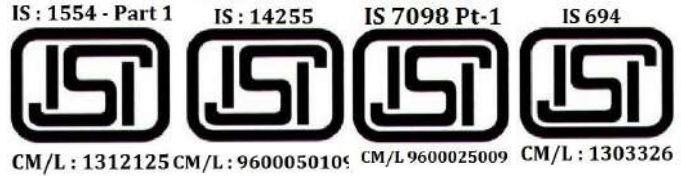




# ***Saraswati Cables & Allied Industries***



**QUALITY ENGINEERING SINCE 1982**

Saraswati Cables, located on a spacious 6000 m<sup>2</sup> plot in the serene foothills of the Shivalik range in Una in Himachal Pradesh( adjacent to famous Bhakra- Nangal Dam) was established in 1982 under the able leadership of Mr. Madan Mohan Singh, a former scientist at the Bhabha Atomic Research Centre, Mumbai.

Saraswati Cables is a family-owned company operating in a globally competitive industry. As owners, we are proud of the company's legacy and good standing in the community. We have been into Electric Cable Manufacturing for over 4 decades now. We are long-term owners and have a long-term perspective. We were conferred by the BIS in 2022 as one of the oldest electric cable manufacturer from Himachal Pradesh.

We are one of the leading manufacturers in Northern India of various types of cables used in diverse fields of power distribution, control, electronics and communication systems. With more than Four decades of a strong, customer-focused approach and a zeal for quality has enabled the Company, to manufacture various types of cables used in diverse fields of power distribution, control, electronics and communication systems.

It was a glorious moment in the career of the company, when in 1987 it was selected to supply the entire High Speed Data Communication Cable needs of the Missile Test Range at Chandipur (Odisha) ,under the Ministry of Defence, Government of India, against stiff competition from the best names in the industry. This contribution of the company helped significantly in the successful launch of our country's first Intermediate Range Ballistic Missile 'AGNI-1' in 1989, and was highly appreciated by the officials of the Ministry of Defence, Government of India.

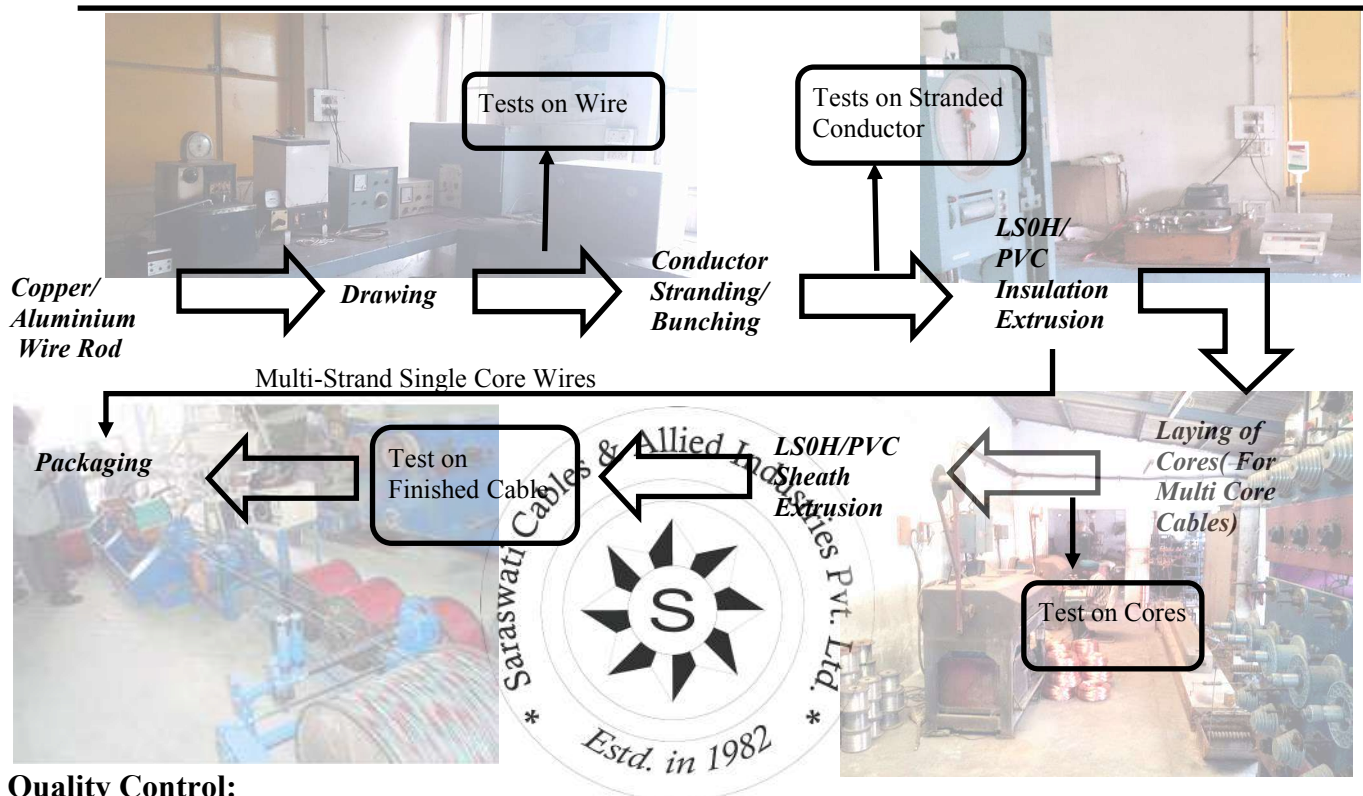
Our portfolio includes the following cable types:

- **Power and Distribution Cables**
- **Flexible Copper Control Cables and Signaling Cables : -**
- **Screened/ Shielded Control/Instrumentation/Signal Cables**
- **Appliance Wires and Plugs**
- **Telephone Cables**
- **Fire Survival Cables / Flame Retardant Cables**
- **Water Resistant/Blocking Cables AD7/AD8 Levels**
- **Electric Vehicle Charging Infrastructure Cables conforming to IEC 62893 / UL 2263**
- **Special cables as per customer requirements are also manufactured depending upon governing specifications.**





## CABLE MANUFACTURING & QUALITY CONTROL



### Quality Control:

In the manufacture of cables, consistent intelligent efforts are incorporated to achieve quality. For quality end products, control starts from proper design of the product. All raw materials are selected carefully and only materials of high quality are used in production. Having done this, stage wise inspection is done to ensure conformity with the requirements of relevant Indian Standards where these apply.

### Stage Wise Inspection of Wire Process:

#### Wire-Drawing :

- ⇒ Wire diameter/ Surface/Shape
- ⇒ Quality of joints in the wires
- ⇒ Compaction of conductor
- ⇒ Shape of Conductor
- ⇒ Resistance of Conductor

#### Laying Up :

- ⇒ Sequence of Cores
- ⇒ Diameter over laid up cores
- ⇒ Circularity

#### Insulation & Sheath:

- ⇒ Dimension over Insulation,
- ⇒ Thickness of Insulation,
- ⇒ Thickness of Sheath
- ⇒ Diameter over Sheath
- ⇒ Tightness of Sheath
- ⇒ Eccentricity
- ⇒ Embossing & Printing

### Tests Conducted on Cables

#### Routine Tests:

- Conductor Resistance Test
- High Voltage Test

#### Type Tests:

- Tensile Test (Al Conductor)
- Wrapping Test (Al Conductor)
- Annealing Test (Cu Conductor)
- Conductor Resistance Test
- Test for thickness of Insulation & Sheath
- Physical Test for Insulation & Outer Sheath
- Insulation Resistance Test
- High Voltage Test
- Flammability Test

#### Acceptance Tests:

- Tensile Test (Al Conductor)
- Wrapping Test (Al Conductor)
- Annealing Test (Cu Conductor)
- Conductor Resistance Test
- Test for thickness of Insulation & Sheath
- High Voltage Test
- Insulation Resistance Test
- Physical Tests on Insulation & Sheath

#### Optional Tests:

- Oxygen Index Test
- Temp. Index Test
- Smoke Generation Test
- Acid Gas Generation Test
- Flammability Test
- Water absorption test





IS: 1554 - Part 1

IS: 14255

IS 7098 Pt-1

IS 694





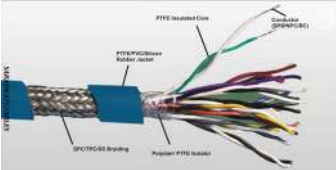
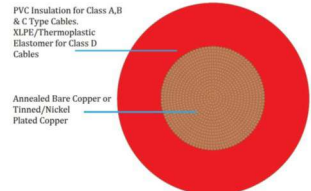
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## CABLE RANGE AT A GLANCE

Type of Cable	Application	Options	Cross Sectional View
<b>Power Cables</b> PVC/XLPE Power cables for 1.1KV for Electrical substations as per IS:1554 -(Part I ) & IS:7098 -(Part I ) Sizes: Single Core 10-630 sq. mm multi core 4-630 sq. mm	Cables for supply to residential, commercial & industrial units	Conductor—Stranded/Solid, Circular /Shaped Aluminium / Copper Insulation - PVC / XLPE Unarmoured / Armoured Outer Sheath - PVC/EVA/ZHFR	
<b>Control /Instrumentation Cables</b> Annealed electrolytic copper conductor, PVC / XLPE insulated, PVC sheathed 650/ 1100V grade as per IS: 1554-( Pt-I) & IS:7098 -(Part I ) Sizes : 1.5 / 2.5 sq. mm upto 61 core4 , 6,10 Sq. mm upto 19 core	Copper control cables for power switch yard control / relay equipment / Instrumentation/ Signal Cable	Conductor - Solid/Stranded, Plain / Tinned Insulation - PVC /XLPE Unarmoured / Armoured Outer sheath - PVC/EVA/ZHFR	
<b>Submersible Cables</b> Bright annealed EC Grade copper, PVC insulated & PVC sheathed of 1100V grade as per IS: 694:2010 Sizes:3 core– 1.5 to 50mm <sup>2</sup>	Flat cables for Submersible pumps & motors	Conductor: Copper as per IS 8130 Insulation - PVC / HR PVC / XLPE /HEPR Sheathing - PVC / XLPO	
<b>Service Connection Cable</b> PVC insulated & PVC sheathed Aluminium conductor Twin flat conforming to IS 694 :2010 Voltage rating up to 1100V Sizes :2 core Sizes up to 50mm <sup>2</sup>	Fixed wiring cable primarily for installations from Electric Poles to Electric Meters of Commercial Units.	Conductor-Aluminium conforming to IS 8130 Insulation– PVC Sheath—PVC Color options: Blue/ Black as per request.	
<b>Multicore Flexible Cables</b> Multi strand, flexible, bright annealed electrolytic copper conductor, PVC insulated & sheathed up to 1100V as per IS:694:2010 Sizes : single, two, three or four core upto 19 cores, from 1mm <sup>2</sup> —25 mm <sup>2</sup>	Flexible cords & cables for appliances, machine tools & equipment wiring	Conductor: Copper as per IS 8130 Insulation - PVC / HR PVC / FRLS / Zero Halogen Unsheathed /Sheathed - PVC	
<b>Building Wires</b> Multi strand flexible, up to 1100V grade PVC Cables as per IS: 694:2010 Sizes :Single core 0.75 - 630 sq. mm	Wiring cables for electrical industry	Conductor - Bright annealed Copper as per IS 8130 Insulation - PVC/ HR PVC/ FRLS PVC /Zero Halogen	
<b>PVC/TPE Flexible</b> Cables up to 750v grade as per IS:694:2010 Sizes :1.0 up to 240 sq. mm Single / Multi Core	Energy Cables for Power Supply To Telephone Exchanges /UPS/Battery Backup /Equipment's for High Current Low Voltage.	Conductor - Stranded / Solid bright annealed Copper as Per IS 8130 Insulation - PVC / HR PVC / FRLS / Zero Halogen	
<b>Solar Cables</b> : Compliant to IEC 60364-5-52;IS 17293:2020 , IEC 62930 , EN 50618 ; Weathering UV: HD 605/A1 or DIN 5336	These are suitable for outdoor long-term installations directly exposed to solar radiations. Stringent requirements are set for these cables. These cables are weather and UV resistant. . Water Resistant to AD7 levels	Conductor - Flexible Stranded / bright annealed Copper as Per IS 8130 , IEC 60228 ( With metal Plating Optional ) Insulation - XLPO Outer Sheath : XLPO	









## CABLE RANGE AT A GLANCE

Type of Cable	Application	Options	Cross Sectional View
<b>Wind Turbine Generators, Power and Control Cables for Wind Energy :</b>	Low voltage cables offering torsional resistance, including Loop Screened cables and variants in LSZH and PVC materials as required. Cables are suitable for medium mechanical stress or for operations outdoor or under permanent influence of seawater. Oil, UV, Ozone resistant, Cables are compliant to IEC 60502, CSA C22.2 , UL 758	Conductor : Class 5 /6 Stranded Tinned Copper or Class 2 Aluminium Insulation : XLPE , XL-HFFR, HEPR or PVC Separator: PET (Polyester Tape) Screen : TCWB or GI WB or Outer Sheath : XLPE / XL HFFR, XL-EVA or XL-PO or PVC	 
<b>Single Phase &amp; 3 Phase Distribution Power Cables :</b> Aerial Bunched Cables 3 Phase + Messenger Conductor + Street lighting conductor rated upto 1.1KV as per IS 14255 Sizes : upto 95 Sqmm	Distribution of electricity to individual consumers, Allows reduced Cable Weight for easier installation in Hilly terrains. Allows longer Pole to Pole Span in comparison to sheathed cables.	Phase and Street Conductor :- EC Grade Aluminium as Per IS 8130 Insulation :- XLPE Messenger :- Aluminum Alloy as per IS 398 Part 4	
<b>Covered Conductors :</b> For ratings 1KV, 11KV, 22KV & 33KV, with AAAC/ACSR Conductor Configuration conforming to EN 50397 ; SS EN 50397-1, BS EN 50182, IS 398-2, IS 398-4, IEC 61089	Electricity Transmission and Distribution	Conductor : AAAC or ACSR Conductor Screen ; Semi Conducting Compound ; Insulation : XLPE ; Outer Sheath : XLPE Suitable Weathering Resistant Grade	
<b>Cables for Defence Military/ JSS/ Aircraft GOST Specification cables</b>	Used in Various Military and High Demanding applications for purposes of power Transmission and Data Communication	Conductor : EC Grade Copper with Tin, Nickel or Silver Plating Insulation ; PTFE, FEP, Varnish, PVC, XLPE, PEEK Screen/Armour : Copper/Aluminium/ Steel Braid Sheath : PTFE, FEP, Varnish, PVC, XLPE, PEEK	
<b>UNINYVIN CABLES</b>	These cables are widely used in Aircraft Cabling.	Conductor : Metal Coated Copper Insulation : Special Core Insulation HR -PVC 105 Deg C Primary Braid : Braided with glass Fiber, 100% Coverage Secondary Braid : Braided with Nylon Fiber, 100% Coverage Lacquer : Overall Nylon Varnish	
<b>Automotive Cables,</b> Compliant to ISO 6722 , JASO D 611, D 607, JIS C3406 , SAE J 1678,	Used in Auto vehicles for signal and instrument Panel Circuit. Heat resistant cable, Engine Management Systems, Engine Compartment Wiring, Lamp Wiring Systems	Conductor : EC Grade Copper, Tinned/ Nickel Coating options available as per customer requirement. Insulation : XLPE ; XL-LSOH , HR Grade PVC suitable upto 105 Deg C , Thick, Thin & Ultra Thin Insulation Grades available.	






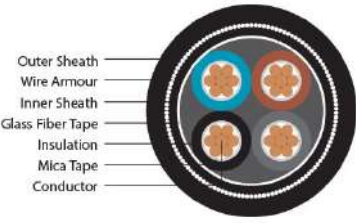

## CABLE RANGE AT A GLANCE

Type of Cable	Application	Options	Cross Sectional View
Charging Cables compliant to IS 17017, IEC 62893 , EN 50620	The cables may be an integral part of the vehicle or a detachable cable assembly with a vehicle connector and AC supply connection to a socket outlet or permanently attached to a fixed charging point .	Conductor - Flexible Stranded / bright annealed Copper as Per IS 8130 , IEC 60228 ( With metal Plating Optional ) Insulation - LS0H Grade Insulation with AD7 Resistance level Outer Sheath : Specially Formulated PVC or LS0H or PUR HF Grade	
<b>Cat 6/8 Ethernet Cables;</b> Available in Round/Flat Configuration	Power over Ethernet Applications / 40 G Bandwidth / Used in Data Centres and Switching Centres	Conductor : 26 AWG EC Grade Copper No of Pairs : 4 Pair Screening : Aluminium/Foil Mylar backed Shield Insulation : PE Braid : 100% Braided Shield OuterSheath: PE /LS0H ;	
<b>PROFIBUS Cable</b>	Profibus cable for industrial fieldbus systems particularly developed for process Automation and Instrumentation Applications including connecting sensors and actuators . Cables are conforming to IEC 61158, UL 1581.suitable alternative to Belden 3079A for many applications.	Conductor : Bare Copper Wires Insulation : Solid PE Separator : PET Inner Sheath : PVC/LSZH /LSZH /LSZH Filler : PET Shield: Poly/Aluminium Tape Braid : TCWB (Tinned Copper Wire Braid) 60% Coverage Armour : GI Wire Braid Sheath : PVC /LSZH	 
<b>KNX EIB (European Installation Bus) communication cable</b>	With its excellent electrical and shielded transmission performance, KNX EIB cables can be used for data transmission and to connect building technology systems, allowing the operation and control of lighting and climate control. EIB cables can be deployed both in private houses and public places. Not approved for power and underground installation. Cables are compliant to EN 50090, EN 60669-2-1	Conductor : Solid bare copper wire conductor Insulation : Halogen Free Flame Retardant Compound Tape : Plastic Foil Shield : Al/PET (Aluminum /Polyester Tape) along with Copper Drain Wire Outer Sheath : LSZH (Low Smoke Zero Halogen)	
<b>LYiCY Cables As per VDE 0812</b>	LiYCY cable can be used for signal transmission between electronic devices, in computer systems or process control units with increased electromagnetic compatibility requirements. Reference Specifications : VDE 0812	Conductor : Flexible bare copper wire conductor Insulation : Specially Formulated PVC Separator : Plastic Foil Shield : Tinned Copper Wire Braid Outer Sheath : Specially Formulated PVC	





## CABLE RANGE AT A GLANCE

Type of Cable	Application	Options	Cross Sectional View
<b>Reeling/Trailing Cables</b>	Vertical reeling cable under high mechanical stresses, torsion, tension and torque. Mainly used for spreader reeling applications. Strength member to increase tensile load, acceleration and speed. PUR sheath offers a very good protection against hydrolysis, solvents, alkaline and oils. Cables are conforming to IEC 60502,	Conductor : Class 5 Flexible Stranded Copper Conductor Insulation : Halogen Free Flame Retardant Compound Lay Up : Central Aramid strength member, cores in concentric layers Inner Sheath : PUR-HF (Halogen Free, flame retardant Polyurethane) Braid : Anti-twisting element - Aramid yarns braiding Screen : TCWB (Tinned Copper Wire Braid) Outer Sheath : PUR-HF (Halogen Free, flame retardant Polyurethane)	
<b>Marine Offshore Power Cables</b>	Power Marine cables are designed to perform in extremes of temperatures, both high and low, and to be resistant to adverse elements such as humidity, oil, acid, muds and salt water, as are prevalent in most marine and offshore operational environments. Cables are conforming to IEC 60092 & NEK 606	Voltage Rating : 0.6/1.1 KV Conductor : Class 2 Stranded or Class 5 Flexible Copper Conductor Fire Resistant Barrier : Glass Mica Tape Insulation : LS0H Inner Sheath : SHF Mud Resistant Screen : (Tinned Copper Wire Braid) Outer Sheath : SHF Mud Resistant	
<b>Marine Offshore Control &amp; Instrumentation Cables</b>	Instrumentation and telecommunication cable for fixed installation in signal and communication applications. Suitable for installation in all marine environments such as muddy, wet, dry and oily conditions. Cables are conforming to IEC 60092 & NEK 606	Voltage Rating : 150/250 V Conductor : Class 2 Stranded or Class 5 Flexible Copper Conductor Fire Resistant Barrier : Glass Mica Tape Individual Screening : Copper Polyester Taped or TCWB Insulation : LS0H Inner Sheath : SHF Mud Resistant Overall Screen : TCWB (Tinned Copper Wire Braid) Outer Sheath : SHF Mud Resistant	
<b>Fire Survival Cables</b> compliant to IS 17505 Part 1, IEC 60331/, BS 6387 C W Z, EN50200, BS 8434 and BS 8491 & Limited Fire Survival Cables Compliant to IS 16246, IEC 60332; IEC 60331	Fire Survival Cables are designed to remain into operation at high temperatures like 650°C, 750°C and 950°C as per various conditions of operation and applications. Limited Fire Survival Cables are used in places of Safe Evacuation of Personal in case of fire in confined areas.	Conductor : EC Grade Copper Heat Barrier Tape : Glass mica tape, Insulation : XLPE, XL-HFFR Inner Sheath : Thermoplastic Filler, Armour : GI Steel wire/ Double Steel tape Outer Sheath : XLPE / XL HFFR	
<b>Flat Travelling Cables</b>	Power & Control Flat Cables can be used on festooned Systems on handling equipment for Lifts, Elevators and Escalators. Governing Specifications : IEC 60227 Part 6	Conductor : Class 5 Flexible Stranded Copper Conductor Insulation : Specially Formulated Flexible PVC or LS0H Outer Sheath : Specially Formulated Flexible PVC or PUR HF	



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**NATHPA JHAKRI HYDRO  
POWER STATION**



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