AN ISO 9001 : 2015 COMPANY

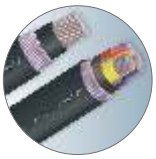
GRANDLAY

WIRES & CABLES

SINCE 1953

YOUR POWER-FULL CONNECTION

PRODUCT RANGE



LT XLPE/PVC POWER CABLES (upto 1.1 KV)

Grandlay XLPE cables with Aluminium & Copper Conductor manufactured as per IS: 7098 (Part-1) and IS: 1554 of product range, single core upto 1000 sqmm & Multi cores upto 630sqmm.

COPPER CONTROL CABLES

Grandlay control cables with Copper conductor (solid/stranded) manufactured as per IS: 1554 and IS: 7098 (Part-1) upto 100 cores.

FR/FRLS INSULATED WIRES

Flame retardant Low Smoke and FR PVC insulated ISI marked wires meet the requirement of IS: 694:2010 Single core upto 630sqmm & Multicore up to 300sqmm.

ZHFR INSULATED WIRES

Specially formulated halogen free flame retardant compound, which are composed of polymers on the basis of pure hydrocarbons are used for insulation Single core upto 630sqmm

ARIEL BUNCHED CABLES

Grandlay Ariel Bunched cables with aluminum conductor manufactured as per IS : 14255 up to 95sqmm.

SUBMERSIBLE CABLES

Submersible cables with flexible Copper conductor manufactured as per IS : 694 upto 95 sqmm.

PHOTOVOLTIAC (SOLAR) CABLES

Solar DC cables from array junction box to main junction box & MJB to inverter (as per TUV Specifications-2 Pfg 1169/08.2007)

TELEPHONE CABLES

Solid bare conductor with HDPE insulation and Flame Retardant Jacketing having lower cross talk and attenuation, from 1 pair to 100 pair X 0.40mm, 0.50 mm and 0.63 mm.

CO-AXIAL CABLES

Range-RG-59F, RG 6 F, RG 6 CCS RG 11F AND RG 11FCCS-Nitrogen Gas Injected polyethylene foam insulation, composite Al coil laminated and Al-alloy braided for low attenuation with minimum structured return loss under extreme weather conditioned to give excellent signal quality giving clear reception on higher bandwidth covering more than 100 channels.

IS: 694
IS: 1554-PT-1
IS: 7098-PT-1
CML NO : 09675508

FIA
FIRE INSURANCE APPROVED

TAC
TARIFF ADVISORY COMMITTEE

ABOUT US

The name 'Grandlay' stands for first-class manufacturing competence in wires and cables. Grandlay Wires & Cables has equipped itself with a modernized plant at Murthal Sonepat, Haryana. Grandlay has equipped itself with state of the art machinery, testing equipments run by a team of competent, high spirited technical personnel. Rapid improvements in technology related to production of wires and cables have led to meeting the highest standards of quality and better production outputs.

With the experience of manufacturing wires and cables for almost six decades, we have become one of the most reliable and trusted brands in the nation. Since its inception, Grandlay has seen an upward trend in growth because of the passion and the commitment of the founder and chairman Late Shri BL Batra. The team is now headed by Mr. Pradeep Batra (Son of Late Shri BL Batra) along with his daughter Ms. Sukriti Batra and son Mr. Hitansh Batra.

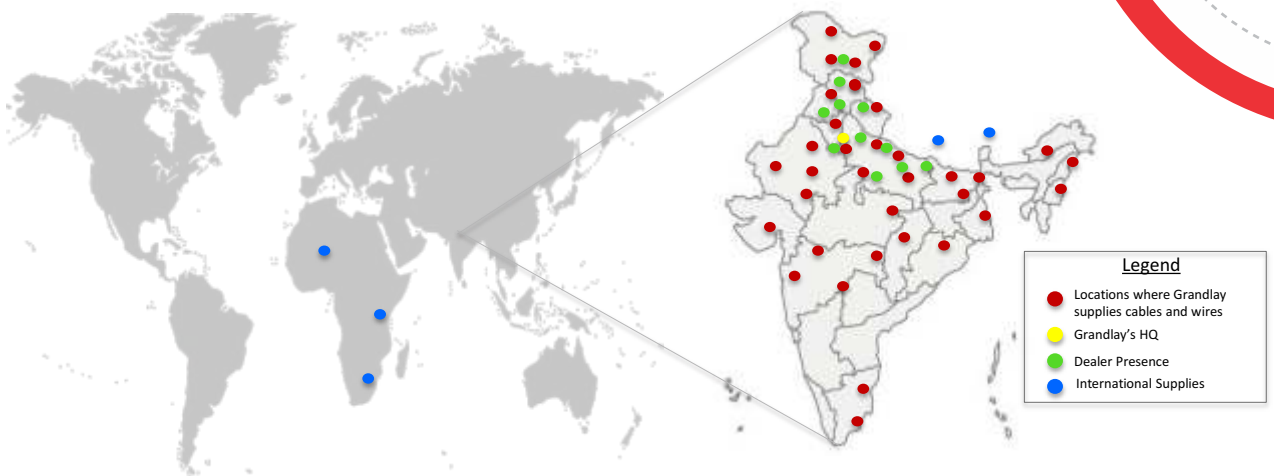
QUALITY POLICY

"Quality policy of Grandlay Electrical India is to prosper by providing cost effective quality products at competitive prices and timely delivery as per stated & implied need of our customers through strict adherence to Quality Management System.

WHY GRANDLAY

- Quality- In-house testing laboratory
- After sales customer service- prompt responses to customer queries for timely resolution; provide technical assistance, wherever required
- On-time delivery- Stock is ready in-house to meet customer demands on time. Automated production allows a shorter lead time of manufacturing cables and wires
- Machinery- completely automated production process; machines from Switzerland and Germany
- Strong distribution network- Stockists (having warehouses to house cables) and dealers to ensure timely delivery of products and meet unforeseen requests from clients

Grandlay Wires & Cable is the preferred cable brand of the India's most influential contractors, consultants, departments, utilities and developers of the infrastructure projects.



Across the highlighted geographies, Grandlay has provided cables and wires for the following purposes:

- Airports
- Water Dam's
- Commercial Buildings
- Ports
- Malls
- Housing Societies
- Wind Mills
- Paper Mills
- Steel Plant
- Sugar Mill
- Hotels

KEY CLIENTS:

DLF, L&T, DRDO, CPWD, IndianOil, igl, pwd, NBCC, vodafone, BSNL, tdi, State Bank of India, LIC, Reliance Industries Limited, Hero, Maruti Suzuki, dhampur, SAIL, Military Engineer Services, Air India, Unilever, Blue Star, airtel, RITES, Haryana Urban Development Authority, HSIIDC, Triveni Engineering & Industries Ltd.

GRANDLAY ELECTRICALS (INDIA)

Plant :
73, Industrial Estate, G.T. Road,
Murthal-131039. (Sonepat)
Haryana

Regd. Off. :
127, Nirankari Colony, Delhi-110009
Ph.: 011-27659887, 011-27659265
Toll Free : 1800 1111 90

Email : sales@grandlaycable.com website : www.grandlaycable.com

AN ISO 9001 : 2015 COMPANY

GRANDLAY WIRES & CABLES

SINCE 1953

GRANDLAY
WIRES & CABLES
SINCE 1953

LT XLPE/PVC CABLES

LT XLPE/PVC CABLES

Grandlay has an experience of manufacturing LT Cables for almost six decades, we are one of the most reliable and trusted brands in the Nation. Grandlay Wires & Cables has equipped itself with a modernized plant in Murthal, Haryana. We manufactures PVC/XLPE insulated electrical cables for working voltage upto and including 1100 volts confirming to IS:1554 / IS: 7098 (part 1).

PRODUCT RANGE:

Single Core Cables upto 1000 sq. mm
Multicore Cables upto 630 sq. mm

TECHNICAL PARAMETERS:

APPROVALS: IS: 1554 / IS: 7098 (part 1), FIA/TAC
VOLATGE GRADE: Upto 1100 KV
CONDUCTOR: Aluminium/Copper conductors confirm to IS:8130
INSULATION: XLPE insulation of power conductors specify IS:7098 (Part-1)/ PVC Insulation specify IS: 1554 (Part 1)
INNER SHEATH: PVC Tape Wrapped/ PVC extruded.
ARMOURING: Galvanized Steel - round wire/ flat strip.
OUTER SHEATH: PVC/ Flame Retardant/ Flame Retardant Low Smoke/ Zero Halogen.
DRUM LENGTHS: 500-1000 Mtrs. (Tolerance: +/- 5%)

SELECTION OF CABLES

Power Cables are generally selected considering the application. However following factors are important for selection of suitable cable construction required to transport electrical energy from one end to the other.

- Maximum operating voltage
- Insulation Level
- Load to be carried
- Possible overloading during & magnitude.
- Route length and voltage drop.
- Mode of installation environment such as ambient & ground temperature as well as chemical & physical properties of soil.
- Flame retardant properties.

The standards adopted are after duly considering the geographical/ climatically conditions and general applications of power for utilities, distribution and generation purpose.

A.C. CURRENT RATING OF ALUMINIUM CONDUCTOR CABLES INSULATED WITH XLPE, PVC (FOR COMPARISION)

Nominal area of conductor in	Single core				Multicore (3,3½ or 4 core)			
	In ground (Amps.)		In Air (Amps.)		In ground (Amps.)		In Air (Amps.)	
	XLPE	PVC	XLPE	PVC	XLPE	PVC	XLPE	PVC
10	59	51	53	47	57	46	67	40
16	76	66	73	64	78	60	70	50
25	99	86	115	84	95	76	99	70
35	117	100	140	105	116	92	117	86
50	135	120	170	130	140	110	142	105
70	166	140	210	155	170	135	179	130
95	204	175	255	190	200	165	221	155
120	230	195	300	220	225	185	258	180
150	265	220	342	250	255	210	294	205
185	295	240	385	290	285	235	339	240
240	340	270	450	335	326	275	402	280
300	390	295	519	380	370	305	461	315
400	450	325	605	435	435	335	542	375
500	550	345	700	480	481	370	624	425
630	555	390	809	550	537	405	723	480

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GRANDLAY
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SINCE 1953

AERIAL BUNCHED CABLES

YOUR POWER - FULL CONNECTION

Aerial Bunched Cables

Aerial Bunched Cables are made from Aluminium Conductor insulated by XLPE and laid together (twisted) around bare messenger wire and street light. These cables are mainly used for overhead power distribution on poles or as feeders to residential premises. ABC is ideal for rural distribution and especially attractive for installation in difficult terrains such as hilly areas, forest areas, coastal areas etc.

TECHNICAL DATA

APPROVALS: IS 14255 marked, FIA/TAC
VOLATGE GRADE: Upto 1100 Volts
CONDUCTOR: Aluminium conductors conform to IS:8130(Class-2)
Aluminum Alloy messenger wire conforms to IS:398 (Part – 4)
INSULATION: XLPE insulation of power conductors specify IS:14255:1995

CABLE DESIGN PARAMETERS

LT Aerial Bunched Cable 1100 Volts (3 Core), Reference Standard: Generally to IS : 14255-1995							
S.No.	Description	3x16 + 1x25 + 1x16 mm2	3x25 + 1x25 + 1x16 mm2	3x35 + 1x25 + 1x16 mm2	3x50 + 1x35 + 1x16 mm2	3x70 + 1x50 + 1x16 mm2	3x95 + 1x70 + 1x16 mm2
1	**Power Core**						
1.1	**Conductor**						
A)	Material	Aluminium to IS: 8130/84 Class-2					
B)	Form of Conductor	Compacted circular					
C)	Nom. Cross Sectional Area						
	i)Power Core (mm^2)	16	25	35	50	70	95
	ii) No. of Cores	3	3	3	3	3	3
D)	Max. D.C resistance at 20 °C (ohm/Km)	1.91	1.20	0.868	0.641	0.443	0.320
E)	Approx. Diameter of Conductor (mm)	5.0	6.25	7.40	8.80	10.40	12.0
1.2	**Insulation**	Cross linked Polythylene to IS : 14255-1995					
A)	Material						
B)	Colour	Black					
C)	Minimum Thickness (mm)	1.20	1.20	1.20	1.50	1.50	1.50
2	**Messenger Wire :**						
A)	Material	AAAC conductor to IS : 398					
B)	Form of Conductor	Standard circular/compacted circular					
C)	Nom. Cross sectional area (sq. mm.)	25	25	25	35	50	70
D)	Max. D.C resistance at 20 °C (ohm/Km)	1.38	1.38	1.38	0.986	0.689	0.492
E)	Appox. Diameter (mm)	6.2	6.2	6.2	7.4	8.8	10.4
F)	Insulation Material (if applicable)& Color	Cross linked Polythylene to IS : 14255-1995 Black					
G)	Min. Ins. Thickness (if applicable) (mm)	1.20	1.20	1.20	1.50	1.50	1.50
	H) Approx. breaking load (KN)	7.0	7.0	7.0	9.8	14.0	19.7
3	**Street light conductor:**						
A)	Material	(Aluminium Class -2As per IS : 8130/84)					
B)	Nom. cross sectional area (mm^2)	16	16	16	16	16	16
C)	No. of strands	7	7	7	7	7	7
D)	Overall diameter of conductor(mm)(nom.)	4.9	4.9	4.9	4.9	4.9	4.9
E)	Max. D.C. Resistance of conductor at 20^0 C (Ohm/km)	1.91	1.91	1.91	1.91	1.91	1.91
F)	Thickness of insulation (XLPE)(mm)(nom.)	1.2	1.2	1.2	1.2	1.2	1.2
4	**Identification of power cores :**	By proving ridges on the insulation.					
5	**Laying :**	Three Power Cores shall be suitably twisted arround Messenger Wire.					

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GRANDLAY WIRES & CABLES
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GRANDLAY
WIRES & CABLES

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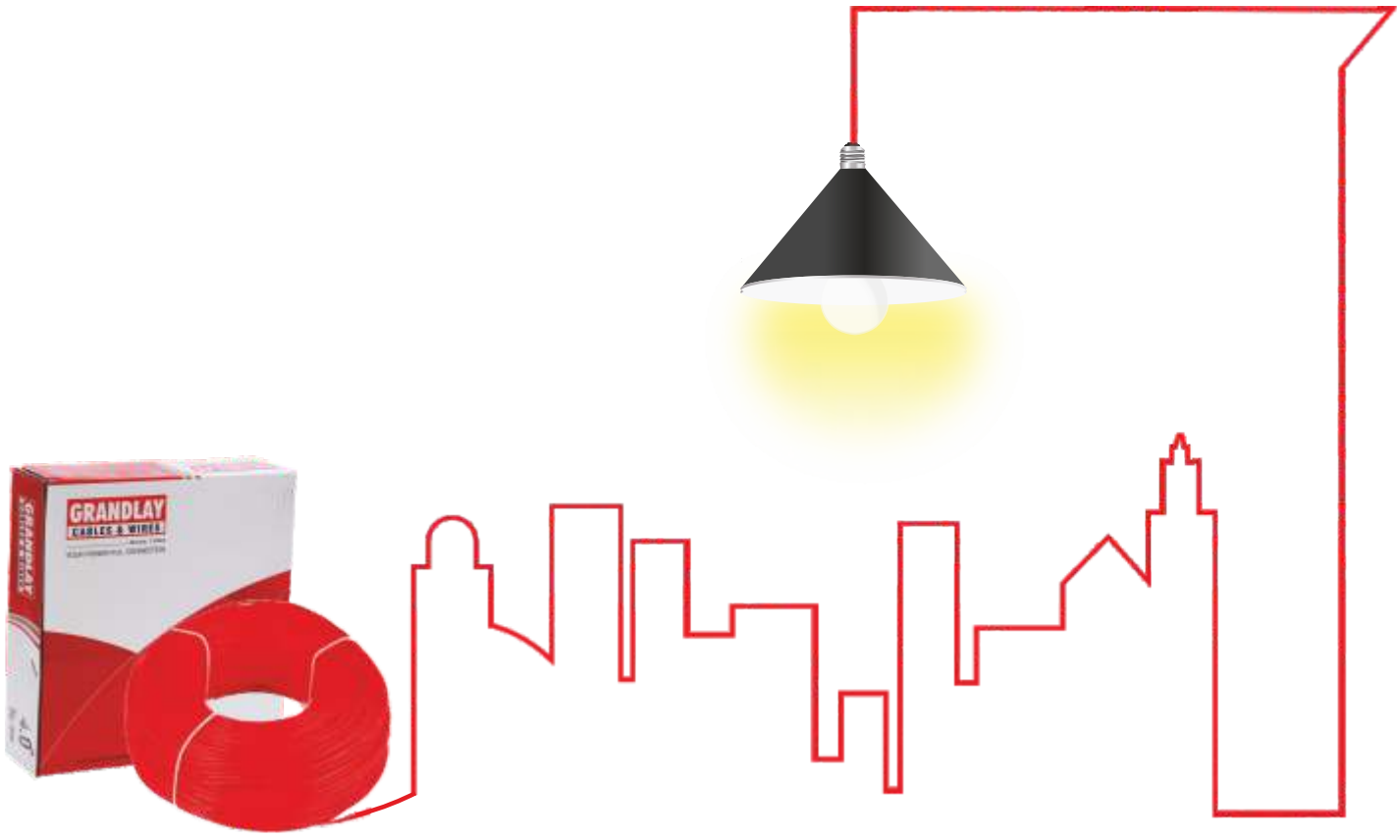
FLEXIBLE CABLE CATALOGUE



PRODUCT RANGE

LT-XLPE/PVC/POWER/CONTROL CABLES, SUBMERSIBLE CABLES, TELEPHONE/ CO-AXIAL CABLES, SOLAR CABLE, FLEXIBLE- FR/FR-LSH/ZHFR WIRES

GRANDLAY- FR

FLAME RETARDANT PVC INSULATED WIRES

GRANDLAY FR wires & cables are insulated with a FLAME RETARDANT(FR) pvc compound, specially formulated by one of our group companies to provide added safety, this fr pvc compound has a high oxygen and temperature index, these properties help in restricting the spread of fire even at very high temperatures, this special compound also offers high insulation resistance and dielectric strength.

GRANDLAY cables carriers ISI standardization mark quality certification which assures complete safety, reliability & consistency in performance, look for the company name, size, voltage grade and logo printed on the wire insulation every meter.

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

HOW WE ARE DIFFERENT THAN OTHERS

PURITY	OUR COPPER HAS MORE THAN 102% CONDUCTIVITY WHICH MEANS REDUCTION IN ELECTRICITY BILLS.
UNIFORMITY	WE HAVE THE MOST ADVANCED IN-HOUSE WIRE DRAWING, STRANDING & BUNCHING FACILITIES TO GIVE A UNIFORM LAY AND SMOOTH FINISH OF THE CONDUCTOR.
BETTER FLEXIBILITY	UNIFORM ANNEALING OF COPPER PROVIDES MORE FLEXIBILITY.
DOUBLE INSULATED	THIN COLOURED LAYER IS ONLY ON THE SURFACE FOR COLOUR IDENTIFICATION. THICK LAYER OF NATURAL VIRGIN PVC IN UNDERNEATH WHICH GIVES IMPROVED INSULATION RESISTANCE VALUE.
ECCENTRICITY	AUTOMATIC SELF-CENTERING HEAD COUPLED WITH ONLINE DIAMETER CONTROLLER MAINTAINS CONDUCTOR PERFECTLY IN THE CENTER OF PVC INSULATION WHICH PREVENT SHORT CIRCUITS OCCURRENCES DUE TO UNEVEN THICKNESS AND ECCENTRICITY OF INSULATION.
CONSISTENCY	100% WIRES PASS THROUGH SPARK TESTER TO WITHSTAND HIGH VOLTAGE STRESSES OF 9000 VOLTS TO GIVE CONSISTENT QUALITY FREE OF FOREIGN PARTICLES THROUGH OUT.
CURRENT CARRYING CAPACITY	DUE TO LOW CONDUCTOR RESISTANCE, CURRENT CARRYING CAPACITY IS MORE .

TECHNICAL DATA

NOMINAL CROSS SECTIONAL AREA OF THE CONDUCTOR	NOS. /NOMINAL DIA. OF STRAND	NOMINAL THICKNESS OF INSULATION	APPROX OVERALL DIA.	MAX. CONDUCTOR RESISTANCE	CURRENT RATING (AMPS.) 2 WIRES, SINGLE PHASE #	
SQ. MM	NO. / MM	MM	MM	Ω/KM AT 20°C	IN CONDUIT / TRUNKING	CLIPPED DIRECTLY TO SURFACE OR ON CABLE TRAY
0.75	**24/.2	0.6	2.4	26.0	7	8
1.0	*14/.3	0.7	2.7	18.1	11	12
1.5	*22/.3	0.7	3.0	12.1	13	16
2.5	*36/.3	0.8	3.7	7.41	18	22
4.0	**56/.3	0.8	4.2	4.95	24	29
6.0	**84/.3	0.8	4.8	3.30	31	37

NOTE : ■ STD. COLOURS - RED, YELLOW, BLUE, BLACK & GREEN
■ NORMAL PACKING LENGTH - 90 MTRS.

' CONDUCTOR : CLASS 2 AS PER IS:8130.1984 CONFORMS TO IS:694.2010. ISI LICENCE NO.
'' CONDUCTOR CLASS 5 AS PER IS 8130.1984 CM/L-9675508
AS PER IS : 3961 (PART V) - 1968

FR

ADDITIONAL FR PROPERTIES

TEST	SPECIFICATION	SPECIFIED VALUES
CRITICAL OXYGEN INDEX	IS:694	OXYGEN INDEX MINIMUM 29%
TEMPERATURE INDEX	IS:694	MINIMUM TEMPERATURE INDEX 250°C

GRANDLAY- (FR-LSH)
FLAME RETARDANT LOW SMOKE WIRES

The bunched conductors are insulated with specially formulated FRLS PVC compound. The compound is resistant to moisture, oil, alkali and grease and has high insulation and dielectric values. The FRLS properties with high oxygen and temperature index and low acid gas generation help in restricting propagation of flame at high temperatures.

In case of fire, the casualties occur due to suffocation and inhaling toxic fumes/gases rather than burns, moreover the dense black smoke reduce visibility, thereby making the evacuation & rescue operation nearly impossible as such the need for FRLS wires arose.

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

TECHNICAL DATA

NOMINAL CROSS SECTIONAL AREA OF THE CONDUCTOR	NOS. /NOMINAL DIA. OF STRAND	NOMINAL THICKNESS OF INSULATION	APPROX OVERALL DIA.	MAX. CONDUCTOR RESISTANCE	CURRENT RATING (AMPS.) 2 WIRES, SINGLE PHASE #	
SQ. MM	NO. / MM	MM	MM	Ω/KM AT 20°C	IN CONDUIT / TRUNKING	CLIPPED DIRECTLY TO SURFACE OR ON CABLE TRAY
0.75	**24/.2	0.6	2.4	26.0	7	8
1.0	*14/.3	0.7	2.7	18.1	11	12
1.5	*22/.3	0.7	3.1	12.1	13	16
2.5	*36/.3	0.8	3.8	7.41	18	22
4.0	**56/.3	0.8	4.3	4.95	24	29
6.0	**84/.3	0.8	4.8	3.30	31	37

NOTE : ■ STD. COLOURS - RED, YELLOW, BLUE, BLACK & GREEN
■ NORMAL PACKING LENGTH - 90 MTRS.

* CONDUCTOR : CLASS 2 AS PER IS:8130 -1984 CONFORMS TO IS:694.2010. ISI LICENCE NO. CM/L-9675508
** CONDUCTOR CLASS 5 AS PER IS 8130-1984
# AS PER IS : 3961 (PART V) - 1968

SPECIAL TESTS ON GRANDLAY WIRES

TEST	FUNCTION	SPECIFICATION	SPECIFIED VALUES	OBSD. VALUES
CRITICAL OXYGEN INDEX	TO DETERMINE PERCENTAGE OF OXYGEN REQUIRED FOR SUPPORTING COMBUSTION AT ROOM TEMPERATURE OF INSULATING MATERIAL.	IS:694	OXYGEN INDEX : MINIMUM 29%	MORE THAN 32
TEMP. INDEX	TO DETERMINE AT WHAT TEMP. NORMAL OXYGEN CONTENT OF 21% IN AIR WILL SUPPORT COMBUSTION OF INSULATING MATERIAL.	IS:694	TEMPERATURE INDEX : MINIMUM 250°C	AROUND 285°C
SMOKE DENSITY	TO DETERMINE THE VISIBILITY (LIGHT TRANSMISSION) UNDER FIRE OF INSULATING MATERIAL.	IS:694	MAXIMUM SMOKE DENSITY 60%	AROUND 50%
ACID GAS EVALUATION	TO ASCERTAIN THE AMOUNT OF HYDROCHLORIC ACID GAS EVOLVED FROM PVC INSULATION OF WIRE UNDER FIRE CONDITIONS.	IS:694	HYDROCHLORIC ACID GAS RELEASED : 20% MAX.	AROUND 15%

GRANDLAY- (ZHFR)
ZERO HALOGEN FLAME RETARDANT WIRES

Specially formulated halogen free flame retardant compound, which are composed of polymers on the basis of pure hydrocarbons are used for insulation. The insulation does not burn readily, melt or dip. The use of smoke suppressive chemicals ensures very little smoke is emitted under condition of fire. These wires are primarily used where critical control supply is essential during a fire viz. Lifts, fire alarms, high rise residential buildings, hospitals, hotels, mall, schools, etc.

SALIENT FEATURES:

- Superior flame retardant properties.
- Emit lesser amount of non corrosive smoke.
- Insulation does not burn readily.
- Ideal for wiring in closed confined spaces.
- Emit non toxic fumes.
- Moisture resistant.
- Self extinguishing.
- Low oxygen entrapment.

TECHNICAL DATA

NOMINAL CROSS SECTIONAL AREA OF THE CONDUCTOR	NOS. /NOMINAL DIA. OF STRAND	NOMINAL THICKNESS OF INSULATION	APPROX OVERALL DIA.	MAX. CONDUCTOR RESISTANCE	CURRENT RATING (AMPS.) 2 WIRES, SINGLE PHASE #	
SQ. MM	NO. / MM	MM	MM	Ω/KM AT 20°C	IN CONDUIT / TRUNKING	CLIPPED DIRECTLY TO SURFACE OR ON CABLE TRAY
1.0	*32/.20	0.7	2.7	17.50	11	12
1.5	*32/.25	0.7	3.0	13.30	13	16
2.5	*50/.25	0.8	3.7	7.98	18	22
4.0	**56/.30	0.8	4.2	4.95	24	29
6.0	**84/.30	0.8	4.8	3.30	31	37

NOTE : ■ STD. COLOURS - RED, YELLOW, BLUE, BLACK & GREEN
■ NORMAL PACKING LENGTH - 90 MTRS.

** CONDUCTOR CLASS 5 AS PER IS 8130.1984
# AS PER IS : 3961 (PART V) - 1968

SOME COMPARATIVE TECHNICAL FEATURES ARE GIVEN BELOW:

S.NO	FEATURES	FR FLAME RETARDANT	FRLS FLAME RETARDANT LOW SMOKE	ZHFR ZERO HALOGEN FLAME RETARDANT
1.	INSULATION MATERIAL	SPL. FR PVC	SPL. FR-LS PVC	SPL. POLYMER
2.	INSULATION PROPERTY	GOOD	VERY GOOD	EXCELLENT
3.	FLAME RETARDANCY	GOOD	VERY GOOD	EXCELLENT
4.	SAFETY DURING BURNING	GOOD	VERY GOOD	EXCELLENT
5.	REQUIREMENT OF CRITICAL OXYGEN INDEX AS PER ASTMD-2863 & IS 694 TO CATCH WIRE (%)	>29%	>30%	>32%
6.	RELEASE OF ACID GAS DURING BURNING (%)	NA	<18% GOOD	<1% EXCELLENT
7.	LIGHT TRANSMISSION (VISIBILITY) DURING CABLES AS PER ASTMD-2843 BURNING (%)	NA	>40% GOOD	>80% EXCELLENT

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GRANDLAY
WIRES & CABLES
SINCE 1953

3 CORE FLAT SUBMERSIBLE CABLES

AN ISO 9001 : 2015 COMPANY

GRANDLAY

WIRES & CABLES

SINCE 1953

IS: 694
IS: 1554-PT-1
IS: 7098-PT-1

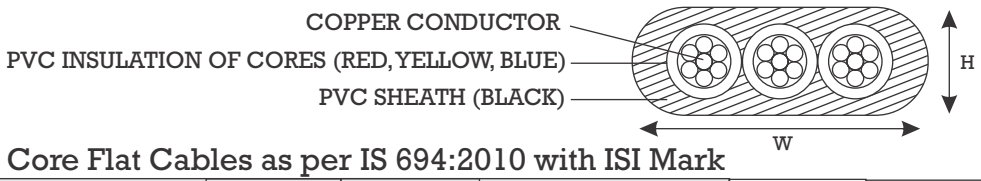
FIA TAC

3 CORE FLAT CABLES FOR SUBMERSIBLE PUMP MOTORS

Grandlay Special 3 Core Flat Cables are manufactured for critical space requirement, protection against indefinite immersion in water under specified conditions.

Grandlay Special 3 Core Flat Cables are produced from best quality electrolytic copper, which is drawn, anneled
on-line and bunched on automatic machines to ensure flexibility and uniform resistance. The conductors are insulated with a special grade of PVC and Outer Sheath consisting of highly abrasion resistant PVC compound impervious to grease, oil and water etc.

TECHNICAL DATA



3 Core Flat Cables as per IS 694:2010 with ISI Mark

Conductor		Insulation	Sheath	Overall Dimensions		Conductor Resistance @20°C (max) ohms/km.	Current Carrying Capacity @40°C Amps
Area sq.mm	No/Dia of Strands mm	Thickness (Nom) mm	Thickness (Nom) mm	Width (Approx.) 'W' mm	Height (Approx.) 'H' mm		
1.5	22/0.30*	0.6	0.9	10.30	4.9	12.10	14.
2.5	36/0.30*	0.7	1.0	12.60	5.6	7.41	18.
4.0	56/0.30**	0.8	1.0	14.80	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

3 Core Flat Industrial Grade as per IS 694:2010 with ISI Mark

Conductor		Insulation	Sheath	Overall Dimensions		Conductor Resistance @20°C (max) ohms/km.	Current Carrying Capacity @40°C Amps
Area sq.mm	No/Dia of Strands mm	Thickness (Nom) mm	Thickness (Nom) mm	Width (Approx) 'W' mm	Height (Approx) 'H' mm		
6.0	84/0.30	0.8	1.10	16.50	7.40	3.30	31
10.0	80/0.40	1.0	1.40	21.40	9.20	1.91	42
16.0	126/0.40	1.0	1.40	24.50	10.50	1.21	57
25.0	196/0.40	1.2	2.00	30.60	13.50	0.780	72
35.0	276/0.40	1.2	2.00	34.40	14.70	0.554	90
50.0	396/0.40	1.4	2.20	41.20	17.20	0.386	115
70.0	360/0.50	1.4	2.20	46.60	19.00	0.272	143
95.0	475/0.50	1.6.	2.40.	53.00	21.40	0.206	165

Special Features

- Energy efficient cables
- Increased flexibility due to uniform copper annealing
- High current capacity
- Adherence to strict quality control using latest technology

SELECTION GUIDE FOR 3 CORE FLAT CABLES

1) HP Vs Current : The full load current for submersible pump motor, 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 carrying capacity of the cable by factors given below for various ambient temperature

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

3 CORE FLAT CABLES FOR SUBMERSIBLE PUMP MOTORS

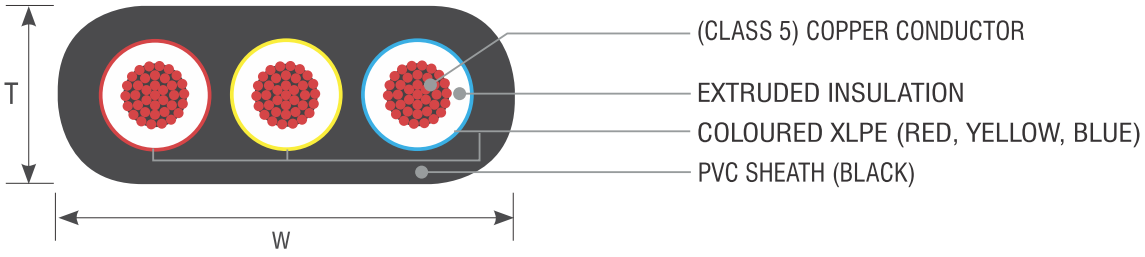
Grandlay 3 Core flat cables are manufactured for critical space requirement, protection against indefinite immersion in water under specified conditions, protection against rain-water and against ingress of small solid foreign bodies.

Grandlay 3 Core flat Cables are produced from best quality electrolytic copper, which is drawn, annealed and bunched on automatic machines to ensure flexibility and uniform resistance. The conductors are insulated with a XLPE on sophisticated extrusion lines. Outer sheath consists of highly abrasion resistant PVC compound impervious to grease, oil and water etc.

XLPE 1100 V GRADE GRANDLAY-3 CORE FLAT CABLES (GENERALLY CONFORMING TO IS: 694)

Conductor		**Insulation**	**Sheath**		Conductor Resistance @20 °C(max). Ohms/km	Current carrying capacity@ 40 °C Amps
			Overall dimensions			
Area (nom.)sq.mm	No./dia of strands mm	Thickness (nom.)mm	Thickness (nom.)mm	Size (approx.). (WxT)mm		
1.5	30/0.25	0.7	0.9	11.2x5.1	13.3	22
2.5	50/0.25	0.7	1.0	12.6x5.7	7.98	29
4.0	56/0.3	0.7	1.1	14.5x6.4	4.95	40

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



XLPE 1100 V Grade Grandlay - 3 Core Flat Cables (generally conforming to IS: 694)

Conductor		**Insulation**	**Sheath**		Conductor Resistance @20°C(max). Ohms/km	Current carrying capacity@ 40°C Amps
			Overall dimensions			
Area (nom.)sq.mm	No./dia of strands mm	Thickness (nom.)mm	Thickness (nom.)mm	Size (approx.). (WxT)mm		
6	84/0.3	0.7	1.1	16.4x7.1	3.30	51
10	80/0.4	0.7	1.2	19.3x8.1	1.91	69
16	126/0.4	0.7	1.3	22.8x9.5	1.21	87
25	196/0.4	0.9	1.5	28.1x11.5	0.78	115
35	276/0.4	0.9	1.6	31.9x13	0.554	143
50	396/0.4	1.0	1.7	37.5x14.9	0.386	180

LT-XLPE CABLES ARE SUPERIOR OVER PVC CABLES SINCE THEY

- have longer life as compared to conventional PVC Cables.
- have higher conductor temperature rating i.e 90 °C as against 70 °C of PVC and hence higher current rating.
- have higher emergency overload capacity than PVC Cables (upto 60%).
- have max. temperature limit under short circuit conditions 250 °C as against 160 °C for PVC Cables and hence have higher short circuit rating.
- have moisture resistance of nearly 100 times that of PVC.
- have very high insulation resistance compared to PVC (as high as 1000 times.)
- have high corrosion resistance in polluted atmosphere as compared to PVC Cables.
- have better properties of resistance to chemical and corrosive gases.
- have low installlation cost because of light weight, dimensions and are far more flexible.
- have better properties to withstand vibration,hot impacts.
- have easier & quicker jointing.
- and are ideal for transmission and distribution of power.

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GRANDLAY
WIRES & CABLES
SINCE 1953

SOLAR CABLES

Solar and wind energy are the energy sources of the future. Using their limitless power sustainably and cleanly for the energy consumption of mankind is the great challenge facing the energy supply of the near future. In the area of renewable energies Grandlay Solar cables have been developed with particular characteristics that can perform within the harsh conditions of solar and wind environments. Solar Cable interconnects solar panels and other electrical components in the photovoltaic system. These cables are designed to be UV resistant and weather resistant. The cables can be used indoor, outdoor, in hazard explosion areas, in industry and agriculture.

CABLE CONSTRUCTION :

Conductor : Annealed Tinned Copper as per IEC-60228 (Class 5)
Insulation : Cross Linked Polyolefin Compound
Sheath : Zero Halogen Polyolefin Compound

FEATURES OF SOLAR CABLE :

Chemical Features
- Weather resistant
- Resistant to mineral oils
- Resistant to acids & alkaline

Electrical Features
- Voltage rating :
  1.5 (1.8) KV DC / 0.6/1.0 (1.2) KV AC
- High voltage test: 6.5 KV DC for 5 minus.

Thermal Features
- Maximum conductor temperature of operation: 120° C during 20000 hours
- Minimum operating temperature: - 40° C

Mechanical Features
- Resistant to Impact , tear & abrasion
- Minimum bending radius – 4 times of overall diameter.

CABLE DESIGN PARAMETERS :

Solar DC Cables from PV Module to Array Juntion Box (as per TUV Specifications-2 Pfg 1169/08.2007)				
Single Core Size in Sq.mm	Max. Conductor Diameter in mm	XL-LSOH Insulation Thickness-Nominal in mm	XL-LSOH Sheathing Thickness-Nominal in mm	Overall Dia. Nominal in mm
1.5	0.26	0.5	0.5	4.10 +/-0.5
2.5	0.26	0.5	0.5	4.5 +/-0.5
4	0.31	0.5	0.5	5.1 +/-0.5
6	0.31	0.5	0.5	6.1 +/-0.5

Solar DC Cables from Array Junction Box to Main Juntion Box & MJB to Inverter (as per TUV Specifications-2 Pfg 1169/08.2007)				
10	0.41	0.5	0.5	6.6 +/-0.5
16	0.41	0.5	0.5	7.7 +/-0.5
25	0.41	0.9	1	10.5 +/-0.7
35	0.41	0.9	1.1	12.0 +/-0.7
50	0.41	1	1.2	14.0 +/-0.7
70	0.51	1.1	1.3	16.0 +/-1.0
95	0.51	1.1	1.5	18.5 +/-1.0
120	0.51	1.2	1.6	20.0 +/-1.0
150	0.51	1.4	1.7	22.5 +/-1.0
185	0.51	1.6	1.9	25.0 +/-1.0
240	0.51	1.7	2.1	28.0 +/-1.0

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SOLAR CABLES

Manufactured under strict quality control for quality conscious customers using the latest technology and safety standards which makes it reliable and durable for domestic and industrial use.

FIA
FIRE INSURANCE APPROVED

TAC
TARIFF ADVISORY COMMITTEE