

INNOVATED QUALITY ... OPTIMUM PERFORMANCE

K.flex[®]

WIRES & CABLES



AN ISO 9001 : 2000 COMPANY



Over view :

Growing industrialisation and global competition has put tremendous responsibility on Indian manufacturers to take strategic initiative in defining a new chapter regarding development of infrastructure and work culture.

The group company which is well entrench in to various cable manufacturing processes since last two decades having a sizable market-share is quick to realise this and thus decided to embark upon putting a cohesive, all under one roof manufacturing facilities.

Business Mission :

Company is being run by highly competent, dynamic and progressive management having modern outlook and which sincerely endeavors to provide its customers best value for money and performing its business mission with religious zeal.



Product Range

CONSTRUCTION	● PVC Insulated Electrical / FR/ HR Insulated Wires
	● Flame Retardant Low Smoke Wires
COMMUNICATION	● Single/Multi Core Copper Energy Cable for Wireline & Wireless Application
	● Co-Axial Cables for cable Television Networking
	● CAT 5, CAT 5 E & CAT 6 LAN Cables & Networking Components
	● Telephone & Switchboard Cables upto 5 pairs
	● Jelly Filled Telephone Cables /PCM cables
INDUSTRY	● Single & Multi Core Flexible Cables (upto 61 core)
	● Multi core shielded / PTFE/Fibre Glass/ Rubber insulated/ Compensating cables
	● Multi Core Flat Travelling Cable Upto 24 Core For Lifts, Hoists, Elevators
AUTOMOBILE	● Auto & Battery Cables / Battery Cable Assembly
AGRICULTURE	● PVC Insulated Winding Wires for Submersible Pump motors
	● 3-Core Flat Cables for Submersible Pump Motors
POWER	● LT Power Cables- PVC/XLPE Insulated Armoured /Unarmoured
	● LT Control Cables-PVC Insulated Armoured /Unarmoured

Properties and advantages of K. Flex

1. **K. Flex** cables are excellent moisture resistant, and have high dielectric strength even if the cables are immersed in water.
2. **K. Flex** cables have high short circuit-safety & overload capacity.
3. **K. Flex** cables are most suitable for easy jointing and termination.
4. **K. Flex** cables have high mechanical strength, suitable for laying on slopes and vertical shafts.
5. **K. Flex** cables are high resistant to most of chemicals, acids bases and oils.
6. **K. Flex** cables are flame retardant.
7. **K. Flex** cables have a smooth outer surface resulting in a neat appearance .
8. **K. Flex** cables have a long working life.

GENERAL CONSTRUCTION

Conductor

The conductor of power cables are normally made from electrolytic grade aluminum and for control cables high conductivity annealed copper. All conductors confirm to IS:8130-1984.

Aluminum conductors upto 10 mm² are solid circular in cross section and above 10mm² the conductors are stranded. In case of single core cables, the conductors are circular, for two core(above 10 mm²) cables they are D shape and for 3 core and 4 core cables the conductors are sector shaped. Stranded Conductors are also given below 16 mm² if required in any specific application field.

Insulation

The conductors are insulated with the high quality PVC compound confirming to IS:5831-1984. Special compounds are being continuously developed to meet customers requirements.

CORE IDENTIFICATION

Colour Scheme

Core are identified by coloured PVC insulations given as under :

Single Core : Red, Black, Yellow or Blue.

Two Core : Red and Black.

Three Core : Red, Yellow and Blue.

Four Core : Red, Yellow Blue and Black.

(For 3½ Core Reduced Neutral core colour is Black)

Five Core :Red, Yellow, Blue, Black and Gray.

Six Core & above : Two adjacent cores in each layer, Blue and Yellow, remaining cores Grey. Core numbering & different colours are also given to identified the core.

LAYING UP CORES

In twin, three and multicore cables, the cores are laid up together with a suitable lay, the outer most layer is laid up in right hand successive layers with opposite lay. The interstices are filled with non-hygroscopic material.

Inner sheath(Common Covering)

For all cables having two or more cores, a common covering is applied over the laid up cores either by extrusion of PVC compound or wrapping of plastic or proofed tapes. Single core cable do not have inner sheath.

ARMOURING

Armoring is applied over inner sheath. Where the calculated diameter below armoring does not exceed 13 mm, the armor consists of galvanized round steel wires, above the size 13mm, normally the armor is of galvanized flat steel strips.

Armoring of **K. Flex** Mining cables consists of galvanized round steel wires/strips but a few tinned copper wires/strips are also provided to meet the conductance requirements of armoring.

OUTER SHEATH

The tough outer sheath is applied by extrusion.

1. Over insulation in case of single core unarmored cables.
2. Over inner sheath in case of multi core unarmored cables.
3. Over armoring in case of armored cables.

The colour of outer sheath is normally black for best UV resistance. However, other colours can also be provided as required by the customer.

Our trade mark **K. Flex** along with voltage grade is embossed on the outer sheath In case of U.G. cables, the word ELECTRIC and in case of mining cables, the word MINING is added in embossing script.

PROPERTIES OF PVC(Electrical & Physical)

Dielectric constant - 5 to 8

Dielectric strength 30 Kv/mm (Min.)

Volume Resistivity at 27°C 1x10¹³ Ohm-cm

Tensile strength at break 12.5 N/mm² (Min.)

Elongation at break - 150% (Min.)

Continuous operating Temperature for cables 85° C for HR PVC and 70°C for general purpose PVC

CABLE CODE

The following codes are used for designation of cables :

- | | |
|----|--|
| A | Aluminum conductor (when type designation doesn't contain 'A' in the beginning then cable is with copper conductor). |
| Y | At first or second place in type designation, it stands for PVC insulation. |
| W | Steel round wire armor. |
| F | Steel strip armor |
| WW | Steel double round wire armor. |
| FF | Steel double flat strip armor. |
| Y | When last in type designation, it stands for PVC outer sheath. |

K. Flex QUALITY CONTROL SYSTEMS

1. Test at Raw Material Stage

K. Flex PVC insulated cables are manufactured from the best available raw materials, All raw materials have to undergo the strict LAB, TEST. For PVC insulated cables, the raw materials are to undergo the following Tests.

(i) Aluminium/Copperwire

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

(ii) PVC compound

Density, tensile strength, elongation at break, volume resistivity and shrinkage test.

(iii) Steel strip/wire

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

2. Production Shop Preventive Test i.e. Process Inspection

To maintain the best quality standards and to take all remedial action during the manufacturing process the following process control tests are carried out at each and every stage.

CONDUCTOR

- a) Dimensions
- b) Surface and shape of conductor
- c) Lay and direction of lay
- d) D.C. resistance
- e) No. of wires in each conductor

CORE INSULATION

- a) Dimension of cores
- b) Thickness of insulation
- c) Surface
- d) Spark test, shrinkage test and I.R. test

CORE LAYING

- a) Sequence of cores
- b) Direction of laying up and lay
- c) Circularity of cables
- d) Diameter over laid up cores
- e) Application of filler in the interstices

INNER SHEATHING

- a) Surface
- b) Concentricity
- c) Thickness
- d) Diameter over inner sheath

ARMORING

- a) Lay and direction of lay of armoring wire/strips.
- b) No. of wires/strips
- c) Uniformity of application
- d) Diameter over armoring
- e) Dimension of wires/strips

FINAL SHEATHING

- a) Thickness
- b) Concentricity
- c) Diameter over sheath
- d) Surface
- e) Embossing with required information on outer sheath

FRLS CABLES

FRLS PVC CABLES are the result of keeping pace with the latest trends in technological innovations in the field. The Specially formulated compounds meet the stringent requirements of international specification. **K. Flex** FRLS Cables range covers various specific oxygen index or corrosive gas generation or light. A typical **K. Flex** FRLS PVC sheathed cables shall give following results.

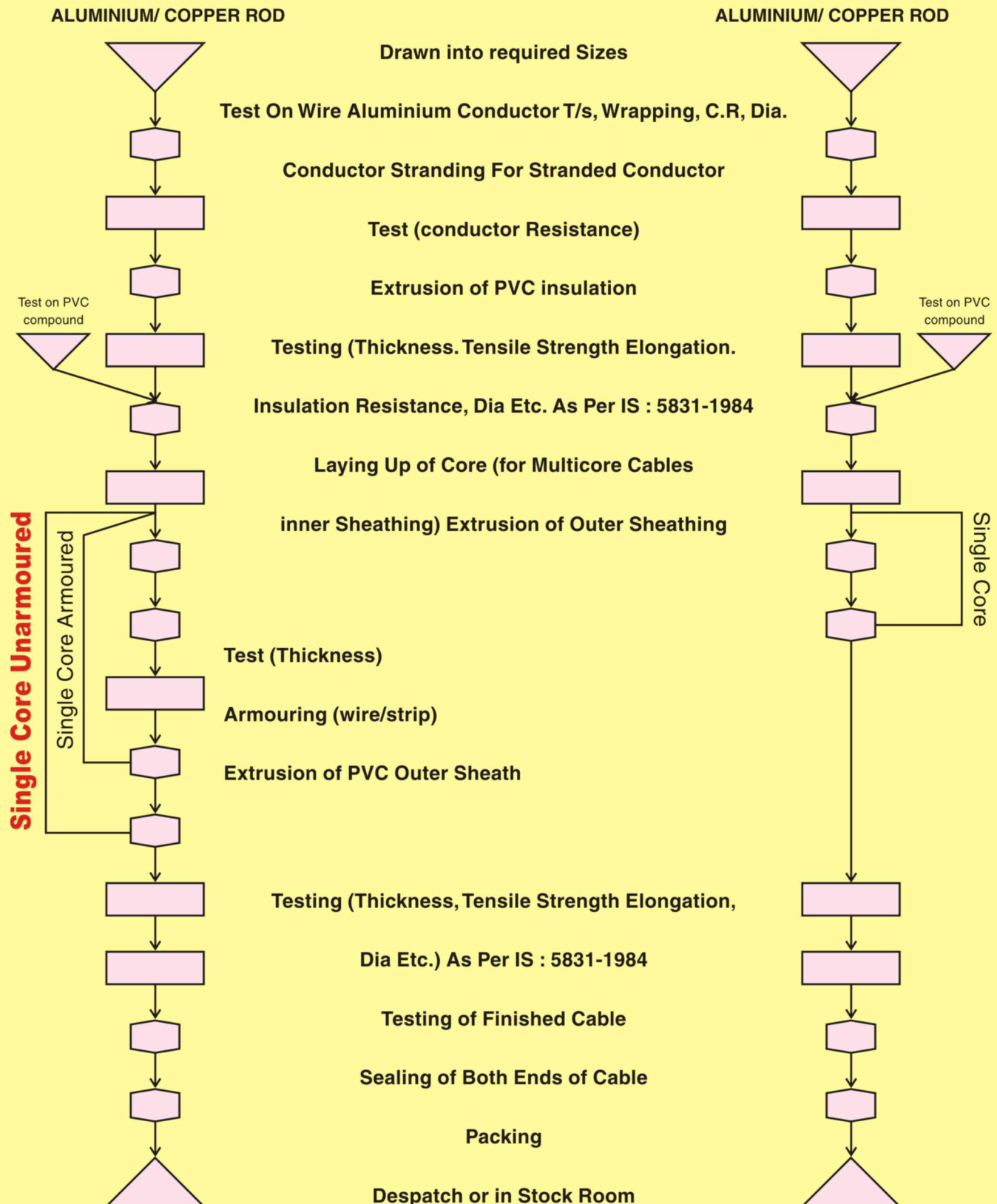
- 1. Oxygen Index-29% min.
- 2. Temperature Index-250° C min.
- 3. Smoke Density Rating-40% min.
- 4. Acid Gas Emission- 20% max.

CONTINUOUS CURRENT RATINGS

The current rating given are based on the normal conditions of installation described below :

Maximum conductor Temperature For PVC	-	70°C
For HR PVC	-	85°C
Ambient Air Temperature	-	40°C
Ground Temperature	-	30°C
Depth of Laying	-	75cm (1.1 K.V.)
(For cables laid direct in ground)	-	90cm (3.3 K.V.)
Thermal Resistivity of Soil	-	1500C cm/watt
Thermal Resistivity of PVC	-	2500C cm/watt
Type of Insulation	-	Twin and multi core cables laid singly
	-	3 single core cables laid in trefoil touching formation
	-	In Case of control cables all cores are assumed to carry full load current.
	-	For other conditions, the corresponding rating, factors are applied.

FLOW CHART FOR MANUFACTURING PROCESS & QUALITY CONTROL CHECKS FOR K-FLEX CABLES





WIRES & CABLES

K-FLEX - Flame Retardant (FR) PVC Insulated Electrical Wires

To add to the existing range of electrical wires, **K.Flex** introduces - Flame Retardant PVC insulated electrical wires, which offers added safety.

Each wire is manufactured using 99.97% pure, electrolytic grade, bright annealed bare copper with more than 100% conductivity better purity & conductivity. of copper ensures greater saving of electrical energy and thus helps to reduce electricity bills. The conductor is made of multiple strands of finely drawn copper wires thereby offering greater flexibility which makes these wires ideal for conduit wiring.

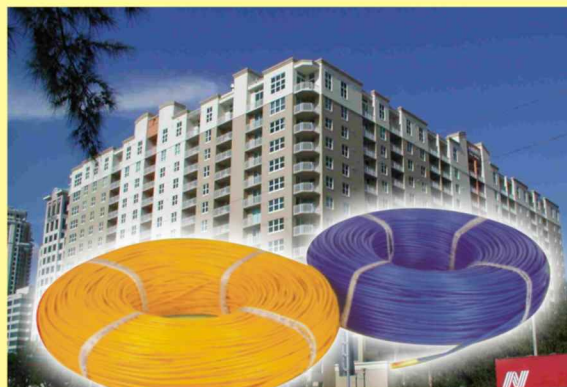
The wires are insulated with a Flame Retardant (FR) PVC compound which helps in restricting spread of fire even at very high temperatures. All wires are subjected to high voltage spark testing to make sure that there are no weak spots in the insulation. This FR PVC compound has a high oxygen and temperature index.

These wires meet the requirements of IS 694 : 1990. They additionally offer Flame Retardant (FR) properties. This means extra protection against electrical shock, short circuit and fires.

ADDITIONAL FR PROPERTIES

Test	Specification	Specified Values
Critical Oxygen Index	ASTM-D 2863	Oxygen Index Minimum 29%
Temperature Index	ASTM-D 2863 & BICC Hand Book Chapter No. 6	Minimum Temperature Index 250°C

Also meets requirements of Flammability Test as per IEC 60332-1



K-FLEX- SINGLE CORE, UNSHEATHED WIRES IN VOLTAGE GRADE 1100 V.

Nominal area of copper Conductor Sq. mm	Number / Nominal Diameter of strands mm	Thickness of insulation (Nominal) mm	Approximate Overall Diameter of wire mm	Current carrying capacity # 2 wires, single phase		Resistance (Max.) per km. @ 20°C Ohms
				In conduit / Trunking Amps.	Unenclosed -clipped directly to a surface or on cable tray Amps.	
0.75	24/.2**	0.6	2.3	6	7	26.0
1.0	14/.3*	0.7	2.7	11	12	18.10
1.5	22/.3*	0.7	3.1	16	16	12.10
2.5	36/.3*	0.8	3.7	18	22	7.41
4.0	56/.3**	0.8	4.3	24	29	4.95
6.0	84/.3**	0.8	4.8	31	37	3.30

Standard Colours : Black, Red, Blue, Yellow and green (for earthing). Supplied in 90 meter length

As per IS 3961 (Part V) - 1968

BIS licence CM/L-8174477

* As per conductor Class 2 of IS 8130 : 1984

** As per conductor Class 5 of IS 8130 " 1984

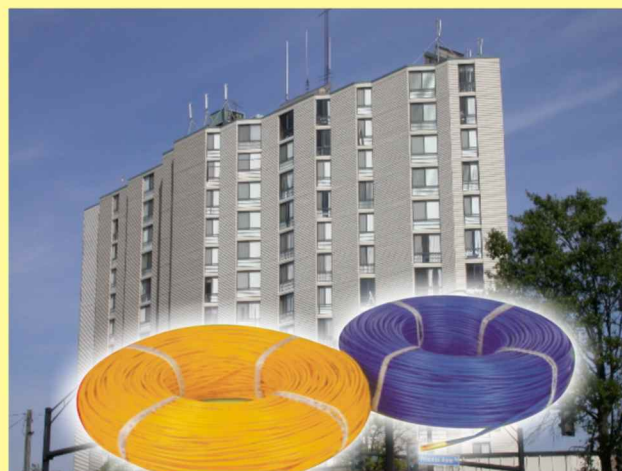
K-FLEX - 105°C Flame Retardant PVC Insulated Electrical Wires

K.Flex now introduces the unique electrical wire - 105°C Flame Retardant PVC insulated electrical wires. Due to low voltage, the current in the wire increases abnormally, thereby causing excess overheating of the wire. These wires are designed to withstand conductor temperatures upto 105°C under specific conditions. Hence, they ideally suites areas where there are wide voltage fluctuations.

These wires meet the requirements of IS 694 : 1990. They additionally meet the requirements of Heat Resistant properties and also offer Flame Retardant (FR) properties. This means extra protection against electrical shocks, short circuits and fires.

ADDITIONAL FR PROPERTIES

Test	Specification	Specified Values
Critical Oxygen Index	ASTM-D 2863	Oxygen Index Minimum 29%
Temperature Index	ASTM-D 2863 & BICC Hand Book Chapter No. 6	Minimum Temperature Index 250°C



K-FLEX - 105°C FR SINGLE CORE, UNSHEATHED WIRES IN VOLTAGE GRADE 1100 V.

Nominal area of copper Conductor Sq. mm	Number / Nominal Diameter of strands mm	Thickness of insulation (Nominal) mm	Approximate Overall Diameter of wire mm	Current carrying capacity # 2 wires, single phase		Resistance (Max.) per km. @ 20°C Ohms
				In conduit / Trunking Amps.	Unenclosed -clipped directly to a surface or on cable tray Amps.	
1.0	14/.3*	0.7	2.8	12	13	18.10
1.5	22/.3*	0.7	3.1	14	17	12.10
2.5	36/.3*	0.8	3.8	19	24	7.41
4.0	56/.3**	0.8	4.4	26	31	4.95
6.0	84/.3**	0.8	5.0	34	40	3.30

Standard Colours : Black, Red, Blue, Yellow and green (for earthing). Supplied in 90 meter length in attractive cartons.

BIS licence CM/L-8174477

* As per conductor Class 2 of IS 8130 : 1984

** As per conductor Class 5 of IS 8130 " 1984

Note Special project Packing of 200, 300, 500 mtr. are also available

K-FLEX - FLAME RETARDANT LOW SMOKE ELECTRICAL WIRES

K-Flex Flame Retardant Low Smoke (FRLS) electrical wires are manufactured by using electrolytic grade copper to ensure superior conductivity. The Cable has special flame retardant, low smoke emitting and toxic fumes suppressing properties, in addition to the properties required by IS 694 : 1990.

During a fire, ordinary PVC insulated wires give out thick black smoke and toxic fumes of hydrochloric acid gas. This impairs visibility and hampers rescue operations. on the contrary, **K-Flex** FRLS Cables not only emits very little smoke and toxic gases, but also retards the spread of fire. It is thus ideal for concealed and conduit wiring in multi-storied high rise buildings such as hotels, banks, hospitals, factories, commercial and residential complexes, etc.

FLAME RETARDANT v/s FRLS ELECTRICAL WIRES

Electrical safety is a function of five characteristics viz. smoke, hazardous gas generation, rate of heat release, flame spread and rate of burning. In case of fire in a closed space, trapped people are unable to find the exit due to emission of thick black smoke and lose consciousness due to the inhalation of toxic fumes before they can be evacuated to safety.

The advantage of low smoke and low acid gas generation are additional and critical features available with **K.Flex** FRLS wires in comparsion with FR (Flame Retardant) wires which do not provide these properties.

K-FLEX - FRLS SINGLE CORE, UNSHEATHED WIRES IN VOLTAGE GRADE 1100 V.

Nominal area of copper Conductor Sq. mm	Number / Nominal Diameter of strands mm	Thickness of insulation (Nominal) mm	Approximate Overall Diameter of wire mm	Current carrying capacity # 2 wires, single phase		Resistance (Max.) per km. @ 20°C Ohms
				In conduit / Trunking Amps.	Unenclosed -clipped directly to a surface or on cable tray Amps.	
1.0	14/.3*	0.7	2.7	11	12	18.10
1.5	22/.3*	0.7	3.1	13	16	12.10
2.5	36/.3*	0.8	3.7	18	22	7.41
4.0	56/.3**	0.8	4.3	24	29	4.95
6.0	84/.3**	0.8	4.8	31	37	3.30

Standard Base Colours : Black, Red, Blue, Yellow and green (for earthing), Supplied in 90 meter length in attractive cartons.

Conform to IS 694 : 1990.

* As per conductor Class 2 of IS 8130 : 1984

** As per conductor Class 5 of IS 8130 :1984

THE CABLE ADVANTAGE

Test	FUNCTION	SPECIFICATION	TYPICAL VALUES	
			FLAME RETARDANT	ORDINARY PVC INSULATED WIRES
Critical Oxygen Index	To determine the percentage of oxygen required for supporting combustion of insulating material at room temperature	ASTM-D 2863	More than 29%	23%
Temperature Index	To determine at what temperature normal oxygen content of 21% in air will support combustion of insulating material	ASTM-D 2863 & BICC Handbook Chapter No. 6	More than 250°C	150°C
Light Transmission (Smoke density)	To determine the visibility (Light transmission) when insulating material is on fire	ASTM-D 2843	More than 40%	10-15%
Acid Gas Generation	To ascertain the amount of Hydrochloric acid gas evolved from insulation of wire under fire	IEC 754-1	Less than 20%	45-50%

Other tests carried out are : Flammability test as per IEC 332-1

K.M Cable is a Pioneer Manufacturer of copper single core / Multi core Flexible cables . K.Flex Guarantees high quality with optimum pricing . The cable are widely used in telecom (B.T.S) Installation, wireline and wireless application, power and Automobile sectors



Each wire is fabricated using 99.97% pure, electrolytic grade, bright-annealed bare copper with more than 100% conductivity. which eventually helps in **reducing Voltage drop in Circuit** . The conductor is made of multiple strands of finely drawn copper wires thereby offering greater flexibility, which makes these wires ideal for site installation.

This FR PVC compound has a high oxygen and temperature index. The wires are wadded with a flame retardant (FR) PVC compound, which helps to control the spread of fire even at very high temperature. It also protects against electrical shock and short circuit. All wires are subjected to high voltage spark testing to ensure that no weak spots are there in the insulation.

Single core unsheathed Cables 660/1100/ Volts as Per ISI- 694-1990(DC Power/battery Cables)

PVC INSULATED BATTERY CABLES			
Conductor		Cable Parameters	
Nominal Area sq. mm	Resistance at 20°C (Max.) ohms / km	Radial Thickness of insulation (Nom.) mm.	Overall diameter (Approx.) mm.
10	1.910	1.0	6.30
16	1.210	1.0	7.25
25	0.780	1.2	8.80
35	0.554	1.2	10.35
50	0.386	1.4	12.25
70	0.272	1.4	13.90
95	0.206	1.6	15.85
120	0.161	1.6	17.75
150	0.129	1.8	18.85
185*	0.106	2.0	22.00
240*	0.0801	2.2	25.00
PVC insulated HIGH TENSION CABLES (IGNITION CABLES) in Black colour			
300	0.0601	2.40	29.50
400	0.0470	2.60	33.50
630	0.0283	2.80	42.00
1000	0.0176	3.00	48.50

Shielded Instrumentation/ Special Cable

We have expertise in manufacturing high quality Screen Shielded Instrumentation cables. These cables are Special generally manufactured with conductor sizes 0.25/0.5/0.75/1.0/1.5/2.5/4.0 sq. mm, conforming to BS: 5308 - I & II, IEC-189, IS: 1554 - I: 88, VDE 0815.

Core: From Single core/ single pair to 100core or 50 pair.

We also manufacture silicon rubber / kepton/ fiber glass Asbestos and other Kind of special Cables.

Applications:

Screen shielded instrumentation cables are used in data acquisition systems, computer networking, PAsystems, digital control / measuring & communication systems. Specially designed to transmit signals without any external interference

Range:

Conductor: Solid / Stranded / Flexible copper (bare / tinned) Insulation: PVC - HR; PE, LSZH

Shielding: individual & overall or overall screen only by Al-mylar tape / copper tape / copper wire braid

Inner sheath: PVC - HR / FR / FRLS; PE, LSZH Armor (for armored cables): Galvanized steel round wire / strip

Outer sheath: PVC - HR / FR / FRLS; PE, LSZH



COPPER CONDUCTOR PVC SHIEATHED SHIELDED WIER

CROSS SECTIONAL AREA	MM² CM	INSULATION THICKNESS IN MM	COVERAGE %	DIAMETER OF SHIELD WIRE MM.	CR AT 20°C ~ / KM ATC WIRE	SHIEATH THICKNESS MM.	OVER ALL DIA OF CABLES
0.50	2C	0.6	80	0.10	40.10	0.90	6.25
0.50	3C	0.6	80	0.10	40.10	0.90	6.30
0.50	4C	0.6	80	0.10	40.10	0.90	7.50
0.75	2C	0.6	80	0.10	26.70	0.90	7.0
0.75	3C	0.6	80	0.10	26.70	0.90	7.10
0.75	4C	0.6	80	0.10	26.70	0.90	7.25
1.0	2C	0.6	80	0.10	20.00	0.90	7.20
1.0	3C	0.6	80	0.10	20.00	0.90	7.25
1.0	4C	0.6	80	0.10	20.00	0.90	8.25
1.5	2C	0.6	80	0.10	13.70	0.90	7.40
1.5	3C	0.6	80	0.10	13.70	0.90	7.50
1.5	4C	0.6	80	0.10	13.70	0.90	8.50
1.5	5C	0.6	80	0.10	13.70	1.0	9.20
1.5	8C	0.6	80	0.10	13.70	1.10	11.25
1.5	12C	0.6	80	0.10	13.70	1.10	13.25
1.5	19C	0.6	80	0.10	13.70	1.10	16.10
1.5	24C	0.6	80	0.10	13.70	1.20	18.0
1.5	61C	0.6	80	0.10	13.70	1.25	27.20
1.5	37C	0.6	80	0.10	13.70	1.20	21.10
2.5	2C	0.7	80	0.10	8.21	0.9	8080
2.5	3C	0.7	80	0.10	8.21	0.9	8.90
2.5	4C	0.7	80	0.10	8.21	1.0	10.15
4.0	2C	0.8	85	0.10	5.09	1.0	10.60
4.0	3C	0.8	85	0.10	5.09	1.10	10.65
4.0	4C	0.8	85	0.10	5.09	1.10	12.50
6	2C	0.8	90	0.10	3.39	1.10	12.00
6	3C	0.8	90	0.10	3.39	1.10	12.10
6	4C	0.8	90	0.10	3.39	1.20	13.75
10	2C	1.0	90	0.15	1.95	1.20	16.55
10	3C	1.0	90	0.15	1.95	1.20	17.60
10	4C	1.0	90	0.15	1.95	1.30	19.70

K. FLEX TELEPHONE & SWITCHBOARD CABLES

K. Flex twisted paired cables are best suited for telephone and switchboard cabling applications. The conductor is made of solid annealed, high conductivity bare copper. The conductor is insulated with special grade high-density polyethylene different colours. The insulated cores are twisted with uniform lay to form pairs and are bunched together in such a manners so as to minimise cross talk. In 50 and 100 pair cables the units of 10 and 20 pairs respectively are identified with colour binders and stranded to form the laid up cable. The laid up cable is taped with polyester tape and further jacketed with a grey / black colour PVC with high oxygen and temperature index. The cables can be used for switchboard and internal telephone wiring in high-rise buildings, offices factories, hotels, residential complexes, etc. They generally conform to TEC specifications G/WIR-06/02 May 94.

Stringent quality control in every stage, from raw material to manufacturing upto finished product, guarantees high quality.

Salient Features :- • Low Attenuation • Low Crosstalk

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SATBVC 'N'V'L



Electrical Performance : (At 100 MHz)	
Standards	: TIE/EIA 568 B.2, UL Listed for CAT 5
Impedance	: 100 +/- - 15 ohm
(NVP) Velocity of Propagation	: 65% min. @ 100 MHz
Propagation Delay Skew	: 45 ns / 100 mtrs. @ 20 deg. C max.
DC Resistance	: 9.38 ohm / 100 mtrs. max. @ 20 deg. C max.
Mutual Capacitance	: 5.60 nF / 100 mtrs. max.

Electrical Performance : (At 100 MHz)	
Standards	: TIE/EIA 568 B.2, UL Listed for CAT 5
Impedance	: 100 +/- - 15 ohm
(NVP) Velocity of Propagation	: 65% min. @ 100 MHz
Propagation Delay Skew	: 45 ns / 100 mtrs. @ 20 deg. C max.
DC Resistance	: 9.38 ohm / 100 mtrs. max. @ 20 deg. C max.
Mutual Capacitance	: 5.60 nF / 100 mtrs. max.



Electrical Performance : (At 100 MHz)	
Standards	: TIE/EIA 568 B.2, UL Listed for CAT 5
Impedance	: 100 +/- - 15 ohm
(NVP) Velocity of Propagation	: 65% min. @ 100 MHz
Propagation Delay Skew	: 45 ns / 100 mtrs. @ 20 deg. C max.
DC Resistance	: 9.38 ohm / 100 mtrs. max. @ 20 deg. C max.
Mutual Capacitance	: 5.60 nF / 100 mtrs. max.

Electrical Performance : (At 200 MHz)	
Standards	: TIE/EIA 568 B.2, Extended to 200 MHz
Impedance	: 100 +/- - 15 ohm
(NVP) Velocity of Propagation	: 65% min. @ 20 deg. C max.
Propagation Delay Skew	: 537 ns / 100 mtrs. @ 200 MHz @ 20 deg. C max.
DC Resistance	: 9.38 ohm / 100 mtrs. max. @ 20 deg. C max.
Mutual Capacitance	: 5.60 nF / 100 mtrs. max.

Category 5e Unshielded/ Shielded Twisted Pair (UTP / STP 155 MHz) Lan Cable

Description		Core Colour	
: 4 Pair Unshielded Twisted Pair (UTP/STP) Category 5 enhanced LAN Cable		Pair 1 : White - Blue Pair 2 : White - Orange Pair 3 : White - Green Pair 4 : White - Brown	
Standard Length : 305 Meters (1000 Feet)		Sheath	
: Tangle free cable pack in laminated corrugated box		: Fire Retardant PVC Compound (FRPVC)	
Packaging		Operating Environment	
: Flame Rating		: Indoor	
Application		Approx. Cable OD : 5.0 mm	
: This Category 5E, four pair cable is a high-speed high performance, 100 ohm impedance cable capable of carrying high bit-rate signaling for extended distances in horizontal cabling. Signal amplifiers are not required for a length of 328, feet (100M). Applications can include Voice, ISDN, ATM 155 Mbps, ATM 622 Mbps, 100 Mbps TPDPI, Fast and Giga Ethernet, 100 BASE-T Mbps TP-PMMD, 1000 Base-T.		Sheath Colour	
Physical Specification :		: Grey	
Conductor : 24 AWG Annealed bare solid copper.		: 60 deg. C As per UL 1581 CMX	
Insulation : High Density Polyethylene		Physical Specification :	
: 5.60 nF / 100 mtrs. max.		Conductor : 23 AWG Annealed bare solid copper.	
: 5.60 nF / 100 mtrs. max.		Insulation : High Density Polyethylene	

Category 5e Unshielded/ Shielded Twisted Pair (UTP / STP 155 MHz) Lan Cable

Description		Core Colour	
: 4 Pair Unshielded Twisted Pair (UTP/STP) Category 6 LAN Cable		Pair 1 : White - Blue Pair 2 : White - Orange Pair 3 : White - Green Pair 4 : White - Brown	
Standard Length : 305 Meters (1000 Feet)		Sheath	
: Tangle free cable pack in laminated corrugated box		: Fire Retardant PVC Compound (FRPVC)	
Packaging		Operating Environment	
: Flame Rating		: Indoor	
Application		Approx. Cable OD : 6.5 mm	
: This Category 6, four pair cable is a high-speed high performance, 100 ohm impedance cable capable of carrying high bit-rate signaling for extended distances in horizontal cabling. Signal amplifiers are not required for a length of 328, feet (100M). Applications can include Voice, ISDN, ATM 155 Mbps, ATM 622 Mbps, 100 Mbps TPDPI, Fast and Giga Ethernet, and IEEE 802.3/5/12, 100 BASE VG, (100 BASE NE), 100 BASE-T Mbps TP-PMMD, 1000 Base-T, and any other further applications designed for Category 6 Cables.		Sheath Colour	
Physical Specification :		: Yellow	
Conductor : 23 AWG Annealed bare solid copper.		: 60 deg. C As per UL 1581 CMX	
Insulation : High Density Polyethylene		Physical Specification :	
: 5.60 nF / 100 mtrs. max.		Conductor : 23 AWG Annealed bare solid copper.	
: 5.60 nF / 100 mtrs. max.		Insulation : High Density Polyethylene	

Comparative Performance : Advantage K-FLEX

Frequency (MHz)	Attenuation (dB/100m) @ 20 deg. C	Return loss (dB) Min	NEXT (dB) Min.	PS NEXT (dB) Min.	PS EL NEXT (dB) Min.	ACR NEXT (dB) Min.
1.00	2.04	1.94	20.00	35.42	65.00	79.56
10.00	6.47	6.26	25.00	36.16	50.00	62.46
100.00	8.25	8.01	25.00	35.94	47.00	61.72
16.00	8.25	8.01	25.00	35.94	47.00	61.72
20.00	9.27	8.99	25.00	37.34	46.00	61.36
31.25	11.72	11.38	23.64	36.06	43.00	55.50
62.50	16.99	16.34	21.54	33.80	38.00	49.86
500.00	21.06	20.69	20.11	31.14	35.00	47.72

• CAT 5 Specification
• Typical Cable Performance
• Performance specification extended to frequency upto 155 MHz

Comparative Performance : Advantage K-FLEX

Frequency (MHz)	Attenuation (dB/100m) @ 20 deg. C	Return loss (dB) Min	NEXT (dB) Min.	PS NEXT (dB) Min.	PS EL NEXT (dB) Min.	PS PS NEXT (dB) Min.	ACR NEXT (dB) Min.							
1.00	2.02	1.82	20.00	45.88	74.30	88.25	72.30	79.56	67.80	74.56	64.80	72.01	72.20	86.10
4.00	3.78	3.70	23.01	45.44	65.30	68.89	63.3	77.01	55.70	65.92	52.80	63.75	61.90	82.53
8.00	5.32	5.27	24.52	45.02	60.80	76.44	58.50	70.07	46.70	61.34	46.70	58.16	58.00	71.11
10.00	5.95	5.91	25.00	44.62	29.30	75.92	57.50	68.91	47.80	59.06	44.80	56.15	53.90	29.99
16.00	7.95	7.92	25.00	39.60	26.20	74.87	54.50	61.08	43.70	58.42	40.70	57.02	46.40	67.35
20.00	8.47	8.44	25.00	39.00	24.80	66.83	52.80	65.47	41.70	55.77	38.80	54.66	47.20	63.39
31.25	9.51	9.47	24.24	38.62	53.30	67.34	51.90	64.86	49.80	56.90	37.90	60.46	34.90	55.16
62.50	10.72	10.60	23.64	38.16	47.40	63.72	45.40	53.97	31.80	60.12	28.80	56.99	33.50	48.79
100.00	19.80	19.59	20.11	41.88	44.30	60.06	42.30	52.35	27.80	61.18	24.80	56.74	26.50	42.66
1100.00	20.85	20.62	19.82	38.52	43.70	57.49	41.70	49.74	26.90	66.42	24.00	64.27	24.80	57.92
1200.00	21.96	21.60	19.55	36.26	43.10	54.63	41.10	48.66	26.20	66.24	23.20	63.70	23.40	55.98
1400.00	23.79	23.47	19.04	34.36	42.10	53.53	40.10	46.01	24.80	60.32	21.80	60.50	20.70	53.24
1710.00	26.91	26.46	18.41	32.13	40.70	49.16	38.70	44.00	22.90	63.60	19.90	58.86	18.40	25.17
2000.00	28.98	28.47	18.00	31.68	39.80	46.86	37.80	43.82	21.70	61.72	18.80	60.01	13.70	24.98
2100.00	29.79	29.24	17.85	30.92	39.50	47.65	37.50	44.84	21.30	62.92	18.40	58.46	12.70	20.21
2200.00	30.57	29.99	17.70	28.88	39.20	46.31	37.20	43.86	22.50	61.55	18.00	47.31	11.70	20.20
2300.00	31.34	30.76	17.28	28.22	38.90	45.96	36.80	43.06	22.90	60.55	17.60	47.44	10.70	18.53
2400.00	32.10	31.46	17.46	26.76	39.60	45.02	36.60	42.82	21.10	61.80	17.20	47.32	9.70	16.66
2500.00	32.95	32.17	17.22	25.49	38.30	44.12	36.30	41.92	19.80	61.11	16.80	46.61	8.80	15.72

• CAT 6 Specification
• Typical Cable Performance
• Performance specification extended to frequency upto 350 MHz

Coaxial / R.F Cable

In coaxial cable the transmission circuit is formed by three functional elements (Inner conductor, Di- electric & Outer conductor) . All three elements are concentric. The materials and dimensions of these three elements determine the transmission and the other electrical characteristics of the coaxial cable. These coaxial cables are available in 50,75,93, 125 & 150 Ohms Impedance.

It is used to transmit RF single between the transmission equipment and the antenna with 75 ohm Impedance with 50 Ohm Impedance performance in all environmental conditions

PARAMETERS	RG 8	RG 213
A. CONSTRUCTION		
1. Inner Conductor	Solid Bare	Stranded Bare
	Copper	Copper
2. Nominal Conductor Diameter (mm)	2.70	2.25 (7x0.75 mm)
3. Dielectric	Foam PE	Foam PE
4. Nominal Dielectric Diameter (mm)	7.20	4.90
5. First Outer Conductor	Bonded Al Tape	Bonded Al Tape
6. Second Outer Conductor	Al Alloy Braid	Al Alloy Braid
7. Nominal Coverage (%)	90	95
8. Jacket	PVC (Black)	PVC (Black)
9. Nominal Jacket Diameter (mm)	10.30	7.40
10. Bending radius, Minimum (mm)	100	75
B. ELECTRICAL		
1. Nominal Capacitance (pf/mtr.)	78	100
2. Nominal Impedance (Ohm)	50	50
3. Nominal Velocity Ratio (%)	66	66
C. ATTENUATION (@200°)		
FREQUENCY MHz	dB/100m Max.	dB/100m Max.
50	3.40	4.00
100	4.50	7.60
400	9.25	15.85
500	9.90	---
1000	14.00	29.60

PARAMETERS	RG 6	RG 11
A. CONSTRUCTION		
1. Inner Conductor	Solid Bare	Solid Bare
	Copper	Copper
2. Nominal Diameter (mm)	1.02	1.63
3. Dielectric	Foam PE	Foam PE
4. Nominal Dielectric Diameter (mm)	4.57	7.11
5. First Outer Conductor	Bonded Al Tape	Bonded Al Tape
6. Second Outer Conductor	Al Alloy Braid	Al Alloy Braid
7. Nominal Coverage (%)	60	60
8. Jacket	PVC (Black)	PVC (Black)
9. Nominal Jacket Diameter (mm)	7.0	10.0
10. Bending radius, Minimum (mm)	65	75
B. ELECTRICAL		
1. Nominal Capacitance (pf/mtr.)	53	53
2. Nominal Impedance (Ohm)	75	75
3. Nominal Velocity Ratio (%)	85	85
C. ATTENUATION (@200°)		
FREQUENCY MHz	dB/100m Max.	dB/100m Max.
55	5.40	3.50
83	6.50	4.00
400	13.50	9.00
500	15.50	10.00
1000	22.00	15.00



Technical Specifications of RF Cables

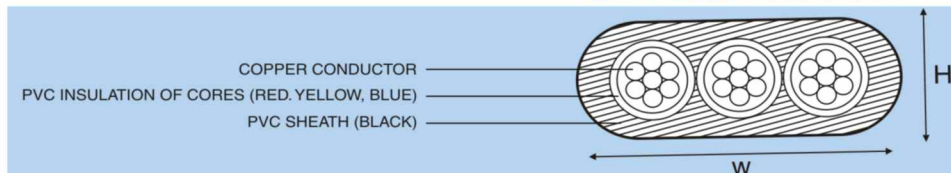
FREQUENCY MHz	1/2"		7/8"		1 1/4"		1 5/8"	
	Attenuation db/100 MTR	Power Rate KW	Attenuation db/100 MTR	Power Rate KW	Attenuation db/100 MTR	Power Rate KW	Attenuation db/100 MTR	Power Rate KW
100	2.15	3.94	1.17	8.62	0.80	12.52	0.68	17.0
200	3.08	2.75	1.69	5.99	1.19	8.84	1.10	11.0
400	4.70	1.80	2.60	3.88	1.85	5.52	1.57	6.9
800	6.35	1.33	3.56	2.83	2.57	4.03	2.19	4.84
900	6.75	1.25	3.80	2.65	2.74	3.73	2.34	4.49
1000	7.20	1.18	4.03	2.50	2.92	3.50	2.49	4.20
1500	9.05	0.95	5.08	1.99	3.70	2.80	3.17	3.22
1800	9.90	0.86	5.61	1.79	4.12	2.50	3.52	2.85
2000	10.50	0.81	6.05	1.68	4.39	2.31	3.78	2.66
2200	11.10	0.77	6.40	1.59	4.63	2.19	4.01	2.45
2400	11.60	0.75	6.75	1.54	4.88	2.08	4.28	2.33
2500	11.95	0.73	6.90	1.50	5.01	2.02	4.34	2.30

3 CORE FLAT CABLES FOR SUBMERSIBLE PUMPS

For trouble-free working, these connecting cables are just as important as winding wires are for the submersible pump motors. **K.Flex**. 3 Core Flat cables are manufactured keeping in mind the severe and difficult conditions in which they are required to perform. The individual conductors are made from bright electrolytic grade copper. The wires are drawn, annealed and bunched properly to ensure flexibility and uniform resistance. Each of the three copper conductors is insulated with a special PVC compound. The cores are laid up in flat parallel position. The outer sheath of the cable is made from a special grade of abrasion resistant PVC compound impervious to water, grease, oil, etc.

The cables are now available with sequential marking, company's name, size and voltage printed on them.

TECHNICAL DATA



3 Core Flat Cables as per IS 694:1990 with ISI mark

Conductor		Insulation	Sheath	Overall Dimension		Conductor Resistance @ 20°C (max.) ohms/km.	Current Carrying Capacity @ 40°C Amps
Area sq. mm	No. of Strands / Dia. mm	Thickness (Nom) mm	Thickness (Nom) mm	Width (Approx.) 'W' mm	Height (Approx.) 'H' mm		
1.5	22/0.30 ⁺	0.6	0.9	10.3	4.9	12.10	14
2.5	36/0.30 ⁺	0.7	1.0	12.6	5.8	7.41	18
4	56/0.30 ⁺⁺	0.8	1.0	14.8	6.6	4.95	26

Note :

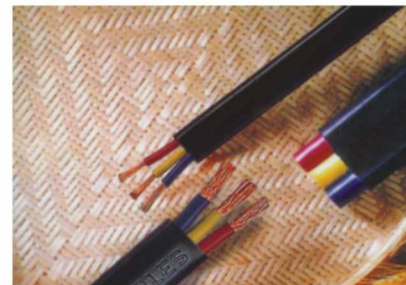
The strand diameter is nominal. However, construction of conductor is designed to satisfy the requirements of conductor resistance as per IS 8130 : 1984.

★ As per conductor Class 2 of IS 8130 : 1984.

★★ As per conductor Class 5 of IS 8130 : 1984.

3 Core Flat Cables generally conforming to IS 694:1990

Conductor		Insulation	Sheath	Overall Dimension		Conductor Resistance @ 20°C (max.) ohms/km.	Current Carrying Capacity @ 40°C Amps
Area sq. mm	No. of Strands / Dia. mm	Thickness (Nom) mm	Thickness (Nom) mm	Width (Approx.) 'W' mm	Height (Approx.) 'H' mm		
6.0	84/0.30	1.0	1.15	18.7	7.9	3.30	31
10.0	140/0.30	1.0	1.40	23.7	9.9	1.91	42
16.0	226/0.30	1.0	1.40	28.0	11.4	1.21	57
25.0	354/0.30	1.2	2.00	35.5	14.7	0.780	72
35.0	495/0.30	1.2	2.00	39.5	16.2	0.554	90
50.0	703/0.30	1.4	2.20	45.5	18.3	0.386	115
70.0	360/0.50	1.4	2.20	51.0	20.0	0.272	143
95.0	475/0.50	1.6	2.40	60.0	23.5	0.206	165



Note :

The number of wires and strand diameter will be such as to satisfy the requirements of conductor resistance as per IS 8130 : 1984

SELECTION GUIDE FOR 3 CORE FLAT CABLES

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

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

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

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



K.Flex flat travelling cables up to 24 core in different sizes viz 1mm² , 1.5 mm² are the best suited traveling cables for lifts, cable trolleys, hoists, cranes escalators etc. The cables are manufactured using a special type of compound which is blend of PVC and Synthetic Rubber. This special compound enables the cable to meet all kind of requirement as per UN Standards and ensures trouble free operations under most rugged conditions. The flat cables are weather proof cables with additional properties of U.V. protection. The cables are smoothly working from -30°C to + 50°C atmospheric temperature.

Table 1

Nominal Cross-Sectional Area mm ²	Preferred number of cores
0.75	6, 9, 12, 16, 18, 20 and 24
1	4, 5, 6, 9, 12, 16, 18, 20 and 24

Table 2

Number of Cores	6	9	12	16	18	20	24
Number of Groups X Number of Cores in Group	2X3	3X3	3X4	4X4	2X4 + 2X5	5X4	6X4
Note :- A rip- Cord may be added inside each core group							

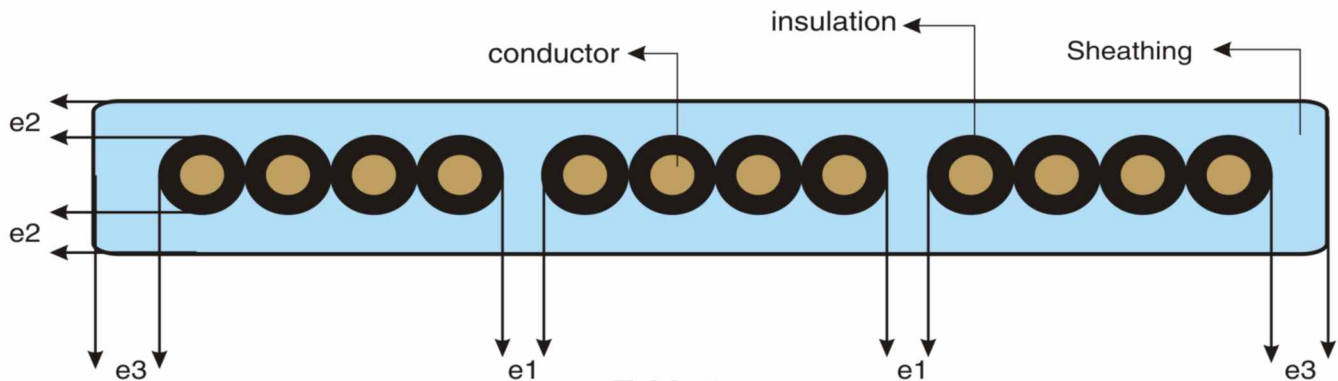


Table 3

Nominal Cross-Sectional area of conductor	Maximum Diameter of Wire in Conductor	Thickness of Insulation	Thickness of Sheathed and clearance			Minimum Insulation resistance at 70° C MΩ- km
			e1 (Min.) mm	e2 (Min.) mm	e3 (Min.) mm	
0.75	0.21	0.6	0.5	0.8	1.2	0,011
1	0.21	0.6	0.5	0.8	1.2	0,010

PVC INSULATED WINDING WIRES

K.Flex Winding Wires are insulated with a very superior grade of HR PVC compound to give it the necessary strength and resistance to abrasion.

The copper conductor of required purity and conductivity is drawn and annealed to stringent specifications. The automatic on-line controls in our extrusion process consistently give high quality **K.Flex** winding wires.

SPECIAL RANGE

K.Flex has developed a special range of winding wires with stranded copper conductor insulated with HR PVC compound for higher HP submersible pump motors. These are also manufactured to individual customer specifications. The standard range of these winding wires is given in Table

**Table - HR PVC Insulated Winding Wires generally conforming to : 8783 (Part 4/Sec 1) : 1995
(Solid Copper Conductor)**

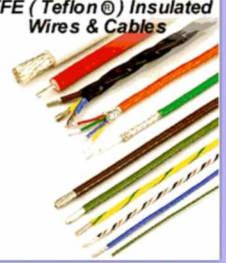
Nom. Conductor Diameter (mm.)	Nom. Cross-Sectional Area (sq. mm)	Min. Insulation Thickness (mm.)	Approx. Overall Diameter (mm.)	Max. Conductor Resistance at 20°C (Ohms/km)
0.60	0.283	0.25	1.15	62.20
0.70	0.385	0.30	1.35	45.70
0.80	0.502	0.30	1.45	35.00
0.90	0.638	0.30	1.55	27.60
1.00	0.785	0.30	1.65	22.40
1.10	0.950	0.30	1.75	18.50
1.20	1.13	0.30	1.85	15.50
1.30	1.33	0.30	1.95	13.20
1.40	1.54	0.35	2.15	11.40
1.50	1.77	0.35	2.25	9.95
1.60	2.01	0.35	2.35	8.75
1.70	2.27	0.35	2.45	7.75
1.80	2.54	0.35	2.55	6.91
1.90	2.84	0.35	2.65	6.20
2.00	3.14	0.45	2.95	5.60
2.10	3.46	0.45	3.05	5.08
2.20	3.80	0.45	3.15	4.63
2.30	4.15	0.45	3.25	4.23
2.40	4.52	0.50	3.45	3.89
2.50	4.91	0.50	3.55	3.58
2.60	5.31	0.50	3.65	3.31
2.70	5.73	0.50	3.75	3.07
2.80	6.19	0.55	3.95	2.86
3.00	7.09	0.55	4.15	2.49

Multi Standard EPR Insulated Shielded High Voltage Cable

K.Flex is one Leading Manufacturing of High Voltage Cables up to 100000 (One Lack Volt) for Special Application. These Cables are used in Cable Fault Locating Machine. The Cable is Super Flexible and most suitable for which one Normally in field

Sq. mm	KV.	No of Core	Insulation thick mm.	CR at 20Deg Ohm /Km	Shield mm.	Sheath mm.	
10/6mm	30	1	5.60	1.91/3.30	0.20	1.50	18.50
10/6mm.	50	1	6.50	1.91/3.30	0.20	1.80	19.50
10/6mm	70	1	6.50	1.91/3.30		2.20	21
10/6mm.	100	1	8.50	-	0.20	2.20	25.50

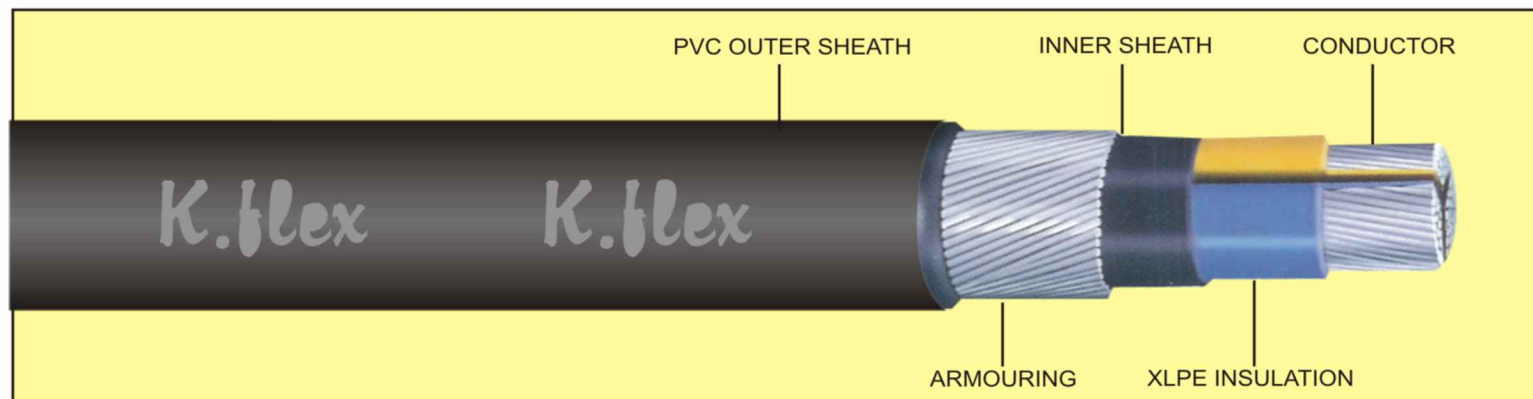
K Flex PTFE Wires, cables are tape wrapped having uniform insulation thickness around the central conductor compared to the wires insulated by extrusion process. PTFE is higher grade insulating polymer compared to other fluorocarbons that are used in extrusion process. PTFE Wires & cables have better / greater perfection.



PTFE/ TEFLON INSULATED SILVER PLATED COPPER WIRES

S.No.	Size	No. Of Strands Dia. of Strand (mm)	PARAMETERS OF CONDUCTOR (NOMINAL)			Current Rating (In Amps)		Nominal Dia. of Insulated Wire		
			Dia (mm)	Cross Section (Sq.mm)	Resistance ohm / km at 20°C	30°C	20°C	ET	E	EE
1	32/7/40	7/0.08	0.24	0.0340	570.9	2.5	6.0	0.50	0.74	1.00
2	30/1	1/0.25	0.25	0.0507	356.4	2.5	6.0	0.56	0.75	1.00
3	30/7/38	7/0.10	0.30	0.0568	323.3	2.5	6.0	0.61	0.81	1.07
4	28/1	1/0.32	0.32	0.0806	224.4	305	8.0	0.63	0.84	1.09
5	28/7/36	7/0.13	0.39	0.0887	210.5	3.5	8.0	0.69	0.89	1.14
6	26/1	1/0.40	0.40	0.1282	140.9	4.0	10.0	0.71	0.90	1.15
7	26/7/34	7/0.16	0.48	0.1409	133.7	4.0	10.0	0.79	0.99	1.24
8	26/19/38	19/0.10	0.50	0.1540	126.7	4.0	10.0	0.79	0.99	1.24
9	24/1	1/0.50	0.50	0.2047	88.4	6.0	15.0	0.81	1.00	1.25
10	24/7/32	7/0.20	0.60	0.2270	83.2	6.0	15.0	0.91	1.12	1.37
11	24/19/36	19/0.18	0.65	0.2407	80.2	6.0	15.0	0.91	1.12	1.37
12	22/1	1/0.65	0.65	0.3243	56.1	7.0	18.0	0.95	1.15	1.40
13	22/7/30	7/0.25	0.75	0.3547	52.5	7.0	18.0	1.07	1.27	1.52
14	22/7/19/34	19/0.16	0.80	0.3820	49.8	7.0	18.0	1.07	1.27	1.52
15	20/1	1/0.80	0.80	0.1568	34.7	9.0	22.0	1.10	1.30	1.53
16	20/7/28	7/0.32	0.98	0.5630	33.0	9.0	22.0	1.27	1.47	1.73
17	20/19/32	19/0.20	1.00	0.1662	30.3	9.0	22.0	1.27	1.47	1.73
18	18/7/26	7/0.40	1.20	0.8969	20.7	15.0	35.0	-	1.45	2.00
19	18/19/30	19/0.25	1.25	0.9627	19.1	15.0	35.0	-	1.75	2.00
20	16/19/29	19/0.29	1.45	1.2293	14.9	19.0	45.0	-	2.03	2.25
21	16/37/32	37/0.20	1.40	1.2000		15.0	19.0	45.0	-	2.002.20
22	15/19/28	19/0.32	1.60	1.5272		12.5	22.0	50.0	-	2.152.40
23	14/37/27	19/0.36	1.80	1.9412		9.5	25.0	60.0	-	2.422.69
24	14/37/30	37/0.25	1.75	1.8886		10.0	25.0	60.0	-	2.352.50
25	13/19/26	19/0.40	2.00	2.3864		7.8	30.0	75.0	-	2.602.85
26	12/19/25	19/0.40	2.00	2.3864		7.8	30.0	75.0	-	2.903.17
27	12/37/28	37/0.32	2.24	2.9742		6.5	35.0	90.0	-	2.853.12
28	11/19/24	19/0.50	2.50	3.7287		5.0	-	-	-	3.153.40
29	10/19/22	19/0.65	3.25	6.3015		3.0	-	-	-	3.804.10
30	10/37/26	37/0.40	2.80	4.7397		3.9	-	-	-	3.403.68

CABLE CONSTRUCTION



CONDUCTOR :

Conductors are made from EC grade high Conductivity aluminium conforming to IS 8130/1984 and are compact circular or compact sector shaped. Copper conductor cables can also be offered against specific request.

INSULATION :

K.Flex cables are specially manufactured with high dielectric grade cross-linked polyethylene for insulation and is applied by extrusion process.

CORE IDENTIFICATION :

The cores are identified by different colours :

Single core	Red, Yellow, Blue, Black
Two core	Red, Black
Three core	Red, Yellow, Blue
Four core	Red, Yellow Blue, Black
Three & half core	Red, Yellow, Blue & reduced core in black

LAYING UP :

In multicore cables, cores are laid up as per the above colour scheme.

INNER SHEATH :

Laid up cores are bedded over with thermoplastic material for protection against mechanical damage.

ARMOURING :

Armouring is provided over the inner sheath to guard against mechanical damage. Armouring is generally of galvanised steel wires or strips. In single core cables, used in AC system, armouring is by non-magnetic hard drawn aluminium wires. Round steel wires are used where the diameter over inner sheath does not exceed 13 mm, above 13 mm, flat steel strip armour is used. Round wire in different sizes can also be provided against specific request.

OUTER SHEATH :

Specially formulated heat resistant black PVC compound ST2 type as per IS 5831:1984b is extruded to form the outer sheath. **K.Flex** also offers specially formulated Flame Retardant Low Smoke (FRLS) compound on request for outer sheath used in fire hazardous environment.

TESTS

In addition to all tests required as per IS 7098 (Part I) 1988. **K.Flex** cables are subjected to a number of in-house tests at every stage of production. Incoming raw material is also tested thoroughly to ensure consistency of quality.

PRODUCT CODE :

Constituent	Code
Aluminium conductor	A
cross linked insulation	2X
Steel round wire armour	W
Steel strip armour	F
Steel double round wire armour	WW
Steel double strip armour	FF
PVC outer sheath	Y



TYPICAL EXAMPLES OF DESIGN & CONSTRUCTION OF ARMoured CABLE

IS SPECIFICATION

Power Cable
Steel strip, armoured



Conductor :
EC Grade
Aluminium

8130

Insulation :
PVC Type
A or C

5831

Inner Sheath :
PVC Type
ST 1, or ST 2

5831

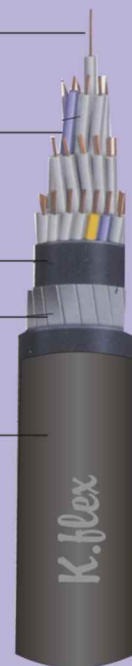
Armour :
Galvanised
Steel strip

3975

Outer Sheath :
PVC Type
ST 1 or ST 2

5831

Control Cable
Steel strip, armoured



Conductor :
High conductivity, Electrolytic
Grade Copper

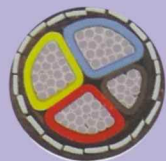
Insulation :
PVC Type
A or C

Inner Sheath :
PVC Type
ST 1, or ST 2

Armour :
Galvanised
Steel strip

Outer Sheath :
PVC Type
ST 1 or ST 2

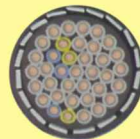
CLASSIFICATION OF PVC COMPOUND



TYPE
A
C
ST 1
ST 2

APPLICATION
Insulation
Insulation
Sheath
Sheath

Max. CONDUCTOR TEMPERATURE
70°C
85°C
70°C
90°C



CORE IDENTIFICATION

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

Single core	:	Red, Black, Yellow & Blue
2 Core	:	Red & Black
3 Core	:	Red, Yellow & Blue
3½ Core	:	Red, Yellow, Blue & reduced neutral core in Black
4 Core	:	Red, Yellow Blue & Black
5 Core	:	Red, Yellow Blue, Black & Grey

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

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

PRODUCT CODE

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

Aluminium Conductor (No abbreviations are used for copper.)	A
PVC insulation	Y
Steel round wire armour	W
Steel strip armour	F
Steel double round wire armour	WW
Steel double strip armour	FF
PVC outer sheath	Y
Al wire armour	AW

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

K.Flex has developed a special grade XLPE insulated cables (upto 1100 volts) applications. This is a thermoset type of polymer enriched with crosslinking agent. This is extruded over the conductor using modern extruders and is thoroughly crosslinked under controlled conditions. This XLPE insulation overcomes the drawbacks of PVC hitherto extensively used as an insulating material, without losing any of PVC's desirable properties

Following are the advantages of X-linked insulated cables over that of PVC insulated cables:

• **Higher Current Rating :**

Withstands continuous conductor temperature of 90°C, where as PVC withstands only 70°C, which means higher current carrying capacity.

• **Higher Overload Capacity :**

K.Flex cables can operate even at 130°C, during emergency, unlike PVC Cables which cannot operate beyond 120°C. Thus in an emergency, the entire system need not go out of commission if some of the cables fail, because the other cables in parallel can carry a higher load.

• **Higher Short Circuit Rating :**

Can withstand conductor temperatures of upto 250°C during a short circuit-PVC cannot withstand more than 160°C.

• **Lighter in Weight, Smaller Bending Radius :**

Lighter weight, smaller bending radius than PVC enables installation of **K.Flex** cables even in cramped space conditions. The cables require less support, thus lowering installation cost.

• **Lower Di-electric Constant & Power Factor :**

Results in saving in power losses which means saving in costs, particularly for higher voltage.

• **Better Impact, Abrasion, Corrosion Resistance :**

Safer than PVC Cables against mechanical damage, abrasion and corrosion.

• **Easier Jointing & Termination :**

Requires no special skills or equipment for joining and termination.



COMPARISON OF PROPERTIES

		CROSS LINKED POLYETHYLENE	PVC
Dielectric Constant		2.35	6 to 8
Dielectric Strength	KV/mm	22	14
Volume Resistivity	Ohm-cm	10	10
Thermal Resistivity	°C cm/W	350	600
Power Factor at maximum conductor temperature	°C	0.008	0.1
Normal conductor operating temperature	°C	90	70
Emergency overload temperature	°C	130	120
Maximum short Circuit temperature	°C	250	160

AERIAL BUNCHED CABLES

Aerial Bunched Cable (ABC) is a very innovative concept for overhead power distribution as compared to the conventional bare conductor overhead distribution system. It is being designed, manufactured & tested as per IS: 14255 & other international specifications. It provides higher level of safety and reliability, lower power losses and ultimate system economy by reducing installation, maintenance and operative cost. This system is ideal for rural distribution and it is especially perfect for installation in difficult terrains such as hilly areas, forest areas, coastal areas etc. ABC is also considered to be ideal for power distribution in congested urban areas with narrow lanes and by-lanes. In developing urban complex, ABC is the first choice because of its flexibility



for re-routing as demanded by changes in urban development plan.

Applications

Aerial Bunched Cables are suitable for the following functions mentioned as under:

- In theft prone areas
- As replacement of bare lines in rural areas, in woods, other localities & narrow street where space is limited
- As replacement of bare lines where reliability of supply is of prime importance
- As replacement of bare lines where high degree of stability of supply voltage is of importance
- In hilly terrains where cost of erection of overhead lines or under ground cable becomes very high
- As reinforcement of existing system without increasing voltage
- For temporary supplies

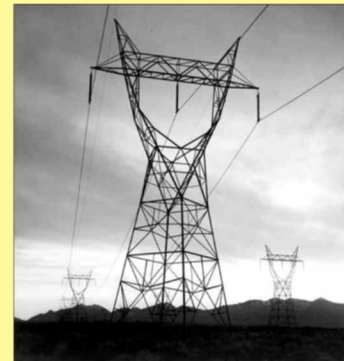
Advantages

Aerial Bunched Cables Lines have very high reliability in maintaining services because power and neutral conductors are insulated with the best dielectric. The benefits of using this line are:

- Less fault rate on account of good protection against line and ground fault by high winds or falling trees or bird especially in hilly areas & forests as encountered in rural distribution networks.
- High insulation resistance to earth in all seasons and polluted atmospheres. Negligible leakage currents and low losses.
- Multiple circuits of power and telephone cables could be strung in the same set of poles or any other supports like walls etc.
- Better adaptability to “in concurrently with existing over-head bare conductor system without any interference.
- High capacitance and low inductance leading to low impedance of lines.
- Lower voltage drop, higher current carrying capacities, vis-à-vis better voltage regulation.
- Total lines costs are reduced.
- Maintenance is very easy.

Very difficult to tap the ABC cables, thus reducing theft, which leads to lower distribution.

K M CABLES are manufactures of a wide range of conductors that includes AAC/ACSR Conductors, All Aluminum Alloy Conductors, Aluminum Conductor Aluminized Steel Reinforced (ACASR) Conductors, Aluminum Alloy Conductors Steel Reinforced (AACSR) Conductors, Other Special Conductors, as per Customer's Requirement



Special Featu

Certified IS: 398 Part-1) Certified
Approved by all Electricity Boards

Applications

AAAC: Used as bare overhead conductor for primary and secondary distribution. Designed utilizing high strength aluminum alloy to achieve a high strength-to-weight ratio; affords better sag characteristics. Aluminum alloy gives AAAC higher resistance to corrosion than ACSR.

AAC/ACSR: Used as bare overhead transmission cable and as primary and secondary distribution cable. ACSR offers optimal strength for line design. Variable steel core stranding enables desired strength to be achieved without sacrificing capacity.

AACSR: Used as bare overhead transmission cable and as primary and secondary distribution cable. AACSR offers optimal strength for line design. Variable steel core stranding enables desired strength to be achieved without sacrificing capacity.

AAC: Stranded 1350 aluminum conductors shown in this section of data are classified, as follows:

Class AA: For bare conductors usually used in overhead lines

Class A: For conductors to be covered with weather-resistant materials and for bare conductors where greater flexibility is required

Class B: For conductors to be insulated with various materials and for conductors indicated under Class A where greater flexibility is required

Class C: For conductors where greater flexibility is required

1.1 KV 1.5 Sq mm. STANDARD CONDUCTOR, PVC INSULATED ARMORED COPPER CONTROL CONFORMING TO IS: 1554(PART-92)
UNARMoured CABLES ARMoured CABLES

A2XY		Single Layer – Wire (A2XWαY)						Single Layer – Srtip (A2XFαY)					
Nominal area of	Nominal thickness of Insulation	Minimum thickness of Inner sheath	Nominal thickness of Outer sheath	Approx thickness diameter of cable	Approx weight of cable	Nominal diameter of armor wire	Minimum thickness of outer sheath	Approx overall diameter of cable	Approx weight of cable	Nominal diameter of armour strip	Minimum thickness of outer sheath	Approx overall diameter of cable	Approx weight of cable
	mm.	mm.	mm.	Kg/Km	mm.	mm.	mm.	mm.	Kg/km	mm.	mm.	mm.	Kg/Km
2	0.8	0.3	1.8	12	180	1.4	1.24	14	420	-	-	-	-
3	0.8	0.3	1.8	13	210	1.4	1.24	14.5	450	-	-	-	-
4	0.8	0.3	1.8	14	250	1.4	1.24	15	500	-	-	-	-
5	0.8	0.3	1.8	14	270	1.4	1.24	16	550	-	-	-	-
6	0.8	0.3	1.8	15	300	1.4	1.24	17	600	-	-	-	-
7	0.8	0.3	1.8	15	320	1.4	1.24	17	630	-	-	-	-
8	0.8	0.3	1.8	16	370	1.4	1.24	18	700	--	-	-	-
9	0.8	0.3	1.8	17	400	1.4	1.24	20	750	-	-	-	-
10	0.8	0.3	1.8	19	450	1.4	1.4	21	845	-	-1.24	-	-
12	0.8	0.3	1.8	20	500	1.6	1.4	22	970	0.80	1.40	20	745
14	0.8	0.3	1.8	20	600	1.6	1.4	23	1050	0.80	1.40	21	820
16	0.8	0.3	1.8	21	700	1.6	1.4	24	1100	0.80	1.40	22	900
19	0.8	0.3	2.0	23	900	1.6	1.4	25	1250	0.80	1.40	23	1000
24	0.8	0.3	2.0	26	950	1.6	1.4	28	1500	0.80	1.40	27	1200
27	0.8	0.3	2.0	27	1050	1.6	1.4	29	1600	0.80	1.40	27	1300
30	0.8	0.3	2.0	28	1240	1.6	1.4	30	1700	0.80	1.40	28	1400
37	0.8	0.3	2.0	29	1300	1.6	1.56	32	1950	0.80	1.40	30	1600
40	0.8	0.3	2.0	30	1450	1.6	1.56	33	2100	0.80	1.56	31	1750
44	0.8	0.3	2.0	33	1700	2.0	1.56	35	2300	0.80	1.56	34	1900
52	0.8	0.4	2.0	35	1950	2.0	1.56	38	2800	0.80	1.56	35	2150
61	0.8	0.4	2.2	37		2.2	1.56	40	3100	0.8	1.56	37	2400

1.1 KV 3½ CORE ALUMINUM CONDUCTOR, PVC INSULATED ARMORED ALUMINUM CABLES CONFORMING TO IS: 1554 (PART-1)
UNARMoured CABLES ARMoured CABLES

A2XY		Single Layer – Wire (A2XWαY)						Single Layer – Srtip (A2XFαY)					
Nominal area of Conductor	Nominal thickness of Insulation Main/ Neutral	Minimum thickness of Inner sheath	Nominal thickness of Outer sheath	Approx weight of cable	Approx weight of cable	Nominal diameter of armor wire	Minimum thickness of outer sheath	Approx overall diameter of cable	Approx weight of cable	Nominal diameter of armour strip	Minimum thickness of outer sheath	Approx overall diameter of cable	Approx weight of cable
S.q	mm.	mm.	mm.	Kg/Km	mm.	mm.	mm.	mm.	Kg/km	mm.	mm.	mm.	Kg/Km
25	1.2/1.0	0.3	2.0	24.0	700	1.6	1.4	26.0	1300	0.8	1.40	24.0	1000
35	1.2/1.0	0.3	2.0	26.0	850	1.6	1.4	28.0	1450	0.8	1.40	26.0	1200
50	1.4/1.2	0.3	2.0	29.0	1050	1.6	1.56	31.0	1800	0.8	1.56	30.0	1500
70	1.4/1.2	0.4	2.2	32.0	1400	2.0	1.56	36.0	2400	0.8	1.56	34.0	1800
95	1.6/1.4	0.4	2.2	36.0	1800	2.0	1.72	39.0	3000	0.8	1.56	37.0	2300
120	1.6/1.4	0.5	2.4	40.0	2200	2.0	1.88	43.0	3500	0.8	1.72	41.0	2800
150	1.8/1.4	0.5	2.4	44.0	2600	2.0	1.88	47.0	4000	0.8	1.88	45.0	3200
185	2.0/1.6	0.5	2.56	48.0	3200	2.5	2.04	53.0	5200	0.8	2.04	49.0	3900
240	2.2/1.6	0.6	3.0	54.0	4100	2.5	2.36	58.0	6400	0.8	2.20	55.0	4800
300	2.4/1.9	0.6	3.2	62.0	5000	3.15	2.52	66.0	8200	0.8	2.36	61.0	5800
400	2.6/2.0	0.6	3.4	68.0	6300	3.15	2.68	75.0	9900	0.8	2.68	69.0	7300
500	3.0/2.2	0.7	3.8	77.0	8000	4.0	3.00	84.0	13500	0.8	2.84	77.0	9000

UNARMoured CABLES ARMoured CABLES													
A2XY		Single Layer – Wire (A2XWαY)						Single Layer – Srtip (A2XFαY)					
Nominal area of Conductor or	Nominal thickness of Insulation α	Minimum thickness of Inner sheath	Nominal thickness of Outer sheath	Approx diameter of cable	Approx weight of cable	Nominal diameter of armor wire	Minimum thickness of outer sheath	Approx overall diameter of cable	Approx weight of cable	Nominal diameter of armour strip	Minimum thickness of outer sheath	Approx overall diameter of cable	Approx weight of cable
S.q	mm.	mm.	mm.	Kg/Km	mm.	mm.	mm.	mm.	Kg/km	mm.	mm.	mm.	Kg/Km
6	0.7	0.3	1.8	16.0	330	1.40	1.24	18.5	650	-	-	-	-
10	0.7	0.3	1.8	18.5	400	1.40	1.24	20.0	750	-	-	-	-
16	0.7	0.3	1.8	18.0	400	1.60	1.40	20.5	800	0.8	1.24	19.0	590
25	0.9	0.3	2.0	21.0	530	1.60	1.40	23.0	1000	0.8	1.40	21.0	800
35	0.9	0.3	2.0	22.0	640	1.60	1.40	25.0	1200	0.8	1.40	23.0	950
50	1.0	0.3	2.0	25.0	800	1.60	1.56	29.0	1450	0.8	1.40	26.0	1100
70	1.1	0.4	2.0	30.0	1100	2.0	1.56	32.0	2000	0.8	1.56	29.0	1450
95	1.1	0.4	2.2	32.0	1350	2.0	1.56	35.0	2350	0.8	1.56	32.0	1750
120	1.2	0.4	2.2	35.0	1650	2.0	1.72	39.0	2750	0.8	1.56	35.0	2100
150	1.4	0.5	2.4	39.0	2050	2.0	1.88	43.0	3250	0.8	1.72	40.0	2500
185	1.6	0.5	2.6	43.0	2500	2.5	2.04	48.0	4200	0.8	1.88	44.0	3000
240	1.7	0.6	2.8	49.0	3100	2.5	2.20	53.0	5100	0.8	2.04	50.0	3750
300	1.8	0.6	3.0	53.0	3850	2.5	2.36	58.0	6000	0.8	2.20	54.0	4500
400	2.0	0.7	3.2	59.0	4850	3.15	2.68	65.0	7950	0.8	2.52	60.0	5650
500	2.2	0.7	3.6	66.0	6100	3.15	2.84	72.0	9500	0.8	2.68	66.0	6900
630	2.4	0.7	3.8	73.0	7650	4.0	3.00	81.0	12600	0.8	2.84	74.0	8550

UNARMoured CABLES ARMoured CABLES													
A2XY		Single Layer – Wire (A2XWαY)						Single Layer – Srtip (A2XFαY)					
Nominal area of Conductor	Nominal thickness of Insulation Main/ Neutral	Minimum thickness of Inner sheath	Nominal thickness of Outer sheath	Approx weight of cable	Approx weight of cable	Nominal diameter of armor wire	Minimum thickness of outer sheath	Approx overall diameter of cable	Approx weight of cable	Nominal diameter of armour strip	Minimum thickness of outer sheath	Approx overall diameter of cable	Approx weight of cable
S.q.mm.	mm.	mm.	mm.	Kg/Km	mm.	mm.	mm.	mm.	Kg/km	mm.	mm.	mm.	Kg/Km
25	0.9/0.7	0.3	2.0	22.0	610	1.6	1.40	25.0	1100	0.8	1.40	23.0	900
35	0.9/0.7	0.3	2.0	24.0	730	1.6	1.40	27.0	1300	0.8	1.40	25.0	1050
50	1.0/0.9	0.3	2.0	27.0	920	1.6	1.56	30.0	1600	0.8	1.40	28.0	1250
70	1.1/0.9	0.4	2.2	31.0	1250	2.0	1.56	35.0	2200	0.8	1.56	32.0	1650
95	1.1/1.0	0.4	2.2	34.0	1550	2.0	1.56	38.0	2650	0.8	1.56	35.0	2000
120	1.2/1.1	0.4	2.2	38.0	1900	2.0	1.72	42.0	3150	0.8	1.72	39.0	2450
150	1.4/1.1	0.5	2.4	43.0	2300	2.0	1.88	46.0	3650	0.8	1.72	43.0	2850
185	1.6/1.1	0.5	2.6	46.0	2850	2.5	2.04	51.0	4750	0.8	1.88	48.0	3450
240	1.7/1.2	0.6	2.8	52.0	3600	2.5	2.20	56.0	5750	0.8	2.04	53.0	4300
300	1.8/1.4	0.6	3.0	57.0	4400	2.5	2.36	60.0	6750	0.8	2.20	57.0	5100
400	2.0/1.6	0.7	3.4	65.0	5600	3.15	2.68	71.0	9000	0.8	2.52	66.0	6450
500	2.2/1.	0.7	3.6	73.0	7000	3.15	2.84	79.0	11000	0.8	2.68	74.0	7950
630	2.4/1.8	0.7	4.0	82.0	8900	4.0	3.00	88.0	14500	0.8	3.00	82.0	9900

CHARACTERISTICS OF CONDUCTORS AND CORES LT AERIAL BUNCHED CABLES AS PER NFC 33-2099

Designation		Conductor					Average Thickness of Insulating Sheath Specified Min	Core	
	Nominal Sectional Area	No of Strands	Max. Linear Resistance At 20Deg.	Min. Conductor Dia Min.	Breaking Strength Max	Breaking Strength Max			Max.
PHASE OR NEUTRAL NON RETURN	S.q mm. 16	7	Ohm/Km 1.91	mm. 4.7	daN 190	daN 290	mm. 1.2	mm. 7	mm. 7.9
	25	7	12	6	300	450	14	8.7	9.6
	35	7	0.641	8.2	600	900	1.6	11.3	12.3
	50	7	0.641	8.2	600	900	1.6	11.3	12.3
	70	12	0.443	9.8	840	1260	1.8	13.3	14.3
NEUTRAL RETURN	54.6	7	0.63	9.2	1660	-	1.6	12.3	13

COMPOSITION AND DESIGNATION OF HT AERIAL BUNCHED CABLE AS PER REC SPECIFICATION NO. 64

Designation	Complete Bunched Cables	Approx. Total Mass Kg/ Km
	Approx. Overall Dia mm.	
6.35/11KV 3X35+70	53	1450
6.35/11KV 3X70+70	59	1900

LT AERIAL BUNCHED CABLES AS PER IS 14255-1995

PHASE CONDUCTOR ALUMINIUM STREET LIGHTING CONDUCTOR ALUMINIUM MESSENGER CONDUCTOR ALUMINIUM ALLOY

Norm. Aria	MAX. D.C CONDUCTOR RESISTANCE At 20 Deg. C	NOM. THICKNESS Of INSULATION XLPE/PF	Norm. Aria	MAX. D.C CONDUCTOR RESISTANCE At 20N DEG. C	NOM. THICKNESS OF INSULATION XLPE/ PE	Norm. Aria	MAX. D.C CONDUCTOR RESISTANCE At 20N DEG. C	Min. Breaking Load
S.q mm.	Ohms/km	mm.	S.q. mm..	Ohm/Km	mm.	S.q.mm.	Ohm/Km	KN
16	1.91	1.2	16	1.91	1.2	25	1.38	7
25	1.2	1.2	16	1.91	1.2	25	1.38	7
35	0.868	1.2	16	1.91	1.2	25	1.38	7
50	0.641	1.5	16	1.91	1.2	35	0.986	9.8
70	0.443	1.5	16	1.91	1.2	50	0.689	14
95	0.32	1.5	16	1.91	1.2	70	0.492	19.7

Aerial Bunch Cable

DESIGNATION	APPROX. OVERALL DIA.	APPROX, TOTAL MASS
	MM	KG/KM
3X16+25	19	250
3X16+16+25	19	310
3X25+25	22	330
3X25+16+25	22	390
3X35+25	24	430
3X35+16+25	24	490
3X50+35	32	580
3X50+16+35	32	640

LT AERIAL BUNDLED CONDUCTOR (ABC) POLYMERIC INSULATED AS PER BS: 7870 (PART-5) 1999

Normal Cross sectional Area of Conductor	Max. DC Resistance At 20 Deg C XLPE	Max. Average Thickness Conductor	Ultimate Tensile Strength Insulation
25	1.200	1.3	4.1
35	0.868	1.3	5.6
50	0.641	1.3	7.6
70	0.443	1.3	11.0
95	0.320	1.3	15.3
120	0.253	1.3	19.4

Product Range

CONSTRUCTION	● PVC Insulated Electrical / FR/ HR Insulated Wires
	● Flame Retardant Low Smoke Wires
COMMUNICATION	● Single/Multi Core Copper Energy Cable for Wireline & Wireless Application
	● Co-Axial Cables for cable Television Networking
	● CAT 5, CAT 5 E & CAT 6 LAN Cables & Networking Components
	● Telephone & Switchboard Cables upto 5 pairs
	● Jelly Filled Telephone Cables /PCM cables
INDUSTRY	● Single & Multi Core Flexible Cables (upto 61 core)
	● Multi core shielded / PTFE/Fibre Glass/ Rubber insulated cables
	● Multi Core Flat Travelling Cable Upto 24 Core For Lifts, Hoists, Elevators
AUTOMOBILE	● Auto & Battery Cables / Battery Cable Assembly
AGRICULTURE	● PVC Insulated Winding Wires for Submersible Pump motors
	● 3-Core Flat Cables for Submersible Pump Motors
POWER	● LT Power Cables- PVC/XLPE Insulated Armoured /Unarmoured
	● LT Control Cables-PVC Insulated Armoured /Unarmoured

K.flex®

WIRES & CABLES

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