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Restaurant Guwahati - 781 003
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E-mail: guwahati@hplindia.com

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Desh Pande Nagar, Hubli-580029
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HYDERABAD
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MUMBAI
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PUNE
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Chattisgarh College Road, Civil Line,
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Siliguri-734001

VADODARA
409/410, Silver Oak Complex,
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Productivity Road, Akota,
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Resident Offices:

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Agra	Belgaum	Durg	Jodhpur	Mysore	Surat	Varanasi
Allahabad	Berhampur	Goa	Kanyakumari	Nagerkoil	Sholapur	Vellore
Anantpuram	Bhilai	Gorakhpur	Kolhapur	Nasik	Srinagar	
Aurangabad	Bhopal	Gulbarga	Kota	Patiala	Sambalpur	
Amravati	Bilaspur	Jabalpur	Madurai	Pondicherry	Tirupati	
Akola	Bijapur	Jabli	Malda	Rajkot	Trichy	
Angul	Calicut	Jamshedpur	Mangalore	Rourkela	Trivandrum	
Bareilly	Cuttack	Jalandhar	Meerut	Salem	Udaipur	

HPL/Wire/1-17

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Customer Care No. : 18004190198

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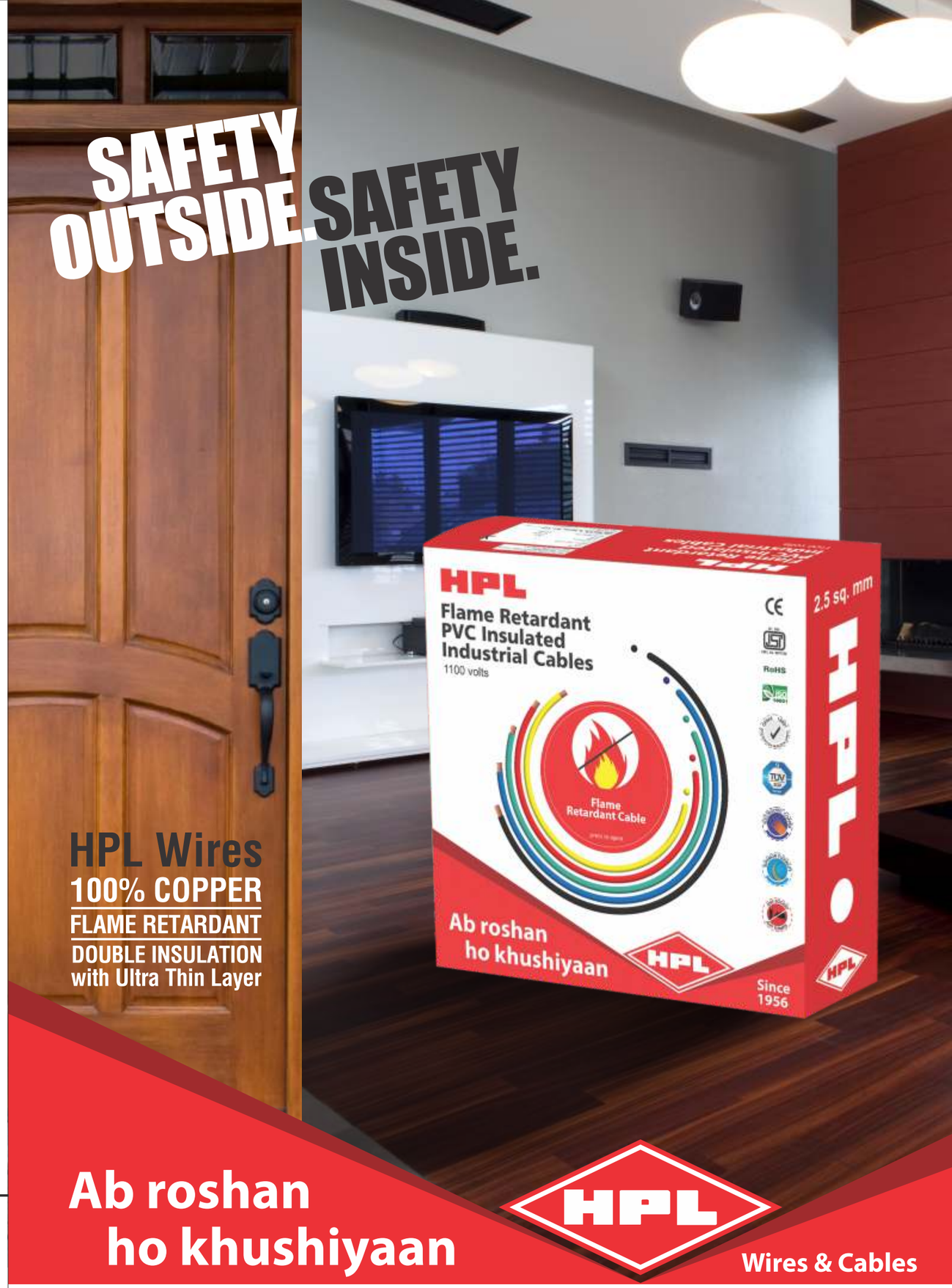


Corporate Information

HPL Group is currently the leading player in the low voltage Electrical Industry in India with commitment to state of art technology, manufacturing world class products. HPL Group has been serving Indian Industry since last 58 Years with time tested, reliable and well proven products in the field of Switchgears, Protection Devices, Electrical Energy Meters, Energy Management Systems, CFL Lamps, Luminaries, Wires & Cable and Modular Switches.

HPL Group possess nine most modern manufacturing Units, ISO 9001: 2000 certified located Gurgaon, Kundli, Sonipat, Panipat and Himachal Pradesh having 80,0000 sq. mtr. covered area to manufacture products confirming to International and Indian Standard. HPL has an R&D center with over 100 Design Engineers, who are consistently working to upgrade the product technology.

HPL Group has manpower of over 1900+ people, 90 branch offices & representative offices spread throughout the country with 2000 Authorized Dealers and 12000 Retailers across country. Who has committed to provide solutions and services to customer's delight.

HPL Cables possess ISO 9001, ISO 14001, ISO 18001 ROHS Compliant cable manufacturing facility in India at Karnal, Haryana.

Committed to the environment public health and safety HPL's out class in ensuring Ecofriendly range with CE mark.

The plant also append Industry's prominent R&D laboratory with test facilities as per IS, IEC, BS & various other international standards.

With a strong technical setup the company started manufacturing specialized cables with features like weather, gas, oil and water resistance, along with providing solutions for distortion free signalling, special bending radius, and cables that perform at temperatures ranging from minus 40˚C to plus 750˚C.

CE ELECTROLYTIC COPPER SUPERIOR FLEXIBILITY ANTI RODENT ANTI TERMITE IS : 694 CM/L No. 9977726 ISO 14001 OHSAS 18001 OCCUPATIONAL HEALTH & SAFETY TÜV SÜD

Product Portfolio

- **House Wires** (Single core/Multi core) **1-2**
- **FR-LSH Cables** **3-4**
- **HR / ZHFR Wires** **5**
- **Submersible Cables** **6**




Certifications

Single Core & Multi Core

House Wires/Single Core

Owing to our consistent efforts for quality and providing the best, we have developed exhaustive range of domestic wires and cables suitable to Indian homes and varied conditions. Manufactured with best quality of Conductor (electrolytic grade copper) and finest grade of indigenously developed PVC compound, HPL Wires and Cables give maximum safety at no extra cost.

Construction

Conductor - Bare annealed copper as per IS : 8130 / BS : 6360/IEC : 60228.

Insulation - Primary - Natural PVC with FR Property
Secondary - Skin Colour with FR Property coated PVC.

Standard - IS:694/2010.

Sizes - 0.5 sq.mm to 6 sq.mm (House Wire).
- 0.5sq.mm to 400sq.mm (Single Core).

Salient Features

- Electrolytic Grade copper having pure and maximum conductivity to ensure maximum safety.
- Bunching of copper in uniform lay & diameter, that makes stripping & crimping of wires easier & minimizes losses.
- Indigenously developed PVC compound formulated from finest ingredients and produced in-house.
- Double insulation, with primary insulation from virgin PVC, coated with ultra thin colour layer.

Single Core House Wire with Flexible Copper Conductor conforming to Ref : IS: 694/2010

HPL 1100V Grade Multi Strand Flexible Annealed Bare Copper Conductor, FR PVC Insulated and Unsheathed Single Core Flexible Cables Conforming to IS : 694/2010.

Nominal Cross Sectional Area of the Conductor (Sq. mm)	Nos./Nominal Dia. of Strand (Nos./mm)	Nominal Thickness of Insulation (mm)	Approx. Overall Dia (mm)	Conductor Resistance at 20° C Max. (Ohm/km)	Current Rating (Amps.)	
					2 Wires, In Conduit/ Trunking	1 Phase # Clipped Directly to Surface or on Cable Tray
0.75	24/0.20	0.6	2.3	26.0	8	9
1	32/0.20	0.6	2.55	19.50	13	14
1.5	30/0.25	0.7	2.85	13.30	17	20
2.5	50/0.25	0.7	3.55	7.98	24	27
4	56/0.30	0.8	3.95	4.95	30	33
6	84/0.30	0.8	4.55	3.30	38	42

NOTE : - Std. Colours - Red, Yellow, Blue, Black & Green
Normal packing length - 90 mtrs. in project packing - 180/200 mtrs.

Single Core Flexible Cables Conforming to IS : 694/2010

HPL 1100V Grade Multi Strand Flexible Annealed Bare Copper Conductor, PVC Insulated and Unsheathed Single Core Flexible Cables Conforming to IS : 694 /2010 with ISI Marking.

Conductor Area Sq. mm.	No. & Size of Each Strand mm.	Max. DC Resistance at 20°C Ohm/Km.	Insulation Thickness Nominal mm.	Cable Dia App. mm.	#Current Carrying Capacity Amp.	Conductor Area Sq. mm.	No. & Size of Each Strand mm.	Max. DC Resistance at 20°C Ohm/Km.	Insulation Thickness Nominal mm.	Cable Dia App. mm.	#Current Carrying Capacity Amp.
0.5	16/0.20	39.00	0.60	2.10	7	35	276/0.40	0.554	1.20	9.9	110
0.75	24/0.20	26.00	0.60	2.30	8	50	396/0.40	0.386	1.40	11.8	145
1	32/0.20	19.50	0.60	2.55	13	70	556/0.40	0.272	1.40	13.5	215
1.5	30/0.25	13.30	0.70	2.85	17	95	756/0.40	0.206	1.60	15.5	260
2.5	50/0.25	7.98	0.70	3.55	24	120	954/0.40	0.161	1.60	17.1	305
4	56/0.30	4.95	0.80	3.95	30	150	1192/0.40	0.129	1.80	19.2	355
6	84/0.30	3.30	0.80	4.55	38	185	1472/0.40	0.106	2.00	21.3	415
10	80/0.40	1.91	1.00	6.10	52	240	1910/0.40	0.0801	2.20	24.2	500
16	126/0.40	1.21	1.00	7.10	70	300	2380/0.40	0.0641	2.40	26.7	585
25	196/0.40	0.78	1.20	8.70	88	400	3182/0.40	0.0486	2.60	30.7	640

Multi-Core Flexible Cables Conforming to IS : 694/2010

HPL 1100V Grade Multi Strand Flexible Annealed Copper Conductor, PVC Insulated, PVC Sheathed Multi-Core Flexible Cables Conforming to IS : 694/2010.

Conductor Area Sq. mm.	No. & Size of Each Strand mm.	Max. DC Resistance at 20°C Ohm/km	Insulation Thickness Nominal mm.	Sheath Thickness Nominal				Overall Diameter Approx				#Current Rating Amp.
				2 Core mm.	3 Core mm.	4 Core mm.	5 Core mm.	2 Core mm.	3 Core mm.	4 Core mm.	5 Core mm.	
0.5	16/0.20	39.0	0.6	0.9	0.9	0.9	0.9	6.2	6.6	7.0	7.5	5
0.75	24/0.20	26.0	0.6	0.9	0.9	0.9	0.9	6.6	6.90	7.4	8.0	8
1	32/0.20	19.5	0.6	0.9	0.9	0.9	1.0	7.1	7.3	8.0	8.9	13
1.5	30/0.25	13.3	0.6	0.9	0.9	1.0	1.0	7.5	8.0	9.0	9.7	17
2.5	50/0.25	7.98	0.7	1.0	1.0	1.0	1.0	9.0	9.4	10.4	11.3	24
4	56/0.30	4.95	0.8	1.0	1.0	1.0	1.1	10.0	10.6	11.8	13.0	30
6	84/0.30	3.30	0.80	1.1	1.2	1.2		11.2	12.3	13.6		38
10	80/0.40	1.91	1.00	1.3	1.4	1.4		14.8	16.0	17.6		52
16	126/0.40	1.21	1.00	1.4	1.4	1.4		17.0	18.2	20.0		70
25	196/0.40	0.78	1.20	1.4	1.5	1.6		20.3	21.9	24.5		88
35	276/0.40	0.554	1.20	1.6	1.6	1.7		23.1	24.8	27.5		110
50	396/0.40	0.386	1.40	2.0	2.0	2.0		27.8	29.7	32.8		145
70	556/0.40	0.272	1.40	2.2	2.2	2.2		32.0	34.2	37.8		215
95	756/0.40	0.206	1.60	2.4	2.4	2.4		35.8	38.3	42.2		260
120	954/0.40	0.161	1.60	2.5	2.5	2.5		39.6	42.4	46.9		305

HPL 1100V Grade Multi Strand Flexible Annealed Copper Conductor, PVC Insulated, PVC Sheathed Multi-Core Flexible Cables Conforming to IS : 694/2010

No. of Cores	Area (Sq. mm) General Construction (No./Dia) Nom. Insu. Thickness (MM)	0.5 16/0.20 0.60	0.75 24/0.20 0.60	1 32/0.20 0.60	1.5 30/0.25 0.60	2.5 50/0.25 0.70
6	Nom. Sheath Thickness MM Maximum overall Dia. MM	0.90 8.50	1.00 9.0	1.00 9.80	1.00 10.80	1.10 13.20
7	Nom. Sheath Thickness MM Maximum overall Dia. MM	0.90 8.50	1.00 9.0	1.00 9.80	1.00 10.80	1.10 13.20
8	Nom. Sheath Thickness MM Maximum overall Dia. MM	1.00 9.60	1.00 10.20	1.00 10.80	1.10 12.50	1.20 14.80
10	Nom. Sheath Thickness MM Maximum overall Dia. MM	1.00 10.8	1.10 11.80	1.10 12.80	1.10 13.90	1.30 17.30
12	Nom. Sheath Thickness MM Maximum overall Dia. MM	1.00 11.3	1.10 12.20	1.10 13.20	1.10 14.50	1.30 17.50
14	Nom. Sheath Thickness MM Maximum overall Dia. MM	1.10 12.10	1.10 12.80	1.10 13.80	1.20 15.50	1.30 18.50
16	Nom. Sheath Thickness MM Maximum overall Dia. MM	1.10 12.60	1.20 13.70	1.20 14.90	1.20 16.40	1.40 19.50
19	Nom. Sheath Thickness MM Maximum overall Dia. MM	1.10 13.20	1.20 14.40	1.30 16.00	1.30 17.40	1.40 21.20
24	Nom. Sheath Thickness MM Maximum overall Dia. MM	1.20 15.6	1.30 17.40	1.40 18.50	1.40 20.40	1.50 24.60
25	Nom. Sheath Thickness MM Maximum overall Dia. MM	1.20 15.6	1.30 17.40	1.40 18.50	1.40 20.40	1.50 24.60
	Max. D.C. Conductor Resistance in ohm/Km. at 20°C. # Recommended Current Rating in AMP	39.00 7	26.00 8	19.50 13	13.30 17	7.98 24

Note : # Current Carrying Capacity is given considering the standard condition & basic assumptions of laying as per IS : 3961 (Part-V) 1967.

FR-LSH Cables

Whenever fire breaks-out in any building/complex, the burning of Cable emanates the toxic black smoke, which causes suffocation and subsequently becomes fatal to the human life. This compelled us to develop FR-LSH (FLAME RETARDANT LOW SMOKE HALOGEN) Cables. These Cables are quite safe during the fire break-out.

Construction

Conductor - Bare annealed copper as per IS 8130/BS : 6360/ IEC : 60228
Insulation - Unicolour FR-LSH PVC with a longitudinal olour stripe
Standard - IS:694/2010
Sizes - 1 sq.mm to 50 sq.mm

Salient Features

- Excellent fire retardant properties.
- Self Extinguishing.
- During Fire : very less toxic fumes emitted.
- Quite lesser amount of non-corrosive smoke emitted.

Technical Data

Nominal Cross Sectional Area of the Conductor Sq. mm	Nos./Nominal Dia. of Strand No./(mm)	Nominal Thickness of Insulation (mm)	Approx. Overall Dia (mm)	Conductor Resistance at 20° C Max. Ohm/km	Current Rating (Amps.)	
					2 Wires, In Conduit/ Trunking	1 Phase # Clipped Directly to Surface or on Cable Tray
1	32/0.20	0.6	2.55	19.5	13	14
1.5	30/0.25	0.7	2.85	13.3	17	20
2.5	50/0.25	0.7	3.55	7.98	24	27
4	56/0.30	0.8	3.95	4.95	30	33
6	84/0.30	0.8	4.55	3.30	38	42

* **Conductor :** As per IS : 8130-1984
 # Current Rating: As per IS : 3961 Part (5)

NOTE : - Std. Colours - Red, Yellow, Blue, Black & Green
Normal packing length - 90 mtrs.

Special Tests On HPL FR-LSH WIRES

Test	Function	Specification	Specified Values & Test	Obsd. Values
Critical Oxygen Index	To determine percentage of oxygen required for supporting combustion at room temperature of insulating material.	ASTM-D-2863	Oxygen Index: minimum 29% Test sample 7 to 15 cm long by 6.5 + 0.5 mm wide & over 3 + 0.5 mm thick in a minimum concentration of oxygen and nitrogen mixture will just support candle like burning at room temperature.	More than 32
Temp. Index	To determine at what temp. normal oxygen content of 21% in air will support combustion of insulating material.	ASTM-D-2863	Temperature Index : minimum 250° C the aforesaid procedure at various temperatures & then extrapolating to 250° C.	Around 285° C
Smoke Density	To determine the visibility (light transmission) under fire of insulating material.	ASTM-D-2843	Light Transmission : minimum 40% The test sample is exposed to flame to a 40 psi pressure for 4 minutes. The light absorption data and plotted on a graph as smoke density (%) versus time.	Around 45%
Acid Gas Generation	To ascertain the amount of hydrochloric acid gas evolved from PVC insulation of wire under fire conditions.	IEC 754 - I	Hydrochloric acid gas released : 20% max. 0.5-1 gram of the material from the wire insulation/sheath is burnt in a ceramic tube inside a tubular furnance at 800° C. The volume of corrosive gases (HCL) present in the combustion products are analyzed chemically.	Around 15%
Flammability test on group of cables	To determine flame propagation of wires in installed condition.	IEEE - 383	In total 20 minutes of burning 8 ft. wire length samples with flame temp of app 1500° F. The burning of Cables should not go to the top.	Satisfactory
Flammability test	1) To determine ignition resistance & flame propagation under specified conditions.	Swedish standard No. SS-424-17	From test sample of 850mm length. The un-burnt portion shall be more than 300 mm from the top.	Satisfactory
	2) To determine ignition resistance & flame propagation under specified conditions.	IEC 332-1	In the calculated time duration of burning the Cables wire sample of 600 mm 25 mm length the length of un-burnt portion to be min 50 mm from the top.	Satisfactory
	3) To determine ignition resistance and flame propagation, especially from bunch of wire under specified conditions.	IEC 332-2	From test sample of 3.5 mtrs. length effected portion during burning, shall not reach 2.5 mtrs. above from the bottom edge of the burner.	Satisfactory

HR / ZHFR Wires

Our Heat Resistant Cables can withstand upto 85° C / 105° C (as per requirement) operating conductor temperature. HPL HR Cables have 30% more current carrying capacity in comparison to FR Cables.

HPL Zero Halogen Fire Retardant Cables are recommended specially in a situation where high degree of safety of personnel and equipment are used for application like Hotels, Theaters, Hospitals, High-rise buildings, Commercial complexes, Centrally A.C. offices, Residential properties etc.

Owing to its special insulation characteristics the wires continue to provide uninterrupted power supply even during fire- keeping alive fire alarm circuits, exit lights, Lifts & other emergency Circuits.

HPL ZHFR Cables are made to International standards and carry a guarantee that far exceeds the minimum requirements.

Construction

Conductor - Bare Annealed Copper as per IS : 8130 / BS : 6360 / IEC : 60228

Insulation - HR grade / ZHFR compound

Sizes - 1.0 sq.mm to 50 sq.mm

Single Core, ZHFR Insulated Cables In Voltage Grage 1100V.

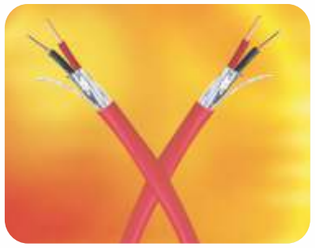
Nominal area of Conductor (Sq.mm)	Number/Nom. Dia. of wire (Nos./mm)	Nominal Thickness of Insulation (mm)	Approx. Overall Diameter (mm)	Max dc Resistance @ 20° C (Ohms/Km.)	Current Rating (Amps.)
1	32/0.20	0.6	2.55	19.50	13
1.5	30/0.25	0.7	2.85	13.30	17
2.5	50/0.25	0.7	3.55	7.98	24
4	56/0.30	0.8	3.95	4.95	30
6	84/0.30	0.8	4.55	3.30	38

A brief comparison of PVC Cables and ZHFR Cables is given below :

Properties	HR PVC	FR-LSH	ZHFR
Halogen Gas (mg/g)	>200	<150(max)	<0.5(max)
Corrosive Gas (pH)	1 - 2	2 - 3	6.0
Smoke Density (Rating)	85	50	10
Usage Temperature (°C)	85/105	70	90
Low Temperature (°C)	-20	-20	-50

Additional ZHFR Properties

Properties	Test Method	Value
Limited Oxygen Index	ASTM - D 2863	35%
Limited Temp. Index	ASTM - D 2863	> 300°C
Smoke Density (Light absorption)	ASTM - D 2843	< 10%
Acid Gas Generation	IEC - 60754 - 1	< 0.5%



Submersible Cables

HPL is one of the most unique & versatile product. An example of our fine workmanship, is our flexible cables for submersible pump motors. Widely accepted & acclaimed, it enjoys the reputation of being the best in industry.

Construction

Conductor - Stranded Flexible bare annealed electrolytic grade copper

Insulation - Specially formulated PVC (Type - A, C & D)

Outer Sheath - Specially formulated PVC (ST-1 & ST-3)

Size - 1 to 50.0 Sq mm three core flat submersible cable as per customer specific requirement.

Standard - IS 694/2010

Applications

PVC insulated multistrand annealed bare copper conductor, three core flat PVC sheathed cable are used for giving electrical connection to the submersible pump motors.

HPL Cable 3-Core Flat Cables for Submersible Pump Motors (Technical Date)

Area (Nom.) Sq. mm.	Number/ size of Wire No./mm	Insulation Thickness (Nom.) mm.	Sheath Thickness (Nom.) mm.	Height 'H' (Maximum) mm.	Width 'W' (Maximum) mm.	Resistance at 20°C (Maximum) Ohm/Km	Current carrying capacity at 40° Amps
1	32/0.20	0.6	0.9	4.5	9.9	19.50	13
1.5	30/0.25	0.6	0.9	4.8	10.8	13.30	17
2.5	50/0.25	0.7	1.0	5.7	12.9	7.98	24
4	56/0.30	0.8	1.0	6.2	14.5	4.95	30
6	84/0.30	0.8	1.1	7.2	16.4	3.30	38
10	80/0.40	1.0	1.4	9.2	21.5	1.91	52
16	126/0.40	1.0	1.4	10.3	24.7	1.21	70
25	196/0.40	1.2	2.0	13.1	30.9	0.780	88
35	276/0.40	1.2	2.0	14.3	34.6	0.554	110
50	396/0.40	1.4	2.2	15.5	40.5	0.386	145

*** Conductor :** Class 5 of IS : 8130/84

Salient Features

- Bright annealed electrolytic grade copper having 100% purity and maximum conductivity to ensure minimum power losses. Cores are insulated on modern & precision machines using specially formulated PVC compound having very high thermal properties.
- Indigenous PVC compound provides better ageing properties, higher operating temperature & enhance insulation characteristics.
- Outersheath for Submersible Cables is designed to fit closely, maintain flexibility, resist water absorption, abrasions, oil, grease and other environmental effects.