insulated Industrial Grade Copper Conductor (Unsheathed)
Flexible Cables, 1100 Volts as per IS:694/2010.

Normal Cross Sectional area of conductor	Number/ Nom. Dia of cond. Strands *	Thickness of Insulation (Nom)	Approx Overall Diameter	Current Carrying Capacity 2 Cables Single Phase	Max. Conductor Resistance per KM at 20°C
				Unenclosed clipped directly to a surface or on cable trays	
Sq. mm.	mm.	mm.	mm.	Amps	Ohms
10	80/0.4	1.0	6.1	46	1.91
16	126/0.4	1.0	7.0	62	1.21
25	196/0.4	1.2	8.6	80	0.780
35	276/0.4	1.2	9.7	102	0.554
50	396/0.4	1.4	11.5	138	0.386
70	360/0.5	1.4	13.0	214	0.272
95	475/0.5	1.6	15.1	260	0.206
120	608/0.5	1.6	16.6	305	0.161
150	750/0.5	1.8	18.5	355	0.129
185	925/0.5	2.0	20.4	415	0.106
240	1221/0.5	2.2	23.2	500	0.0801
300	1525/0.5	2.4	26.0	585	0.0641
400	2013/0.5	2.6	30.0	695	0.0486
500	2310/0.5	2.8	33.0	737	0.0384
630	3090/0.5	2.8	38.0	825	0.0287

Note : Conductor as per class V of IS : 8130 confirming to IS:694/2010 100 metres in polywrap packing & in bigger packing on request

*The number and diameter of conductor strands are for reference only, Conductor resistance as per IS:8130 is the governing criteria

CONSTRUCTION :-

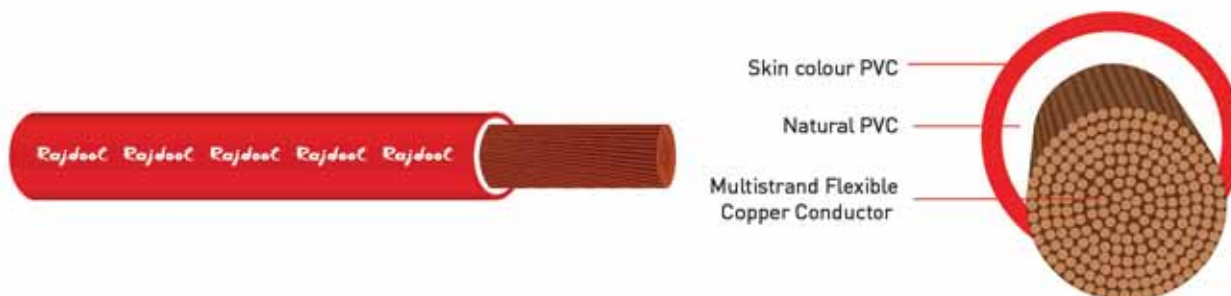
Conductor : Plain annealed copper conductor as per IS:8130

Insulation : Primary - Natural PVC with FR property
Secondary - Skin colour Coated PVC with FR property

Colour : Red/Yellow/Blue/Black/Green

Any other colour on specific request can also be supplied subject to economical run.

Note : Single core PVC insulated Stranded Copper Conductor available on request.



ANNEALED COPPER ETP GRADE
101% CONDUCTIVITY (IACS) USED

MULTICORE ROUND PVC CABLES

"Rajdoot" manufacturing and supplies premium quality multi core flexible cables with copper conductor for various industrial and domestic applications where portable, movable equipment or flexibility make installation easier, Special formulated "Polyvinyl Chloride" (PVC) used for insulation and sheath tends to flexibility of cables,

The sheathing material provides resistance to oil, and moisture and superior mechanical strength without losing its flexibility. These cables can also be made available with FR-LSH & HFLS/ZHLS Compound on request

Multicore Round PVC Insulated Industrial Grade Copper Conductor and FR PVC Sheathed Flexible Cables, 1100 Volts as per IS:694/2010.

Nominal Cross Sectional Area of conductor	Number/ Nom. Dia of cond. strands	Thickness of Insulation (Nom)	Nominal Thickness of Sheath			Approx. Overall Diameter			Current Rating AC	Voltage Drop/ Amp/Mtr		Max, Conductor Resistance per KM at 20°C
			2 Core	3 Core	4 Core	2 Core	3 Core	4 Core		DC or Single Phase AC	3 Phase AC	
sq. mm	mm	mm	mm	mm	mm	mm	mm	mm	Amps	mV	mV	Ohms
0.5	16/0.20	0.6	0.9	0.9	0.9	6.2	6.5	7.0	4	83	72	39.0
0.75	24/0.20	0.6	0.9	0.9	0.9	6.6	6.9	7.5	7	56	48	26.0
1.0	32/0.20	0.6	0.9	0.9	0.9	6.9	7.3	7.9	11	43	37	19.5
1.5	30/0.25	0.6	0.9	0.9	1.0	7.4	7.8	8.7	13	31	26	13.3
2.5	50/0.25	0.7	1.0	1.0	1.0	8.8	9.4	10.2	18	18	16	7.98
4.0	56/0.30	0.8	1.0	1.0	1.0	10.2	10.9	11.9	24	11	9.6	4.95
6.0	84/0.30	0.8	1.1	1.1	1.2	11.5	12.2	13.6	31	8	7	3.30



Nominal Cross Sectional area of conductor	Number/ Nom. Dia of cond. strands	Thickness of Insulation (Nom)	Nominal Thickness of Sheath					Approx. Overall Diameter					Max. Conductor Resistance per KM at 20°C
			5 Core	6 Core	7 Core	8 Core	10 Core	5 Core	6 Core	7 Core	8 Core	10 Core	
Sq. mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	Ohms
0.5	16/0.20	0.6	0.9	0.9	0.9	1.0	1.0	7.8	8.2	8.2	9.4	11.0	39.0
0.75	24/0.20	0.6	0.9	1.0	1.0	1.0	1.1	8.3	9.4	9.4	10.4	11.8	26.0
1.0	32/0.20	0.6	1.0	1.0	1.0	1.0	1.1	9.0	9.8	9.8	10.9	12.5	19.50
1.5	30/0.25	0.6	1.0	1.0	1.0	1.1	1.1	9.8	10.7	10.7	12.0	13.7	13.30
2.5	50/0.25	0.7	1.0	1.1	1.1	1.2	1.3	11.8	12.8	12.8	14.0	16.8	7.98
4.0	56/0.30	0.8	1.1	1.2	1.2	1.3	1.4	13.8	15.5	15.8	16.8	20.4	4.95



MULTICORE ROUND PVC CABLES

Nominal Cross Sectional Area of Conductor	Number/ Nom. Dia of cond. strands*	Thickness of insulation (Nom)	Nominal Thickness of Sheath					Approx. Overall Diameter					Max. Conductor Resistance Per KM at 20°C
			12 Core	14 Core	16 Core	19 Core	24 Core	12 Core	14 Core	16 Core	19 Core	24 Core	
sq. mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	Ohms
0.5	16/0.20	0.6	1.0	1.1	1.1	1.1	1.2	11.6	12.0	12.7	13.2	15.4	39.0
0.75	24/0.20	0.6	1.1	1.1	1.2	1.2	1.3	12.4	12.8	13.8	14.3	16.8	26.0
1.0	32/0.20	0.6	1.1	1.1	1.2	1.3	1.4	12.9	13.7	14.4	15.1	18.0	19.50
1.5	30/0.25	0.6	1.1	1.2	1.2	1.3	1.4	14.2	14.8	15.8	16.6	19.4	13.30
2.5	50/0.25	0.7	1.3	1.3	1.4	1.4	1.5	17.3	18.0	19.5	20.4	23.8	7.98
4.0	56/0.30	0.8	1.4	1.4	1.5	1.5	1.6	20.6	22.0	23.8	25.2	28.5	4.95

Note: Available in 100 metres length with black outer sheath & in bigger packing on request.

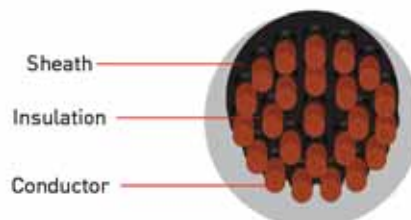
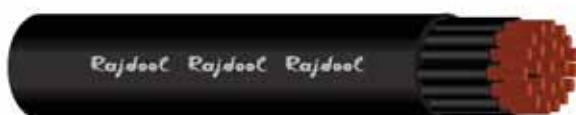
Any colour on specific request can be supplied.

*The number and diameter of conductor strands are for reference only. Conductor resistance as per IS:8130 is the governing criteria.

Conductor shall be of Class-V as per IS:8130

Core Identification:

- 2 CORE : Red & Black
- 3 CORE : Red, Black & Yellow-Green
- 4 CORE : Red, Yellow, Blue & Yellow-Green
- 5 CORE : Red, Yellow, Blue, Black & Grey
- 6 CORE : Red, Yellow, Blue, Yellow-Green, White & Black
- 7 CORE & Above : Number Printing on each core / Colour code as specified in IS:694



RoHS COMPLIANT

Release of certain harmful substances such as lead, mercury, cadmium and chromium etc. in the plastics/equipment are dangerous to the environment and health. European Union has adopted a directive on the restriction of the use of certain hazardous substances in electrical and electronics equipment commonly referred to as Restriction of Hazardous Substances directive or RoHS. Rajdoot Cables having RoHS compliance as per directive 2006/95/EC. This ensures that release of hazardous substances are eliminated to provide safety for human health and to give us green environment. An initiative for eco friendly environment by Rajdoot.



ANTI TERMITE AND ANTI RODENT

Termites and rodents cause extensive damage to paper, wood, plastic etc. In case of electrical installation, damaged caused by above pests may lead to short circuit which can become a cause for a major disaster, loss of property and human life. Rajdoot cables provide insulation with termite and rodent repulsion properties.



BEST COPPER USED

Rajdoot uses ETP grade annealed copper in wires and cables which is more than 99.95% pure and therefore ensures 101% conductivity (IACS).



ANNEALED COPPER ETP GRADE
101% CONDUCTIVITY (IACS) USED

PVC SUBMERSIBLE FLAT CABLES

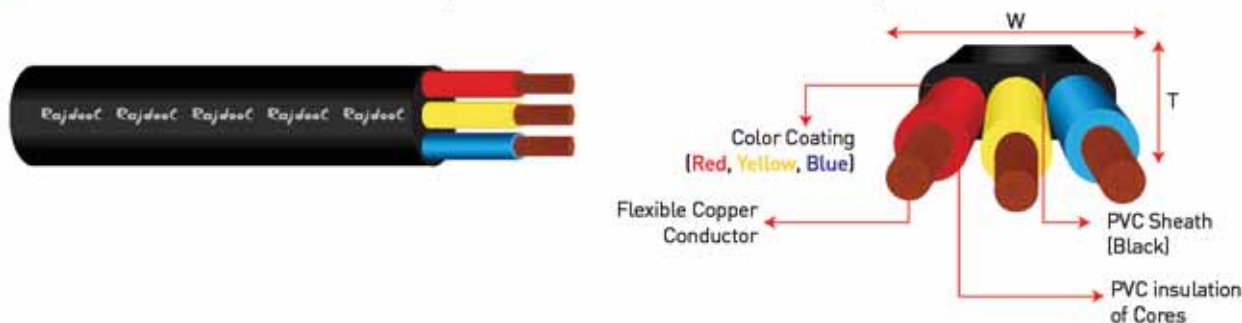
Three Core Flat PVC Insulated Industrial Grade Cable for Submersible use, 1100 Volts of IS:694/2010.

Nominal area of conductor	Number/ Size of wire for each Core	Thickness of Insulation (Nom.)	Thickness of Sheath (Nom.)	SHEATH Approx Overall Dimension		Max. Conductor Resistance at 20°C (Max.)	Current Carrying Capacity at 40°C
				Width (Nom.)	Height (Nom.)		
Sq. mm.	mm	mm	mm	mm	mm	Ohm/Km	Amps.
1.50**	22/0.30	0.6	0.9	10.1	4.7	12.1	13
2.50**	36/0.30	0.7	1.0	12.2	5.5	7.41	18
4.00	56/0.30	0.8	1.0	14.6	6.5	4.95	24
6.00	84/0.30	0.8	1.1	16.2	7.0	3.30	31
10.00	80/0.40	1.0	1.4	20.2	8.5	1.91	42
16.00	126/0.40	1.0	1.4	23.4	9.7	1.21	57
25.00	196/0.40	1.2	2.0	28.5	11.7	0.780	72
35.00	276/0.40	1.2	2.0	32.1	13.0	0.554	90

Note: Available in 500 + 5% metres packing in drums, Also available in 100 metres packing on request.

*The number and diameter of conductor strands are for reference only. Conductor resistance as per IS:8130 is the governing criteria

** Conductor shall be class-II for 1.5 and 2.5 Sqmm and for other sizes shall be of class V as per IS:8130.



CABLE SELECTION CHART FOR 3 CORE FLAT SUBMERSIBLE CABLES

CHART FOR 3 PHASE, 415-425 V AT 40°C (WITH DOL STARTER)

H.P	5	7.5	10.5	12.5	15.0	17.5	20.0	25.0	30	35	40	45	50	55	60	65	70	75	80
Amps.	7.5	11	15	19	22.5	26	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
Length (Mtrs.)	Size of Cable in SQ.MM.																		
10-70	1.5	1.5	2.5	2.5	4	4	6	10	10	16	16	25	25	35	35	35	50	50	50
80	1.5	2.5	2.5	4	4	4	6	10	10	16	16	25	25	35	35	35	50	50	50
90	1.5	2.5	2.5	4	4	6	6	10	10	16	16	25	25	35	35	35	50	50	50
100	1.5	2.5	4	4	4	6	6	10	10	16	16	25	25	35	35	35	50	50	50
125	2.5	4	4	6	6	10	10	10	10	16	16	25	25	35	35	35	50	50	50
140	2.5	4	4	6	10	10	10	10	10	16	16	25	25	35	35	35	50	50	50
180	4	4	6	10	10	10	10	16	16	25	25	25	25	35	35	35	50	50	50
200	4	6	6	10	10	10	16	16	16	25	25	25	35	35	35	35	50	50	50

CHART FOR 3 PHASE, 415-425 V AT 40°C (WITH STAR DELTA STARTER - DOUBLE CABLE)

H.P	5	7.5	10	12.5	15.0	17.5	20.0	25.0	30	35	40	45	50	55	60	65	70	75	80
Amps.	7.5	11	15	19	22.5	26	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
Length (Mtrs.)	Size of Cable in SQ.MM.																		
10-70	1.5	1.5	1.5	1.5	2.5	2.5	2.5	4	4	6	10	10	10	10	16	16	16	16	25
80	1.5	1.5	2.5	2.5	2.5	2.5	4	4	4	6	10	10	10	10	16	16	16	16	25
90	1.5	1.5	2.5	2.5	2.5	2.5	4	4	6	6	10	10	10	10	16	16	16	16	25
100	1.5	1.5	2.5	2.5	2.5	2.5	4	4	6	6	10	10	10	10	16	16	16	16	25
125	1.5	2.5	4	4	4	4	6	6	10	10	10	10	10	10	16	16	16	16	25
140	1.5	2.5	4	4	4	4	6	10	10	10	10	10	16	16	16	16	16	16	25
180	1.5	4	4	4	6	6	10	10	10	10	16	16	16	16	25	25	25	25	25
200	1.5	4	6	6	6	6	10	10	10	16	16	16	16	16	25	25	25	25	25

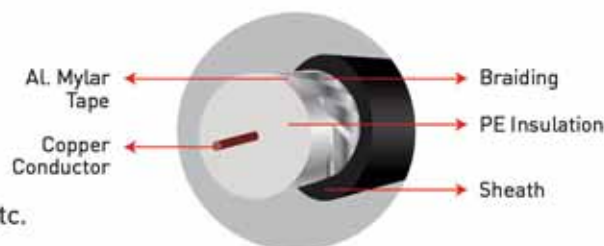
COMPARISON CHART OF PVC

Some comparative technical features are given below in details, between "Rajdoot" HRFR, FRLSH & HFLS/ZHLS wires and cables.

S. No.	Features	Heat Resistant & Flame Retardant PVC	Special Range	
			Flame Retardant Low Smoke & Halogen FR-LSH	Low Smoke HFLS/ZHLS
1	Insulation Material	Spl. HR PVC	Spl. PVC	Spl. Polymer
2	Insulation Property	Good	Good	Very Good
3	Temperature Rating	85°C	70°C	70°C
4	Thermal Stability	Good	Good	Very Good
5	Flame Retardancy	Very Good	Very Good	Excellent
6	Safety during Burning	Good	Good	Excellent
7	Requirement of critical oxygen index as per ASTMD-2863 to catch fire (%)	>30	>30	>35
8	Temperature Index	>250°C	>250°C	>280°C
9	Light Transmission (Visibility) during cable as per ASTMD-2843 Burning (%)	NA –	>40 Good	>80 Excellent
10	Release of Halogen Gas during Burning (%)	NA –	<20% Good	<0.5% Excellent
11	Abrasion Resistance during Installation	Good	Good	Good



CO-AXIAL CABLES



Application

Used in Cable TV operations, Computer networking etc.

Technical Data

S. No.	Type	Description
1	Size	RG-59, RG-6, RG-11
2	Conductor	Electrolytic grade annealed plain solid copper conductor
3	Insulation	Foam PE insulation over the conductor which act as a di-electric
4	Screen	Aluminium mylar tape is provided over the insulated conductor to shield the conductor and ensure disturbance free transmission of signals
5	Braiding	The braiding is generally provided with 60% coverage of ATC (Annealed Tinned Copper) / AL alloy wire
6	Outer Jacket	UV Resistant Black PVC Jacket
7	Marking	Progressive sequential Length Marking on Every Meter

Electrical Parameters

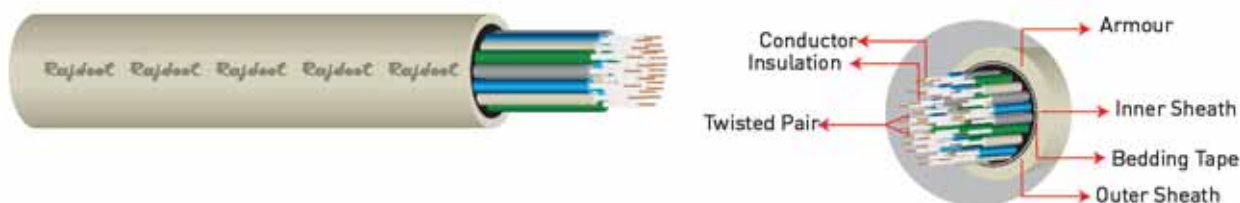
S. No.	Type	RG-11 Foam	RG-6 Foam	RG-59 Foam
1	Inner Conductor Dia (Nom)	1.63	1.02	0.8
	Max. Resistance (Ohm/100M) @ 20°C	0.84	2.13	3.55
2	Nom Capacitance (pF/mtr.)	53	53	53
3	Nom Impedance (Ohm)	75	75	75
4	Nom. Velocity Propagation (%)	85	85	85
5	Nom. Attenuation @ 25° (dB/100m)			
	@55 Mhz	2.82	1.95	6.73
	@83 Mhz	3.87	6.20	8.04
	@187 Mhz	5.74	9.15	11.81
	@211 Mhz	6.23	9.50	12.47
	@250 Mhz	6.72	10.50	13.45
	@300 Mhz	7.38	11.50	14.60
	@350 Mhz	7.94	12.45	15.71
	@400 Mhz	8.53	13.30	16.73
	@450 Mhz	9.02	14.35	17.72
	@500 Mhz	9.51	14.95	18.70
	@550 Mhz	9.92	15.70	19.52
6	Structural Return Loss (db/100m)			
	From 30 to 300 Mhz	>26	>28	>30
	From 300 to 550 Mhz	>24	>22	>24
7	Bending Radius, min (mm)	75	65	65

Construction Parameters

S. No.	Type Foam	RG-11 Foam	RG-6 Foam	RG-59 Foam
1	Conductor	Solid Bare Copper	Solid Bare Copper	Solid Bare Copper
2	Nom. Diameter (mm)	1.63	1.02	0.80
3	Dielectric	Foam PE	Foam PE	Foam PE
4	Nom. Diameter (mm)	7.11	4.57	3.55
5	Screen - First	Bonded AL Mylar Tape	Bonded AL Mylar Tape	Bonded AL Mylar Tape
6	Braiding - Second	ATC / AL Alloy wire	ATC / AL Alloy wire	ATC / AL Alloy wire
7	Nom. Coverage (%)	60	60	60
8	Jacket	PVC (Black)	PVC (Black)	PVC (Black)
9	Nom. Diameter (mm)	10.00	7.00	6.20

Note: Supplied in 90 metres & 305 metres project packaging.

TELEPHONE CABLES



Application

Cables used for indoor Telephone, Telephone Exchanges, Satellite Telecommunication Systems, Industrial Plant Communication Systems, EPABX Systems, Closed Circuit Security Systems, In-House telephone wiring and various other equipments involving telephones.

Standard

Cables are generally made as ITD Specification No. S/WS 113B, 113C.&114B or as per Customer's specification.

Construction

Solid annealed tinned/bare copper conductor, PVC insulated cores suitably colour coded for distinct identification, twisted to form pairs, pairs laid up, PVC sheathed. Armoured Cables are provided with Galvanised steel wire/strip armouring and then Sheathed again with PVC.

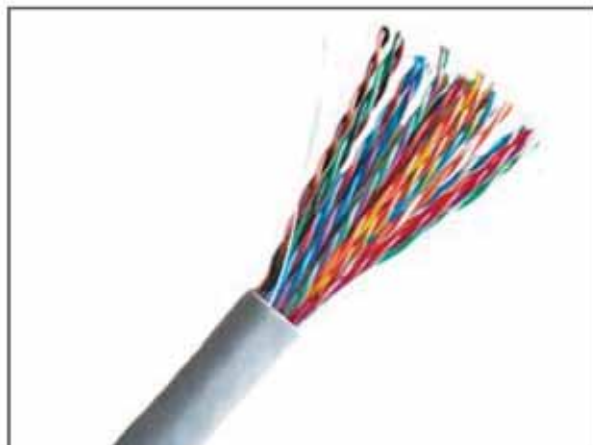
Design / Material Options

Conductor	: Tinned copper/Bare copper
Insulation	: PVC / Polyethylene as per IS:13176/1991.
Shielding	: Over all shielded / Individual pair shielded and over all shielded with polyester backed aluminium tape or fine copper wire braid (manufactured against customer's orders only for economical runs.)
Sheathing	: FR & FRLSH PVC/Polyethylene
Conductor size Cable	: 0.4/0.5/0.6/0.7/0.8/0.9 mm
Configuration	: 1 pair to 200 pair

Note : Available in 90 metres length in carton packaging & 180 metres project lengths in polywrap packaging.

Salient Features for Telephone Cable

- Hard grade PVC insulation is used for long life and stable properties of cables.
- Staggered lays of twisted pairs are used to ensure minimum cross talk.
- Sizing and processing of conductor and insulated cores is done in precisely controlled manner on automatic modern machines to have optimum values of capacitance unbalance image and cross talk attenuation and characteristic impedance
- Shielding is done to protect from outside / inter pair interference as per specific needs.



CAT 5e LAN CABLES - COMPLETE NETWORKING SOLUTION

CAT 5e

Introduction

Rajdoot Networking cables allows device to access high-speed networks / internet data. The cables are verified to the performance requirements of ISO/IEC11801, TIA/EIA 568B.2 Unshielded twisted pair (UTP) cable is used in many home and business-based Ethernet networks. It has four pairs of wires that are housed inside of the lining of the cable. Each pair is twisted to prevent interference from other devices on the network.

Enhanced performance cable for transmission of high speed data, digital and analogue voice and video [RGB] signals on LANs. supports Gigabit Ethernet (1000 base-T) standard. Operates at bandwidth up to 100MHz.

Electrical characteristics		Technical Requirement / Cable Construction	
Characteristic Impedance	100±6 Ω @ 1-100MHz	Conductor Type	24 AWG Solid Bare Annealed Copper
DC Resistance	93.8 Ω/Km (max.)	Insulation Material	High Density Polythene
Voltage Rating	72 Vdc Max.	Pairs	2 Insulated Conductors twisted together
Insulation Resistance	500 MΩ/Km (min.) @500Vdc	Sheath Material	PVC
NVP (%)	69%	Standard Colour	Grey
Conductor Resistance	<9.38 Ω/100M	Overall Diameter of Cable	5 ± 0.3mm (Nom.) 4 twisted pair
Mutual Capacitance	5.6nF/100M nominal	Printing	Each meter printed with sequential Length Counter
Resistance Unbalance	5% Max.	Mechanical Properties	
Capacitance Unbalance	330pF/100m	Pulling Force	11.5 kg
Delay Skew	<25nS Max.	Operating Temp.	-10°C to +60°C
Bending Radius	< 4 X Cable Diameter at - 20°C ± 1°C	Installation Temp.	0°C to +50°C
Operating Voltage	72V	Min. Bending Radius	4 x Outer Diameter (Operating) 8 x Outer Diameter (Installation)
Dielectric Strength	1.0KV dc or 0.75KV ac for 1 min.		

Colour Code

- 1 Pair - White - Blue and Blue
- 2 Pair - White - Orange and Orange
- 3 Pair - White - Green and Green
- 4 Pair - White - Brown and Brown



Transmission Parameter as per 100 Mtr.							
Frequency	Insertion Loss (dB/100M)	NEXT (dB)	PSNEXT (dB)	ELFEXT	PSELFEXT (dB)	RL (dB)	ACR (dB)
1	2.00	65.3	62.3	63.8	60.8	20.0	63.3
4	4.10	56.3	53.3	51.8	48.8	23.0	52.2
8	5.80	51.8	48.8	45.7	42.7	24.5	46.0
10	6.50	50.8	47.3	43.8	40.8	25.0	43.8
16	8.20	47.2	44.4	39.7	36.7	25.0	39.0
20	9.30	45.8	42.8	37.8	34.8	25.0	36.5
25	10.40	44.3	41.3	35.8	32.8	24.3	33.9
31.25	11.70	42.9	39.9	33.9	30.9	23.6	31.2
62.50	17.00	38.0	35.4	27.9	24.9	21.5	21.4
100	22.00	35.3	32.3	23.8	20.8	20.1	13.3

Note: Available in 305 metres box packing

CAT 6 LAN CABLES - COMPLETE NETWORKING SOLUTION

CAT 6 (with star separator)

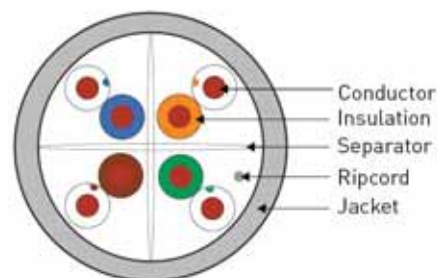
Introduction

Rajdoot Networking Cables allows device to access high-speed networks/internet data. The Cables are verified to the performance requirements of ANSI/TIA/ EIA-568-B.2-1 ISO/IEC 11801 / and AS / NZS 3080 Unshielded twisted pair (UTP) cable is used in many home and business-based Ethernet networks. It has four pairs of wires that are housed inside of the lining of the cable. Each pair is twisted to prevent interference from other devices on the network. Enhanced performance cable for transmission of high speed data digital and analogue voice and video (RGB) signals on LANs Supports Gigabit Ethernet (1000 base-T) standard. Operates at bandwidth up to 250MHz.

Electrical characteristics		Technical Requirement / Cable Construction	
Characteristic Impedance	100±6 Ω @ 1-250MHz	Conductor Type	23 AWG Solid Bare Annealed Copper
DC Resistance	72Ω/km (max.)	Insulation	High Density Polythene
Voltage Rating	72 Vdc max.	Pairs	2 Insulated Conductors twisted together
Insulation Resistance	500 MΩ/Km (min.) @500Vdc	Sheath	PVC
NVP (%)	69%	Standard Colour	Grey
Conductor Resistance	<7.20Ω/100M	Overall Diameter of Cable	6 ± 0.3mm (Nom.) 4 twisted pair
Mutual Capacitance	5.6nF/100M nominal	Printing	Each meter printed with sequential Length Counter
Resistance Unbalance	5% Max.	Mechanical Properties	
Capacitance Unbalance	330pF/100M	Pulling Force	11.5 kg
Delay Skew	<45nS	Operating Temp.	-10°C to +60°C
Bending Radius	< 4 X Cable Diameter at - 20°C ± 1°C	Installation Temp.	0°C to +50°C
Operating Voltage	72V	Min. Bending Radius	4 x Outer Diameter (Operating) 8 x Outer Diameter (Installation)
Dielectric Strength	1.0KV dc or 0.75KV ac for 1 min.		

Colour Code

- 1 Pair - White - Blue and Blue
- 2 Pair - White - Orange and Orange
- 3 Pair - White - Green & Green
- 4 Pair - White - Brown and Brown



Transmission Parameter as per 100 Mtr.							
Frequency	Insertion Loss (DB/100M)	NEXT (DB)	PSNEXT (DB)	ELFEXT	PSELFEXT (DB)	RL (DB)	ACR (DB)
1	2.00	74.3	72.3	67.8	64.8	20.0	72.3
4	3.90	65.3	63.3	55.8	52.8	23.0	61.5
8	5.30	60.8	58.8	49.7	46.7	24.5	55.5
10	6.00	59.3	57.3	47.8	44.8	25.0	53.3
16	7.60	56.2	54.2	43.7	40.7	25.0	48.6
20	8.50	54.8	52.8	41.8	38.8	25.0	46.3
25	9.50	53.3	51.3	39.8	36.8	24.3	43.8
31.25	10.70	51.9	49.9	37.9	34.9	23.6	41.2
62.50	15.40	47.4	45.4	31.9	28.9	21.5	32.0
100	19.80	44.3	42.3	27.8	24.8	20.1	24.5
200	29.0	39.8	37.8	21.8	18.8	18.0	10.8
250	32.8	38.3	36.3	19.8	16.8	17.3	5.5

Note: Available in 305 metres box packing

CCTV CAMERA CABLES

CCTV Cables

Introduction

Rajdoot CCTV Cables are offered in two types namely 4+1 CCTV Cable and 3+1 CCTV cable. Coaxial Cables form the carrier for video signal and the other '4 cores' or '3 cores' form the carriers for power. Coaxial cables are designed to transmit the complete video frequency range with minimum distortion or attenuation, making them an excellent choice for CCTV.

Rajdoot CCTV cables are designed to optimize the quality of video signals, which are transmitted through the Coaxial Cable in the CCTV.

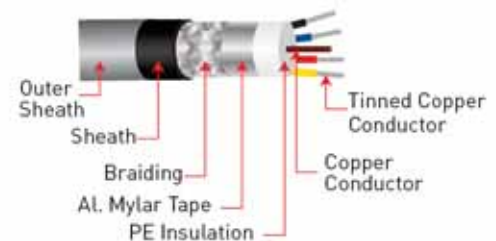
The Coaxial cable consists of solid annealed bare copper conductor of electrolytic grade which is insulated with foamed dielectric, aluminium foil taped, jelly flooded, braided with Al. Alloy and then jacketed with UV PVC.

Topmost quality of construction of coaxial cable in Rajdoot CCTV cables ensures distortion free video signals and thus a clear picture over complete low frequency bandwidth of transmission in such applications.

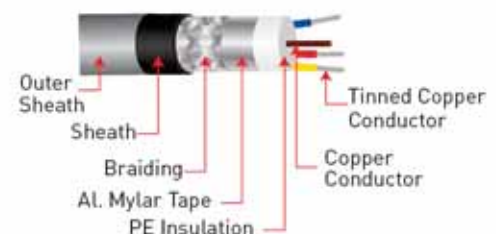
The impedance of coaxial cable is 75, which matches the CCTV equipment. This matching ensures adequate signal strength. No reflection and best picture quality.

Technical Requirement			
S. No.	Particular	3+1 CCTV	4+1 CCTV
Co-Axial Cable			
1.	Conductor		
	Material	Annealed Bare Copper	Annealed Bare Copper
	No. of Wire/ Dia. of wire	0.80 ± 0.002 mm	0.80 ± 0.002 mm
2.	Insulation		
	Material	Gas Injected Polyethylene	Gas Injected Polyethylene
	Thickness of Insulation (Nom.)	1.30 mm	1.30 mm
	Dia of Insulation	3.50 ± 0.20 mm	3.50 ± 0.20 mm
3.	Overall Shielded (Braided)		
	Material	Al. Foil - 100%	Al. Foil - 100%
	Material	Alum. Alloy	Alum. Alloy
	Coverage	55%	55%
4.	Flooding Compound	Petroleum Jelly	Petroleum Jelly
Outer Sheath			
	Material	PVC	PVC
	Dia. of Sheath	5.50 mm ± 0.20 mm	5.50 mm ± 0.20 mm
1.	Conductor		
	Material	Annealed Tinned Copper	Annealed Tinned Copper
	No. of Wire/ Dia of wire	14/0.13 ± 0.002 mm	14/0.13 ± 0.002 mm
2.	Insulation		
	Material	PVC Type -A	PVC Type -A
	Thickness of Insulation (Nom.)	0.3	0.3
	Dia of Insulation	1.40 mm	1.40 mm
Final Cable			
1.	Barrier Tape		
	Thickness of Tape	0.025mm	0.025mm
	Coverage	100%	100%
2.	Outer Sheath		
	Material	PVC Type ST-1	PVC Type ST-1
	Thickness of Sheath (Nom.)	0.90 mm	0.90 mm

Cross Section View for 4+1 CCTV



Cross Section View for 3+1 CCTV



SPEAKER CABLES

Application

Speaker cables are highly recommended for use in connecting speakers, public address system for clear and distortion free voice with low dB loss.

Cable Construction

The cables are manufactured with bright annealed plain flexible electrolytic grade copper conductor bunched compactly, insulated with speciality formulated PVC compound. Each core is uniquely designed for easy identification in order to offer uniform capacitance throughout length the distance between the two conductors is maintained uniformly.

Colour Availability: Transparent/Black / white with red tracer for polarity identification also available in grey.

Packing : The delivery length available in 100 metres coils

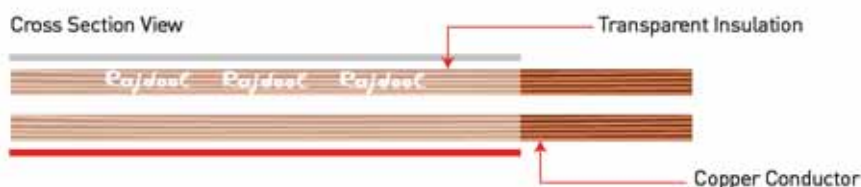
Cable Design Parameters

Conductor Construction			Maximum Overall Dimensions (W X H) (mm)
Equivalent AWG	Nominal Cross Sectional Area (Sq. mm)	Max. DC Conductor Resistance at 20°C (0/km)	
22	0.5	39.0	4.2 X 2.1
19	0.75	26.0	4.7 X 2.4
18	1	19.5	5.7 X 2.9
16	1.5	13.3	6.0 X 3.0
14	2.5	7.98	7.0 X 3.6
12	4	4.95	8.4 X 4.1
10	6	3.30	9.6 X 4.7

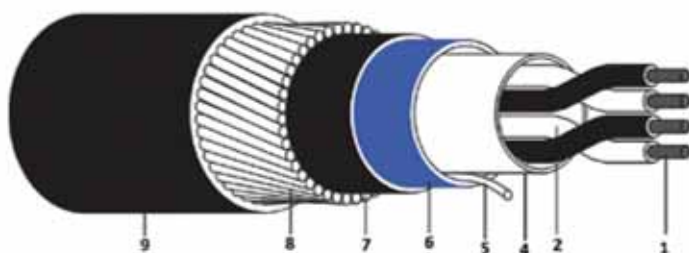
Recommended length

Wire Size	2Ω load	4Ω load	6Ω load	8Ω load
22 AWG	3ft (0.9m)	6ft (1.8m)	9ft (2.7m)	12ft (3.6m)
19 AWG	5ft (1.5m)	10ft (3m)	15ft (4.5m)	20ft (6m)
18 AWG	8ft (2.4m)	16ft (4.9m)	24ft (7.3m)	32ft (9.7m)
16 AWG	12ft (3.6m)	24ft (7.3m)	36ft (11m)	48ft (15m)
14 AWG	20ft (6.1m)	40ft (12m)	60ft (18m)	80ft (24m)
12 AWG	30ft (9.1m)	60ft (18m)	90ft (27m)	120ft (36m)
10 AWG	50ft (15m)	100ft (30m)	150ft (46m)	200ft (61m)

Cross Section View



INDIVIDUAL & OVERALL SCREENED INSTRUMENT CABLES



APPLICATION

Generally used within industrial manufacturing process plants for telecommunication, data and voice or transmission of signals

DESCRIPTION

Single pair and multi-pair cables with copper conductor, PVC insulated, overall screened and PVC sheathed. voltage rated at 300/500V

STANDARD

Cables are generally made as BS 5308 Part-2 : Type-2 or as per customer's specification.

CONSTRUCTION

- 1 **Conductor** : Solid / stranded, tinned / bare / silver-plated annealed high conductivity EC grade copper.
- 2 **Insulation** : PVC (Polyvinyl Chloride).
- 3 **Pairing** : Two insulated cores shall be uniformly twisted together to form a pair with maximum lay length of 100 mm.
Note: Two pair cables with overall screen shall have four cores laid in quad formation.
- 4 **Core Wrap** : Twisted pairs are laid up together, Melinex/Polyester tape applied helically over the laid up cores.
- 5 **Drain Wire** : Annealed Tinned Copper wire normally provided with both individual and overall screen.
- 6 **Overall Screening** : Accumulated pairs screened with aluminium/mylar tape, helically applied with the metallic side down, in electrical contact with a tinned annealed copper drain wire.
- 7 **Bedding** : PVC (Polyvinyl Chloride).
- 8 **Armouring** : Galvanized steel round wire over the bedding.
- 9 **Sheathing** : PVC (Polyvinyl Chloride).

RANGE

No. of Pairs : 1 pair to 37 pairs

Conductor size (mm²) : 0.5 mm² to 1.5 mm²

Conductor Size	Resistance at 20°C	Mutual Capacitance (PE)		Mutual Capacitance (PVC)		LR Ratio
		Overall Screen#	Individual Screen	Pair Adjacent core	Between any core and screen	
mm ²	(Ohm/km)	(nF/km)	(nF/km)	(nF/km)	(nF/km)	(mH/Ohm)
0.5	36.8	75	115	250	400	25
0.75	25.0	75	115	250	400	25
1.0	18.4	75	115	250	400	25
1.5	12.3	85	120	250	400	40

Note: #Except for one pair and two pair

BENDING RADIUS :

Unarmoured : 5 X Cable Overall Diameter.

Armoured : 6 X Cable Overall Diameter

GENERAL CONSTRUCTION OF L.T. PVC/XLPE CABLES

Power Cable Steel Strip, Armoured


Conductor:
Aluminium/Copper

Insulation:
XLPE/ PVC

Inner Sheath:
PVC Type
ST1 or ST2

Armour:
Galvanised
Steel Strip

Outer Sheath

IS Specification

8130

7098/5831

5831

3975

5831

Control Cable Steel Strip, Armoured

Conductor:
EC Conductivity,
Electrolytic
Grade Copper

Insulation:
PVC Type A or C

Inner Sheath:
PVC Type
ST1 or ST2

Armour:
Galvanised
Steel Strip

Outer Sheath



Classification of PVC/XLPE Compound

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

CONDUCTOR

Rajdoot offers cables with Electrolytic Copper & Aluminium conductor in form of Solid, Stranded Circular, Compacted Circular and Shaped as per IS:8130.

INSULATION

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

Poly-Vinyl Chloride (PVC) : We offer general purpose PVC of 70°C [Type-A] and Heat Resistant PVC of 85°C [Type-C] as per IS:5831.

Cross Linked Polyethylene (XLPE) : The 90°C Thermoset dielectric.

CORE IDENTIFICATION & COLOUR SCHEME

Codes are identified by colour scheme of insulation. The Following colour scheme is adopted :

- 1 Core : Red, Black, Yellow, Blue or Natural
- 2 Core : Red and Black
- 3 Core : Red, Yellow and Blue
- 4 Core : Red, Yellow, Blue and Black (reduced neutral core is also Black)
- 5 Core : Red, Yellow, Blue, Black and Grey

For Cables having more than 5 Cores – Two adjacent cores (counting and directional) in each layer are coloured Blue & Yellow respectively and the remaining cores are Grey.

INNER SHEATH

For all cables two or multi cores, a common covering (Inner Sheath) is provided over the laid up cores either by extrusion or by wrapping of PVC tape having Type ST-2 as per IS:5831. Single core cables do not require inner sheath.

Options : FR/FRLSH as per customer requirements.

GENERAL CONSTRUCTION OF L.T. PVC/XLPE CABLES

ARMOURING

Depending upon the application, the cables can be armoured. The armouring can be round steel wire or steel strips. In case of cables where calculated diameter over the inner sheath does not exceed 13 mm, the armour consists of galvanized round steel wires. Above this size, the armour can be galvanized flat steel strips as per IS: 3975 or galvanized round steel wires as per customer's 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.

OUTER SHEATH

Over the armouring or in case of unarmoured cables, over the inner sheath (for single core cables over the insulation), a tough outer sheath of PVC is applied by extrusion. This is normally black in colour. This provides a tough but smooth outer covering to cables. The trade mark Rajdoot® Cables along with the size of the cable and voltage grade are embossed on the outer sheath. Wherever desired the customer's name and sequential marking can also be arranged on the cable. The embossing script repeats at desired length of cable.

CABLE CODES

The following codes are used for designating the type of cable:

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

TESTING OF PVC CABLES

Testing is a vital part of cable manufacturing and all raw materials to finish cables are thoroughly tested to ensure the quality. Rajdoot Cables has a well equipped testing laboratory for carrying out electrical, mechanical and chemical tests which are required as per relevant specifications. The various tests as provided in the Indian Standards are carried out on Rajdoot Cables. These are classified in three different groups:

1) Routine Tests 2) Type Tests and 3) Acceptance Tests.

ROUTINE TESTS

The Following tests constitute routine tests which are carried on each and every length of cable before it leaves the factory:

- Conductor Resistance Tests:** This test ensures that conductor resistance is within the specified limit thereby ensuring that the continuity of conductor is maintained throughout the cable length and 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.
- High Voltage Test:** This test ensures that the insulation will safely withstand the rated voltage with permissible variation in normal operation.

TYPE TESTS

These tests are carried out on samples taken from each production lot. They are carried out to prove conformity as regards the general qualities and to the specification to particular type of cable. These tests are enumerated in the relevant Indian Standards.

ACCEPTANCE TESTS

The customers can request the various acceptance tests as provided in the relevant Indian standard to be carried out before accepting the cables.

ELECTRICAL PARAMETERS - CONDUCTOR

MAX. CONDUCTOR RESISTANCE (D.C.) AT 20°C FOR INSULATED CABLES CONFIRMING 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.	ohm/km	ohm/km	ohm/km	ohm/km	ohm/km	ohm/km
0.5	36.0	-	-	-	39.0	40.1
0.75	24.5	-	-	-	26.0	26.7
1	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	4.61	7.41	4.61	7.41	4.95	5.09
6	3.08	4.61	3.08	4.61	3.30	3.39
10	1.83	3.08	1.83	3.08	1.91	1.95
16	1.15	1.91	1.15	1.91	1.21	1.24
25	-	-	0.727	1.20	0.780	0.795
35	-	-	0.524	0.868	0.554	0.565
50	-	-	0.387	0.641	0.386	0.393
70	-	-	0.268	0.443	0.272	0.277
95	-	-	0.193	0.320	0.206	0.210
120	-	-	0.153	0.253	0.161	0.164
150	-	-	0.124	0.206	0.129	0.132
185	-	-	0.0991	0.164	0.106	0.108
240	-	-	0.0754	0.125	0.0801	0.0817
300	-	-	0.0601	0.100	0.0641	0.0654
400	-	-	0.0470	0.0778	0.0486	0.0495
500	-	-	0.0366	0.0605	0.0384	0.0391
630	-	-	0.0283	0.0469	0.0287	0.0292
800	-	-	0.0221	0.0367	-	-
1000	-	-	0.0176	0.0291	-	-

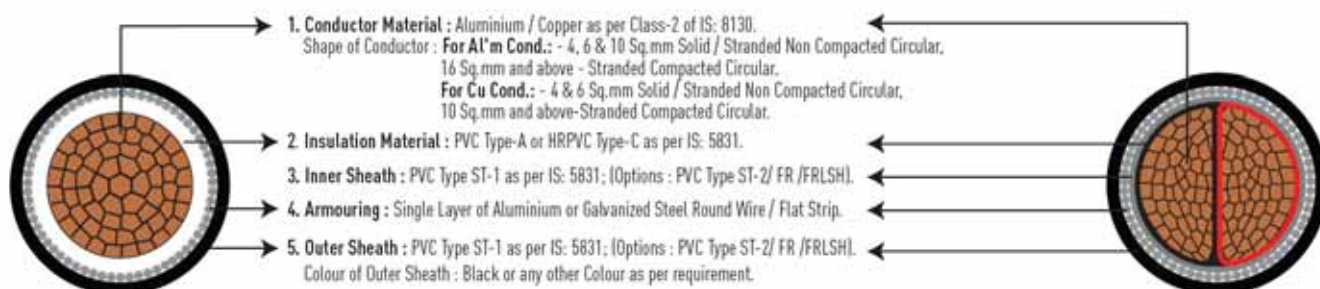
CALCULATED CONDUCTOR RESISTANCE (A.C.) - ALUMINIUM/COPPER (AT OPERATING TEMPERATURE)

Nominal cross sectional area of conductor	Operating Temperature			
	70°C		90°C	
	Plain Copper	Aluminium	Plain Copper	Aluminium
Sq. mm.	ohm/km	ohm/km	ohm/km	ohm/km
1.5	14.50	21.72	-	-
2.5	8.90	14.52	-	-
4	5.53	8.89	5.90	9.50
6	3.70	5.53	3.94	5.91
10	2.20	3.70	2.34	3.95
16	1.38	2.29	1.47	2.45
25	0.87	1.44	0.931	1.54
35	0.63	1.04	0.671	1.11
50	0.464	0.769	0.495	0.821
70	0.322	0.532	0.343	0.567
95	0.232	0.384	0.248	0.411
120	0.184	0.304	0.197	0.325
150	0.1488	0.248	0.159	0.265
185	0.1189	0.198	0.127	0.211
240	0.0912	0.152	0.0976	0.162
300	0.0733	0.122	0.0778	0.130
400	0.0580	0.096	0.0618	0.1023
500	0.0459	0.076	0.0489	0.0807
630	0.0368	0.061	0.0391	0.0648
800	0.0303	0.0501	0.0319	0.0530
1000	0.0255	0.0422	0.0268	0.0443

TECHNICAL DATA - PHYSICAL

1.1 KV SINGLE CORE, ALUMINIUM / COPPER CONDUCTOR, PVC INSULATED, HARD DRAWN
ALUMINIUM ARMoured / UNARMoured, PVC SHEATHED CABLES CONFIRMING TO IS:1554 (PART - 1)

Nominal Cross sectional area of conductor	Unarmoured					Armoured					
	Nominal thickness of insulation	Nominal thickness of outer sheath	Approx. overall diameter	Approximate weight of cable		Nominal thickness of insulation	Armours dimensions (wire/strip)	Minimum thickness of outer sheath	Approx. overall diameter	Approximate weight of cable	
				AL.	Copper					AL.	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

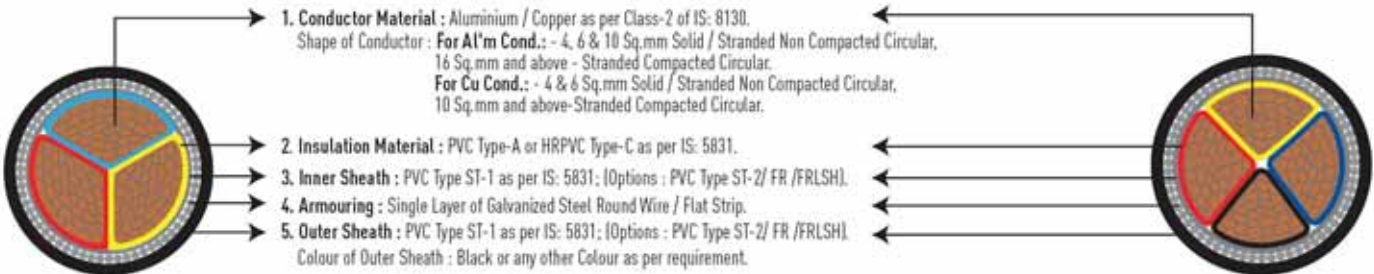
1.1 KV TWO CORE, ALUMINIUM / COPPER CONDUCTOR, PVC INSULATED, ARMoured / UNARMoured,
PVC SHEATHED CABLES CONFIRMING TO IS:1554 (PART 1)

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		Armours dimensions (wire/strip)	Minimum thickness of outer sheath	Approx. overall diameter	Approximate weight of cable	
					AL.	Copper				AL.	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

TECHNICAL DATA - PHYSICAL

1.1 KV THREE CORE, ALUMINIUM / COPPER CONDUCTOR, PVC INSULATED, ARMoured / UNARMoured, PVC SHEATHED CABLES CONFIRMING TO IS:1554 (PART - 1)

Nominal cross section 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		Armours dimensions (wire/strip)	Minimum thickness of outer sheath	Approx. overall diameter	Approximate weight of cable	
					AL.	Copper				AL.	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



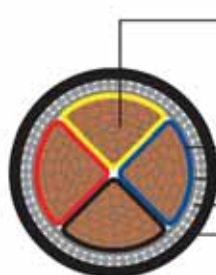
1.1 KV THREE & HALF CORE ALUMINIUM / COPPER CONDUCTOR, PVC INSULATED, ARMoured / UNARMoured, PVC SHEATHED CABLES CONFIRMING TO IS:1554 (PART - 1)

Nominal cross section 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		Armours dimensions (wire/strip)	Minimum thickness of outer sheath	Approx. overall diameter	Approximate weight of cable	
					AL.	Copper				AL.	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

TECHNICAL DATA - PHYSICAL

1.1 KV FOUR CORE, ALUMINIUM / COPPER CONDUCTOR, PVC INSULATED,
ARMoured / UNARMoured, PVC SHEATHED CABLE CONFIRMING 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		Armours dimensions (wire/strip)	Minimum thickness of outer sheath	Approx. overall diameter	Approximate weight of cable	
					AL.	Copper				AL.	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	0.3	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	0.4	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	0.5	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	0.6	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. Conductor Material : Aluminium / Copper as per Class-2 of IS: 6130.
Shape of Conductor : For Al'm Cond.: - 4, 6 & 10 Sq.mm Solid / Stranded Non Compacted Circular, 16 Sq.mm and above - Stranded Compacted Circular.
For Cu Cond.: - 4 & 6 Sq.mm Solid / Stranded Non Compacted Circular, 10 Sq.mm and above-Stranded Compacted Circular.
2. Insulation Material : PVC Type-A or HRPVC Type-C as per IS: 5831.
3. Inner Sheath : PVC Type ST-1 as per IS: 5831; (Options : PVC Type ST-2/ FR /FRLSH).
4. Armouring : Single Layer of Galvanized Steel Round Wire / Flat Strip.
5. Outer Sheath : PVC Type ST-1 as per IS: 5831; (Options : PVC Type ST-2/ FR /FRLSH).
Colour of Outer Sheath : Black or any other Colour as per requirement.

CURRENT RATINGS

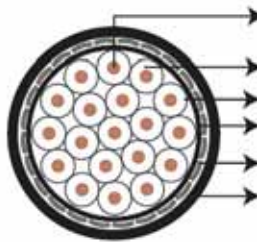
CURRENT RATINGS (A.C.) FOR 1.1 KV PVC INSULATED ALUMINIUM & COPPER CONDUCTOR POWER CABLES

Nominal area of conductor	Single Core Three Cables				Multi Core Cables			
	In Ground		In Air		In Ground		In Air	
	Amp.		Amp.		Amp.		Amp.	
sq.mm.	Al.	Cu.	Al.	Cu.	Al.	Cu.	Al.	Cu.
6	39	49	35	44	40	50	35	45
10	51	65	47	60	55	70	47	60
16	66	85	64	82	70	90	59	78
25	86	110	84	110	90	115	78	105
35	100	130	105	130	110	140	99	125
50	120	155	130	165	135	165	125	155
70	140	190	155	205	160	205	150	195
95	175	220	190	245	190	240	185	230
120	195	250	220	280	210	275	210	265
150	220	280	250	320	240	310	240	305
185	240	305	290	370	275	350	275	350
240	270	345	335	425	320	405	325	410
300	295	375	380	475	355	450	365	465
400	325	400	435	550	385	490	420	530
500	345	425	480	590	425	540	475	605
630	390	470	550	660	465	640	540	785
800	450	530	610	725	-	-	-	-
1000	500	590	680	870	-	-	-	-

TECHNICAL DATA - PHYSICAL

1.5 SQ MM. SOLID COPPER CONDUCTOR, PVC INSULATED, ARMoured / UNARMoured, PVC SHEATHED, MULTICORE CONTROL CABLES -- 1.1KV CONFIRMING 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. overall diameter	Approx. weight of cable	Armours dimensions (wire/strip)	Minimum thickness of outer sheath	Approx. overall diameter	Approx. weight of cable
	mm.	mm.	mm.	mm.	mm.	kg./km.	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



1. Conductor: Solid / Stranded Annealed Bare Copper as per Class-2 of IS: 8130; (Options : Tinned).
2. Insulation Material : PVC Type-A or HRPVC Type-C as per IS: 5831.
3. Core Identification : Upto 5 Cores - By Colour coding & above 5 Cores - By Colour Coding / Number printing on cores as per IS:1554 Part-1.
4. Inner Sheath : PVC Type ST-1 as per IS: 5831; (Options : PVC Type ST-2/ FR /FRLSH).
5. Armouring : Single Layer of Galvanized Round Wire / Flat Strip.
6. Outer Sheath : PVC Type ST-1 as per IS: 5831; (Options : PVC Type ST-2/ FR /FRLSH).
Colour of Outer Sheath : Black or any other Colour as per requirement.

2.5 SQ MM. SOLID COPPER CONDUCTOR, PVC INSULATED, ARMoured / UNARMoured, PVC SHEATHED, MULTICORE CONTROL CABLES -- 1.1KV CONFIRMING 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. overall diameter	Approx. Weight of cable	Armours dimensions (wire/strip)	Minimum thickness of outer sheath	Approx. overall diameter	Approx. weight of cable
	mm.	mm.	mm.	mm.	mm.	kg./km.	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 RATINGS (A.C.) FOR COPPER CONDUCTOR, MULTICORE 650/1100 VOLTS UNARMoured OR ARMoured
CONTROL CABLES CONFIRMING 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

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

CURRENT RATINGS (A.C.) FOR TWO SINGLE CORE
UNARMoured OR ARMoured CABLES

Nominal area of conductor	Laid Direct					
	In Ground		In Ducts		In Air	
	Aluminium	Copper	Aluminium	Copper	Aluminium	Copper
	sq.mm	amp.	sq.mm	amp.	sq.mm	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 RATINGS (A.C.) FOR THREE SINGLE CORE
UNARMoured OR ARMoured CABLES

Nominal area of conductor	Laid Direct					
	In Ground		In Ducts		In Air	
	Aluminium	Copper	Aluminium	Copper	Aluminium	Copper
	sq.mm	amp.	sq.mm	amp.	sq.mm	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 RATINGS (A.C.) FOR TWO CORE UNARMoured
OR ARMoured CABLES

Nominal area of conductor	Laid Direct					
	In Ground		In Ducts		In Air	
	Aluminium	Copper	Aluminium	Copper	Aluminium	Copper
	sq.mm	amp.	sq.mm	amp.	sq.mm	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 RATINGS (A.C.) FOR THREE, THREE & HALF, FOUR
CORE UNARMoured OR ARMoured CABLES

Nominal area of conductor	Laid Direct					
	In Ground		In Ducts		In Air	
	Aluminium	Copper	Aluminium	Copper	Aluminium	Copper
	sq.mm	amp.	sq.mm	amp.	sq.mm	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

CURRENT RATING 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 (Center to center 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 (Center to center 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



CURRENT RATING 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 / W)											
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

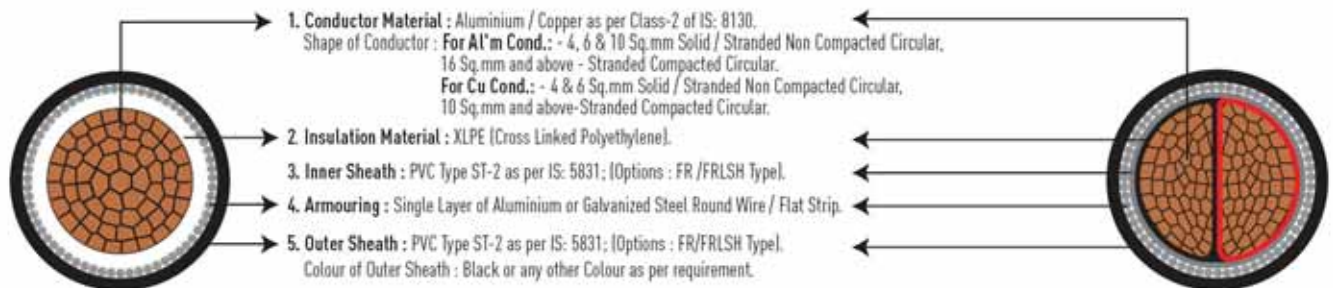
RATING FACTORS FOR VARIATION IN THERMAL
RESISTIVITY OF SOIL TWIN & MULTI-CORE CABLES

Nominal area of conductor	Laid Direct in the Ground						Single - Way Ducts					
	Thermal Resistivity of Soil (°C cm / W)											
sq.mm.	100	120	150	200	250	300	100	120	150	200	250	300
1.5	1.10	1.05	1.00	0.92	0.86	0.81	1.05	1.03	1.00	0.96	0.91	0.88
2.5	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	1.10	1.05	1.00	0.92	0.86	0.81	1.05	1.03	1.00	0.96	0.91	0.88
5	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	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	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	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	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	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	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	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	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	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	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	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	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	1.19	1.10	1.00	0.89	0.81	0.75	1.11	1.06	1.00	0.92	0.86	0.81

TECHNICAL DATA - PHYSICAL

1.1 KV SINGLE CORE, ALUMINIUM / COPPER CONDUCTOR, XLPE INSULATED, HARD DRAWN ALUMINIUM ARMoured / UNARMoured, PVC SHEATHED CABLES CONFIRMING 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	Armours dimensions (wire/strip)	Minimum thickness of outer sheath	Approx. Overall diameter	Approx. weight of cable	
				AL.	Cu.					AL.	Cu.
sq.mm.	mm.	mm.	mm.	kg./km.	kg./km.	mm.	mm.	mm.	mm.	kg./km.	kg./km.
1.5	0.70	1.80	6.70	-	65	-	-	-	-	-	-
2.5	0.70	1.80	7.10	-	80	-	-	-	-	-	-
4	0.70	1.80	7.60	-	100	-	-	-	-	-	-
6	0.70	1.80	8.20	90	120	1.00	1.40	1.24	10.60	145	180
10	0.70	1.80	9.00	105	165	1.00	1.40	1.24	11.40	170	230
16	0.70	1.80	10.20	130	225	1.00	1.40	1.24	12.70	200	295
25	0.90	1.80	12.00	180	325	1.20	1.40	1.24	14.20	260	410
35	0.90	1.80	13.00	215	425	1.20	1.40	1.24	15.20	305	515
50	1.00	1.80	14.50	265	550	1.30	1.40	1.24	16.80	365	650
70	1.10	1.80	16.20	350	760	1.40	1.40	1.24	18.70	460	870
95	1.10	1.80	18.00	440	1005	1.40	4x0.80	1.40	20.00	515	1080
120	1.20	1.80	19.90	530	1245	1.50	4x0.80	1.40	21.50	610	1330
150	1.40	2.00	22.20	650	1535	1.70	4x0.80	1.40	23.50	715	1605
185	1.60	2.00	24.30	790	1890	1.90	4x0.80	1.40	25.50	865	1965
240	1.70	2.00	26.50	985	2415	2.00	4x0.80	1.40	28.50	1070	2505
300	1.80	2.00	29.50	1180	2995	2.10	4x0.80	1.56	31.00	1300	3115
400	2.00	2.20	33.00	1495	3835	2.40	4x0.80	1.56	35.00	1610	3945
500	2.20	2.20	36.50	1860	4845	2.60	4x0.80	1.56	38.00	1980	4970
630	2.40	2.20	40.50	2300	6195	2.80	4x0.80	1.72	42.50	2475	6360
800	2.60	2.40	46.50	2930	7890	3.10	4x0.80	1.72	47.50	3095	8055
1000	2.80	2.60	50.00	3645	9710	3.30	4x0.80	1.88	53.50	3820	9885



1.1 KV TWO CORE, ALUMINIUM / COPPER CONDUCTOR, XLPE INSULATED, ARMoured / UNARMoured, PVC SHEATHED CABLES CONFIRMING 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		Armours dimensions (wire/strip)	Minimum thickness of outer sheath	Approx. Overall diameter	Approx. weight of cable	
					AL.	Cu.				AL.	Cu.
sq.mm.	mm.	mm.	mm.	mm.	kg./km.	kg./km.	mm.	mm.	mm.	kg./km.	kg./km.
1.5	0.70	0.3	1.80	11.50	-	130	1.40	1.24	13.30	-	340
2.5	0.70	0.3	1.80	12.20	-	155	1.40	1.24	14.10	-	375
4	0.70	0.3	1.80	13.00	145	193	1.40	1.24	15.00	405	450
6	0.70	0.3	1.80	14.30	175	245	1.40	1.24	16.00	455	525
10	0.70	0.3	1.80	16.00	215	335	1.40	1.24	17.80	540	660
16	0.70	0.3	1.80	16.00	250	440	1.40	1.40	18.00	555	750
25	0.90	0.3	2.00	18.50	335	655	4x0.80	1.40	19.20	575	875
35	0.90	0.3	2.00	20.00	440	865	4x0.80	1.40	20.90	685	1110
50	1.00	0.3	2.00	22.00	545	1115	4x0.80	1.40	23.00	810	1380
70	1.10	0.3	2.00	24.80	710	1535	4x0.80	1.56	26.00	1040	1860
95	1.10	0.4	2.20	27.80	930	2070	4x0.80	1.56	28.50	1275	2425
120	1.20	0.4	2.20	30.50	1110	2555	4x0.80	1.56	31.00	1500	2945
150	1.40	0.4	2.20	32.50	1320	3107	4x0.80	1.72	33.80	1750	3540
185	1.60	0.5	2.40	36.00	1645	3970	4x0.80	1.72	37.00	2085	4310
240	1.70	0.5	2.60	40.50	2085	4975	4x0.80	1.88	41.50	2585	5475
300	1.80	0.6	2.80	43.50	2565	6220	4x0.80	2.04	44.50	3100	6770
400	2.00	0.6	3.00	49.00	3105	7915	4x0.80	2.36	50.50	3860	8580
500	2.20	0.7	3.40	54.50	4055	10085	4x0.80	2.52	55.20	4725	10755
630	2.40	0.7	3.60	61.00	5035	12895	4x0.80	2.68	62.00	5775	13635

TECHNICAL DATA - PHYSICAL

1.1 KV THREE CORE, ALUMINIUM / COPPER CONDUCTOR, XLPE INSULATED,
ARMoured / UNARMoured, PVC SHEATHED CABLES CONFIRMING 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		Armours dimensions (wire/strip)	Minimum thickness of outer sheath	Approx. Overall diameter	Approx. weight of cable	
					AL.	Cu.				AL.	Cu.
sq.mm.	mm.	mm.	mm.	mm.	kg./km.	kg./km.	mm.	mm.	mm.	kg./km.	kg./km.
1.5	0.70	0.3	1.80	12.00	-	155	1.40	1.24	13.80	-	380
2.5	0.70	0.3	1.80	13.00	-	190	1.40	1.24	14.70	-	435
4	0.70	0.3	1.80	13.80	170	245	1.40	1.24	15.60	445	520
6	0.70	0.3	1.80	15.00	210	315	1.40	1.24	17.00	505	615
10	0.70	0.3	1.80	17.00	260	440	1.40	1.24	18.50	605	790
16	0.70	0.3	1.80	18.00	335	625	4X0.80	1.24	18.50	560	850
25	0.90	0.3	2.00	21.00	480	925	4X0.80	1.40	21.20	720	1170
35	0.90	0.3	2.00	22.50	600	1235	4X0.80	1.40	23.20	890	1525
50	1.00	0.3	2.00	25.00	750	1605	4X0.80	1.40	25.80	1055	1910
70	1.10	0.4	2.20	29.50	1030	2265	4X0.80	1.56	29.50	1400	2635
95	1.10	0.4	2.20	32.00	1290	3000	4X0.80	1.56	32.20	1705	3415
120	1.20	0.4	2.20	35.20	1560	3725	4X0.80	1.56	35.50	2015	4185
150	1.40	0.5	2.40	39.00	1920	4600	4X0.80	1.72	39.50	2415	5095
185	1.60	0.5	2.60	43.00	2375	5710	4X0.80	1.88	43.50	2930	6265
240	1.70	0.6	2.80	48.50	3025	7365	4X0.80	2.04	49.00	3635	7475
300	1.80	0.6	3.00	53.20	3710	9210	4X0.80	2.20	53.50	4380	9880
400	2.00	0.7	3.20	59.50	4660	11740	4X0.80	2.52	60.50	5450	12530
500	2.20	0.7	3.60	66.50	5885	14930	4X0.80	2.68	66.50	6720	15760
630	2.40	0.7	3.80	73.50	7320	19105	4X0.80	2.84	74.00	8220	20005

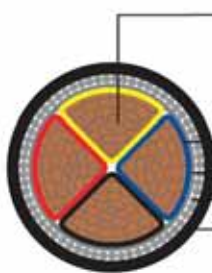
1.1 KV THREE & HALF CORE, ALUMINIUM / COPPER CONDUCTOR, XLPE INSULATED,
ARMoured / UNARMoured, PVC SHEATHED CABLES CONFIRMING TO IS:7098 (PART-1)

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		Armours dimensions (wire/strip)	Minimum thickness of outer sheath	Approx. Overall diameter	Approx. weight of cable	
					AL.	Cu.				AL.	Cu.
sq.mm.	mm.	mm.	mm.	mm.	kg./km	kg./km	mm.	mm.	mm.	kg./km	kg./km.
25	0.9/0.70	0.3	2.0	22.00	540	1080	4X0.80	1.40	23.00	805	1350
35	0.90/0.70	0.3	2.0	24.50	650	1380	4X0.80	1.40	24.90	980	1705
50	1.00/0.90	0.3	2.0	27.00	830	1835	4X0.80	1.40	27.50	1200	2265
70	1.10/0.90	0.4	2.2	31.00	1145	2590	4X0.80	1.56	31.50	1550	2995
95	1.10/1.00	0.4	2.2	34.50	1455	3450	4X0.80	1.56	35.00	1925	3920
120	1.20/1.10	0.4	2.2	38.00	1795	4350	4X0.80	1.72	39.00	2335	4910
150	1.40/1.10	0.5	2.4	42.50	2165	5255	4X0.80	1.72	42.70	2730	5820
185	1.60/1.10	0.5	2.6	46.50	2700	6610	4X0.80	1.88	47.50	3325	7230
240	1.70/1.20	0.6	2.8	52.50	3445	8505	4X0.80	2.04	53.00	4115	9180
300	1.80/1.40	0.6	3.0	57.50	4205	10595	4X0.80	2.20	57.50	4960	11350
400	2.00/1.60	0.7	3.4	65.50	5365	13560	4X0.80	2.52	66.50	6230	14420
500	2.20/1.70	0.7	3.6	72.50	6705	17215	4X0.80	2.68	73.50	7655	18145
630	2.40/1.80	0.7	4.0	82.00	8465	22085	4X0.80	3.00	82.50	9485	23105

TECHNICAL DATA - PHYSICAL

1.1 KV FOUR CORE, ALUMINIUM / COPPER CONDUCTOR, XLPE INSULATED, HARD DRAWN ALUMINIUM ARMoured / UNARMoured, PVC SHEATHED CABLES CONFIRMING TO IS:7098 (PART-1)

Nominal cross sectional area of conductor	Nominal thickness of insulation	Minium thickness of Inner sheath	Unarmoured				Armoured				
			Nominal thickness of outer Sheath	Approx. overall Diameter	Approx. weight of cable		Armours dimensions (wire/strip)	Minimum thickness of outer sheath	Approx. overall diameter	Approx. weight of cable	
					AL.	Cu.				AL.	Cu.
sq.mm.	mm.	mm.	mm.	mm.	kg./km.	kg./km.	mm.	mm.	mm.	kg./km.	kg./km.
1.5	0.70	0.3	1.80	13.00	-	180	1.40	1.24	14.50	-	410
2.5	0.70	0.3	1.80	14.00	-	230	1.40	1.24	16.00	-	480
4	0.70	0.3	1.80	15.00	200	300	1.40	1.24	16.50	490	585
6	0.70	0.3	1.80	16.00	250	390	1.40	1.24	18.50	570	715
10	0.70	0.3	1.80	18.50	315	555	1.40	1.40	20.50	700	940
16	0.70	0.3	1.80	19.50	410	790	4x0.80	1.40	20.50	665	1045
25	0.90	0.3	2.00	23.50	595	1195	4x0.80	1.40	24.00	875	1470
35	0.90	0.3	2.00	26.00	750	1595	4x0.80	1.40	26.50	1087	1930
50	1.00	0.3	2.00	29.00	945	2085	4x0.80	1.56	30.00	1330	2470
70	1.10	0.4	2.20	33.70	1305	2955	4x0.80	1.56	34.20	1725	3375
95	1.10	0.4	2.20	36.70	1645	3930	4x0.80	1.56	37.20	2110	4395
120	1.20	0.5	2.40	41.00	2055	4945	4x0.80	1.72	41.50	2575	5465
150	1.40	0.5	2.60	45.50	2510	6080	4x0.80	1.88	45.70	3060	6635
185	1.60	0.5	2.80	50.00	3105	7555	4x0.80	2.04	51.00	3735	8185
240	1.70	0.6	3.00	56.50	3960	9745	4x0.80	2.20	57.00	4665	10450
300	1.80	0.7	3.20	63.00	4890	12225	4x0.80	2.36	63.50	5670	13005
400	2.00	0.7	3.60	70.50	6170	15615	4x0.80	2.68	71.00	7010	16450
500	2.20	0.7	3.80	79.00	7730	19790	4x0.80	2.84	79.50	8675	20735
630	2.40	0.7	4.00	88.50	9635	25350	4x0.80	3.00	88.50	10685	26400



1. Conductor Material : Aluminium / Copper as per Class-2 of IS: 8130.
Shape of Conductor : For Al'm Cond.: - 4, 6 & 10 Sq.mm Solid / Stranded Non Compacted Circular, 16 Sq.mm and above - Stranded Compacted Circular.
For Cu Cond.: - 4 & 6 Sq.mm Solid / Stranded Non Compacted Circular, 10 Sq.mm and above-Stranded Compacted Circular.
2. Insulation Material : XLPE (Cross Linked Polyethylene).
3. Inner Sheath : PVC Type ST-2 as per IS: 5831; (Options : FR /FRLSH Type).
4. Armouring : Single Layer of Galvanized Steel Round Wire / Flat Strip.
5. Outer Sheath : PVC Type ST-2 as per IS: 5831; (Options : FR /FRLSH Type).
Colour of Outer Sheath : Black or any other Colour as per requirement.

CURRENT RATINGS

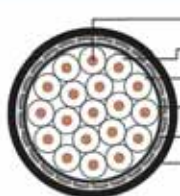
CURRENT RATINGS (A.C.) FOR 1.1KV XLPE INSULATED ALUMINIUM & COPPER CONDUCTOR POWER CABLES

Nominal area of cond.	Single Core Three Cables				Multi Core Cables			
	In Ground amp.		In Air amp.		In Ground amp.		In Air amp.	
	AL.	Cu.	AL.	Cu.	AL.	Cu.	AL.	Cu.
sq. mm								
6	45	60	40	57	43	55	40	50
10	59	80	53	77	57	74	53	67
16	76	104	73	106	78	94	70	85
25	99	130	115	145	95	120	99	125
35	117	155	140	175	116	145	117	155
50	138	185	170	215	140	175	140	190
70	168	225	210	270	170	210	176	235
95	204	265	255	330	200	250	221	290
120	230	300	300	380	225	285	258	330
150	265	335	342	430	255	315	294	375
185	295	380	385	495	285	355	339	435
240	340	435	450	590	325	410	402	510
300	390	490	519	670	370	460	461	590
400	450	550	605	780	435	520	542	670
500	500	610	700	900	481	580	624	750
630	555	680	809	1020	537	575	723	875
800	625	740	935	1140	-	-	-	-
1000	690	780	1065	1250	-	-	-	-

TECHNICAL DATA - PHYSICAL

1.1 KV MULTICORE, COPPER CONDUCTOR, XLPE INSULATED, ARMoured / UNARMoured, PVC SHEATHED
CONTROL CABLES OF SIZE: 1.5 SQ. MM. CONFIRMING TO IS: 7098 (PART-1)

No. of Cores	Insulation Thickness (Nominal)	Inner Sheath Thickness (Minimum)	Armours dimensions (wire/strip)	Outer Sheath Thickness		Approximate Overall Diameter		Approximate Net Weight of the Cable	
				Arm.	Un-Arm	Arm.	Un-Arm	Arm.	Un-Arm
No.	mm	mm	mm	mm	mm	mm	mm	kg/km	kg/km
2	0.7	0.3	1.4	1.24	1.80	12.5	11.0	340	130
3	0.7	0.3	1.4	1.24	1.80	13.0	11.5	380	155
4	0.7	0.3	1.4	1.24	1.80	14.0	12.0	410	180
5	0.7	0.3	1.4	1.24	1.80	15.0	13.0	465	210
6	0.7	0.3	1.4	1.24	1.80	16.0	14.0	515	240
7	0.7	0.3	1.4	1.24	1.80	16.0	14.0	535	255
10	0.7	0.3	1.4	1.24	1.80	19.0	17.0	690	345
12	0.7	0.3	1.4	1.24	1.80	19.5	17.5	745	385
14	0.7	0.3	1.4	1.40	1.80	20.5	18.5	830	430
16	0.7	0.3	4.0 x 0.8	1.40	1.80	20.5	19.0	735	480
19	0.7	0.3	4.0 x 0.8	1.40	2.00	21.5	20.0	820	545
24	0.7	0.3	4.0 x 0.8	1.40	2.00	24.5	23.5	990	690
27	0.7	0.3	4.0 x 0.8	1.40	2.00	25.0	24.0	1050	755
30	0.7	0.3	4.0 x 0.8	1.40	2.00	26.0	25.0	1135	820
37	0.7	0.3	4.0 x 0.8	1.40	2.00	28.0	26.5	1305	970
44	0.7	0.3	4.0 x 0.8	1.40	2.00	31.0	30.0	1515	1135
52	0.7	0.3	4.0 x 0.8	1.56	2.20	32.5	31.0	1725	1300
61	0.7	0.4	4.0 x 0.8	1.56	2.20	34.5	34.0	1970	1530



1. Conductor: Solid / Stranded Annealed Bare Copper as per Class-2 of IS: 8130; (Options : Tinned).
2. Insulation Material : XLPE (Cross Linked Polyethylene).
3. Core Identification : Upto 5 Cores - By Colour coding & above 5 Cores - By Colour Coding / Number printing on cores as per IS: 7098 Part-1.
4. Inner Sheath : PVC Type ST-2 as per IS: 5831; (Options : FR /FRLSH Type).
5. Armouring : Single Layer of Galvanized Round Wire / Flat Strip.
6. Outer Sheath : PVC Type ST-2 as per IS: 5831; (Options : FR /FRLSH Type).
Colour of Outer Sheath : Black or any other Colour as per requirement.

1.1 KV MULTICORE, COPPER CONDUCTOR, XLPE INSULATED, ARMoured / UNARMoured, PVC SHEATHED
CONTROL CABLES OF SIZE: 2.5 SQ. MM. CONFIRMING TO IS: 7098 (PART-1)

No. of Cores	Insulation Thickness (Nominal)	Inner Sheath Thickness (Minimum)	Armours dimensions (wire/strip)	Outer Sheath Thickness		Approximate Overall Diameter		Approximate Net Weight of the Cable	
				Arm.	Un-Arm	Arm.	Un-Arm	Arm.	Un-Arm
No.	mm	mm	mm	mm	mm	mm	mm	kg/km	kg/km
2	0.7	0.3	1.4	1.24	1.80	13.5	12.0	375	155
3	0.7	0.3	1.4	1.24	1.80	14.0	12.5	435	190
4	0.7	0.3	1.4	1.24	1.80	15.0	13.0	485	230
5	0.7	0.3	1.4	1.24	1.80	16.0	14.0	545	270
6	0.7	0.3	1.4	1.24	1.80	17.0	15.0	620	305
7	0.7	0.3	1.4	1.24	1.80	17.0	15.0	645	335
10	0.7	0.3	4.0 x 0.8	1.24	1.80	20.0	19.0	690	455
12	0.7	0.3	4.0 x 0.8	1.40	1.80	21.0	19.5	770	515
14	0.7	0.3	4.0 x 0.8	1.40	1.80	21.5	20.0	855	580
16	0.7	0.3	4.0 x 0.8	1.40	2.00	22.5	21.5	950	670
19	0.7	0.3	4.0 x 0.8	1.40	2.00	23.5	22.5	1040	765
24	0.7	0.3	4.0 x 0.8	1.40	2.00	27.0	26.0	1280	945
27	0.7	0.3	4.0 x 0.8	1.40	2.00	27.5	26.5	1370	1030
30	0.7	0.3	4.0 x 0.8	1.40	2.00	28.5	27.5	1485	1125
37	0.7	0.3	4.0 x 0.8	1.40	2.00	30.5	29.5	1725	1345
44	0.7	0.4	4.0 x 0.8	1.56	2.20	35.0	34.0	2065	1625
52	0.7	0.4	4.0 x 0.8	1.56	2.20	36.0	35.0	2325	1870
61	0.7	0.4	4.0 x 0.8	1.56	2.20	38.0	37.0	2625	2145

CURRENT RATING FACTORS

CURRENT RATINGS (A.C.) FOR 1.1 KV XLPE INSULATED ALUMINIUM & COPPER CONDUCTOR POWER CABLES

Nominal area of conductor	Single Core Three Cables				Multi Core Cables			
	In Ground		In Air		In Ground		In Air	
	Amp.		Amp.		Amp.		Amp.	
sq.mm.	Al.	Cu.	Al.	Cu.	Al.	Cu.	Al.	Cu.
6	45	60	40	57	43	55	40	50
10	59	80	53	77	57	74	53	67
16	76	104	73	106	78	94	70	85
25	99	130	115	145	95	120	99	125
35	117	155	140	175	116	145	117	155
50	138	185	170	215	140	170	140	190
70	168	225	210	270	170	210	176	235
95	204	265	255	330	200	250	221	290
120	230	300	300	380	225	285	258	330
150	265	335	342	430	255	315	294	375
185	295	380	385	495	285	355	339	435
240	340	435	450	590	325	410	402	510
300	390	490	519	670	370	460	461	590
400	450	550	605	780	435	520	542	670
500	500	610	700	900	481	580	624	750
630	555	680	809	1020	537	680	723	875
800	625	740	935	1140	-	-	-	-
1000	690	780	1065	1250	-	-	-	-

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

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

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

Nominal area of conductor	Value of Thermal Resistivity of Soil °C. cm/W					
sq. mm	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

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 centers (mm)				
	Touching	200	400	600	800
2	0.76	0.83	0.87	0.90	0.92
3	0.64	0.72	0.79	0.83	0.86
4	0.58	0.67	0.75	0.80	0.84
5	0.53	0.63	0.71	0.77	0.81
6	0.50	0.60	0.69	0.76	0.80
7	0.47	0.58	0.67	0.74	0.79
8	0.45	0.56	0.66	0.73	-
9	0.43	0.55	0.65	0.73	-
10	0.42	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 centers (mm)				
	Touching	200	400	600	800
2	0.81	0.85	0.89	0.91	0.93
3	0.69	0.75	0.81	0.84	0.87
4	0.64	0.69	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 centers (mm)				
	Touching	200	400	600	800
2	0.79	0.86	0.90	0.92	0.94
3	0.67	0.77	0.82	0.86	0.89
4	0.61	0.72	0.79	0.83	0.87
5	0.56	0.68	0.76	0.81	0.85
6	0.53	0.65	0.74	0.80	0.84
7	0.50	0.63	0.72	0.78	0.83
8	0.48	0.61	0.71	0.78	-
9	0.46	0.60	0.70	0.77	-
10	0.44	0.59	0.69	-	-
11	0.43	0.58	0.69	-	-
12	0.42	0.57	0.68	-	-

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

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



ELECTRICAL PARAMETER

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
	K.Amp	K.Amp	K.Amp	K.Amp	K.Amp	K.Amp
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 & COPPER CABLES FOR A.C. SYSTEM

Nominal area of conductor	Volts / Km / Amps							
	PVC Cables				XLPE Cables			
	1- PHASE		3- PHASE		1- PHASE		3- PHASE	
sq. mm	Al.	Cu.	Al.	Cu.	Al.	Cu.	Al.	Cu.
1.5	43.44	29.00	37.62	25.08	46.34	31.00	40.13	26.81
2.5	29.04	17.80	25.15	15.39	30.98	18.96	26.83	16.43
4	17.79	11.04	15.40	9.55	18.97	11.80	16.43	10.20
6	11.07	7.38	9.58	6.38	11.80	7.88	10.22	6.81
10	7.40	4.38	6.40	3.79	7.88	4.68	6.83	4.05
16	4.59	2.76	3.97	2.39	4.89	2.94	4.24	2.54
25	2.88	1.75	2.50	1.51	3.08	1.86	2.66	1.61
35	2.10	1.27	1.81	1.09	2.23	1.35	1.93	1.16
50	1.55	0.94	1.33	0.81	1.65	1.00	1.43	0.86
70	1.10	0.66	0.93	0.57	1.14	0.70	0.99	0.60
95	0.79	0.49	0.68	0.42	0.83	0.52	0.72	0.44
120	0.63	0.40	0.55	0.34	0.66	0.42	0.57	0.36
150	0.52	0.34	0.46	0.29	0.55	0.36	0.48	0.30
185	0.42	0.29	0.37	0.24	0.44	0.30	0.39	0.25
240	0.34	0.25	0.30	0.20	0.35	0.25	0.31	0.20
300	0.29	0.22	0.26	0.18	0.30	0.22	0.26	0.18
400	0.24	0.21	0.22	0.16	0.25	0.20	0.22	0.16
500	0.23	0.20	0.20	0.15	0.23	0.19	0.20	0.14
630	0.21	0.19	0.18	0.14	0.21	0.18	0.18	0.13
800	0.19	0.18	-	-	0.20	0.17	-	-
1000	0.18	0.17	-	-	0.18	0.17	-	-

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	0.128	0.144	0.090
10	0.118	0.138	0.091	0.118	0.133	0.084
16	0.110	0.128	0.085	0.108	0.122	0.080
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	0.098	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	-

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

ELECTRICAL PARAMETER

Calculated Capacitance Values of 1.1 kv cables (uF/Km)						
Nominal cross sectional area of conductor	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	uF / km	$C = \frac{\epsilon}{18 \log_e \frac{D}{d}}$	C - Capacitance ϵ - Permittivity of material D - Dia over insulation d - conductor diameter
Inductance	L	mH / km	$L = K + 0.20 \log_e \frac{2S}{d}$	K - Constant, depends on cond. construction S - conductors axil spacing d - conductor diameter
Reactance	X	ohms / km	$x = 2 \times \pi \times f \times L \times 10^{-3}$	f - frequency L - Inductance
Impedance	Z	ohms / km	$Z = \sqrt{R^2 + X^2}$	R - A.C. Resistance X - Reactance
Charging Current	Ic	amp / km	$I_c = 2 \times \pi \times f \times C \times V \times 10^{-4}$	Ic - charging current f - frequency C - Capacitance V - voltage applied
Di-electric Losses	D	w / km / phase	$D = 2 \pi f \times C \times u_o^2 \times \tan \delta \times 10^{-4}$	D - di-electric loss f - frequency C - capacitance - neutral u_o - phase voltage - neutral $\tan \delta$ - di-elect. power factor
Short Circuit for other duration	I _t	kA	$I_t = \frac{I_1}{\sqrt{t}}$	I _t - Short Circuit Current for t Sec. I ₁ - Short Circuit Current for 1 Sec. t - Duration in Seconds

Note: Max. Cond. Temp. during short circuit is 160° C for both PVC & HRPVC Cables

CURRENT RATING FACTORS FOR PVC/XLPE

RATING FACTORS FOR VARIATION IN AMBIENT AIR TEMPERATURE

Ambient Air Temperature °C	15	20	25	30	35	40	45	50	55
Rating Factors General Purpose PVC	1.40	1.32	1.25	1.16	1.09	1.00	0.90	0.80	0.69
Rating Factors Heat Resistant PVC	1.28	1.22	1.17	1.12	1.06	1.00	0.94	0.87	0.82
Rating Factors XLPE	1.22	1.18	1.14	1.10	1.04	1.00	0.95	0.89	0.84

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 Factors General Purpose PVC	1.17	1.12	1.06	1.00	0.94	0.87	0.79	0.71	0.61
Rating Factors Heat Resistant PVC	1.13	1.09	1.04	1.00	0.95	0.90	0.85	0.80	0.74
Rating Factors XLPE	1.12	1.08	1.04	1.00	0.96	0.91	0.87	0.82	0.76

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

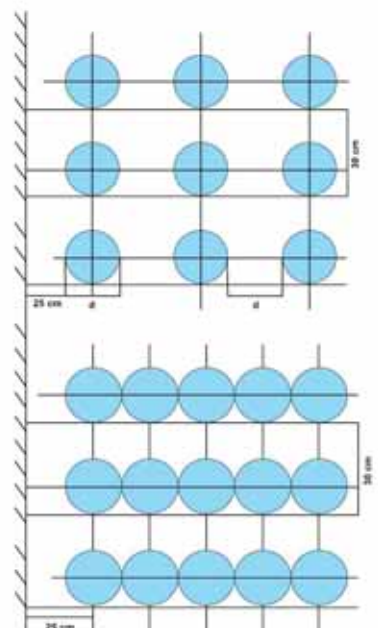
Size of Cable sq. mm.	Depth of Laying (mm)					
	750	900	1050	1200	1500	1800 & above
Upto 25 mm ²	1.00	0.99	0.98	0.97	0.96	0.95
25 mm ² - 300 mm ²	1.00	0.98	0.97	0.96	0.94	0.93
Above 300 mm ²	1.00	0.97	0.96	0.95	0.92	0.91

RATING FACTORS FOR 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



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 ¹³	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 AND TESTING

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

1. Before Laying, the insulation of the cable should be checked with megger as a preliminary check against any transit damage.
2. The drum should be always rolled in the direction of arrow for rolling, marked on the drum. In the absence of any such mark, the drum should be rolled in the direction same as that of inside end of the cable and opposite to that of the outside end.
3. Where the cable is to be joined with existing cable, the sequence of core at two ends to be joined should be in the opposite direction. i.e. if at one end is in clockwise direction, then at the other end should be in the anti clock wise direction. This is necessary to avoid the crossing of cores while jointing. This will also decide the direction in which the cable is to be pulled.
4. During Installation of XLPE/PVC insulated heavy duty cables of 1100V grade, bending radius should not be less than the following.

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

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

5. Where the cables are laid and jointed in very cold regions, both the cable and ambient temperatures should be above 0°C and have remained so far the previous 24 hours. During such conditions, the cable should also not be bending to very small radii. This is for the reason that at a very low temperature, PVC compounds become stiff and brittle, and are likely to crack and shatter when struck hard or bent to small radii.
6. A joint being the weakest point of electric power transmission system, all jointing materials and accessories like conductor ferrules, solder, insulating and protective tapes, protective filling compound, joint boxes etc., should be of right quality and sizes. A skilled jointer should be employed for making a joint and the working instructions of the supplier should be followed.
7. **Armoured Cables:** All bonding clamps at the joints and terminations and the armour wire should be thoroughly cleaned. The clamps should be adequately tightened. This is necessary to ensure proper electrical contact, because armour acts as the return path for earth fault current.

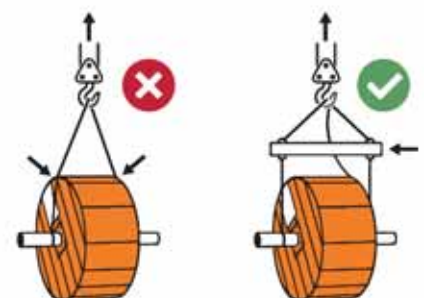
Unarmoured Cables: In case of unarmoured cables, the external metallic earth bonding connector of adequate size should be used.

8. **Earth:** All joints, terminations, armour wires and external metallic bonding should be connected to earth. 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. **Test before commissioning of a cable:** After the cable is laid but before it's 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.



INSIDE VIEW OF THE COMPANY



Core Laying



Copper Coil



Core
Rewinding



Despatch
Area



Bunching



Extruder



Raw Material
Area



Wire
Drawing



We strongly believes in:

"MAKE IN INDIA"

ZERO DEFECT & ZERO EFFECT POLICY

Zero Defect..... Safe Connections

Our manufacturing should have zero defect, so that our products should not be rejected in the global market.

Zero Effect..... Secure Connections

Our manufacturing should not have any negative impact on environment.



Rajdoot Cables Private Limited

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