

UNISTAR[®]

UNIVERSAL CABLES LIMITED

**ELASTOMERIC
CABLES**



ISO 9001:2000



ELASTOMERIC CABLES

Universal Cables Ltd. manufactures elastomeric cables up to 33 KV grade as per IS, IEC, BS, VDE and other international standards including tailor made cables to customer's requirements. These cables are manufactured with EPDM, Silicone, Fluoroelastomer, CSP, PCP, NBR-PVC, EVA and other types of rubbers. Processing of a good quality cable needs right technology starting from manufacturing of conductor, compounding, insulation, laying up, sheathing and vulcanization. The process used contributes significantly to build inherent strength of the cable for long life and performance.

Universal Cables Limited adopts state-of-the-art technology for making specialty rubber cables. This ensures the product of high quality, safety and reliability as the cables are used for critical applications in the areas like Mines, Railways, Defence, Steel Plant, Windmill, earth moving equipments etc.

COMPOUND DEVELOPMENT :

Initially the basic information to design the compound to meet specified requirements are collected. A team of highly qualified Scientists and Engineers carry out the systematic study in laboratory scale to develop compound with the help of advanced equipments such as FTIR, DSC, TGA, HPLC, Brabender Plasticorder etc.. The processability is then studied with the help of Monsanto Rheometer. After achieving the best combination of properties and processability in laboratory scale, the compound is scaled up for commercial production.

R&D LABORATORY :

The Research & Development Laboratory is well equipped with modern equipments for testing and development of cable & cable compounds. The Department of Scientific and Industrial Research, Ministry of Science and Technology, Government of India has recognized the Laboratory.



Monsanto Rheometer



FTIR

MACHINERY & EQUIPMENTS :

Latest machinery & equipments are used in all stages of processing starting from manufacturing of conductor, rubber compound, laying, extrusion and vulcanization to the final testing. Qualified and experienced engineers back the operations.

WIRE DRAWING :

Copper wires are drawn from electrolytic grade CC rod of 99.96% purity level on machines equipped with in-line annealer. This process enables to produce wire with uniform annealing.

ELECTRO TINNING :

Tinning of fine copper wires is carried out by electro tinning process. This process ensures smooth, uniform and homogenous tinning with bright finish to the wire.



Electro Tinning Plant

BUNCHING :

Long lengths of bunches are produced on high capacity bunching machines (530mm Take-up) which result in joint less final conductors.



Bunching Machine

FLOATING CARRIAGE STRANDING :

All flexible conductors are rope stranded on floating carriage type machines. The conductors produced on floating carriage machines are highly flexible and are free from back twists and kinks.

COMPOUNDING :

The rubber compounding is carried out in an internal mixer, widely known as Inter-Mix. This is unique rubber compounding machine where mixing is accomplished inside a closed chamber by rotating rotors of special design to ensure complete sheering, thorough mixing and uniform dispersion of various compounding ingredients into the rubber matrix. Batch to batch variation of properties, loss of

ingredients during mixing are minimum in compounds produced in Intermix.



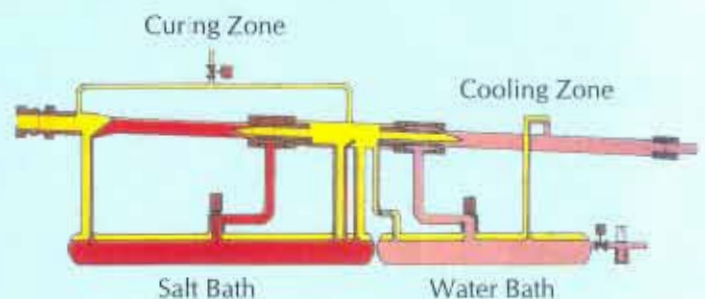
Intermix

EXTRUSION & CONTINUOUS VULCANIZATION :

The Pressurized Liquid Salt Continuous Vulcanization (PLCV) Process : In this process three layers can be extruded simultaneously by using dual tandem extrusion and continuously vulcanized by passing the cable through Eutectic molten salt mixture bath maintained at 200°C under nitrogen pressure.

ADVANTAGE OF PLCV PROCESS :

Dry Cure : Steam is not used in this process hence there is no possibility of any void formation in the dielectric, consequently such cables offer better reliability and service.



High heat transfer co-efficient : This offer very high cure rate and high degree of cross-linking.

Independent temperature & pressure : For obtaining optimum properties, the two parameters of vulcanization i.e. pressure & temperature should

ideally be independently variable. Low pressure and high temperature is ideal for best combination of properties, which is only possible in PLCV Process.

Multi layer co-extrusion & co-vulcanization : Three layers can be extruded simultaneously. This offers interfaces free from contamination and voids. The process also offers physical as well as chemical adhesion between the layers.

Cable produced in PLCV process offer excellent flexibility and smooth surface finish.



Lead Extruder



PLCV

CURING UNDER LEAD SHEATH :

Multi core cables where high compactness is required with reinforced sheath for stacker and reclaimer, LHD machines, earth moving equipments etc are vulcanized under lead. In this process the rubber compound fills all the interstices and gap in the cable under high pressure of lead during vulcanization. This process provides smooth surface finish and compact cable.

MANUFACTURING PROCESSES

STAGE	NORMAL	<i>unistar</i>	ADDED FEATURE
Wire drawing	Batch annealing	In-line annealing	Consistent & uniform annealing resulting in high flexibility
Tinning of Wire	Hot dip tinning	Electro tinning	Uniform, smooth & bright surface finish
Bunching	Low loading capacity	High loading capacity	Longer lengths of finished Cables
Stranding	Fixed carriage standing	Floating carriage stranding	Highly flexible conductors with out back twists & kinks etc. resulting in better performance & longer life during reeling - unreeling operation.
Compounding	Open roll-mill or kneader type mixer	Inter Mix	Complete sheering and uniform dispersion of ingredients into the rubber matrix, resulting in superior and consistent thermo - mechanical and electrical properties.
Extrusion & Vulcanization	Uni-layer extrusion & Co-vulcanization in CV or batch Vulcanization by Autoclave by high pressure steam	Uni-layer as well as multi layer extrusion & Co-vulcanization in PLCV Line	Dry cure, high degree of cross linking void and contamination free interface, good adhesion between Layers, superior flexibility and smooth surface finish.
Curing of reinforced sheaths	Under tape in Autoclave	Under lead	Highly compact cable with smooth surface finish giving longer life in reeling-unreeling application

APPROVALS:

The quality of UNISTAR cable is well recognized and company maintains product approvals from DGMS, RDSO, IRS, NPCIL etc. The company also have well maintained Quality Management and Environmental

Management Systems as per ISO 9001 & ISO 14001 duly certified by Bureau of Indian Standards, New Delhi.

SPECIALITY CABLES

(TYPE & APPLICATIONS)

TYPE OF CABLE	APPLICATION
Flexible Cables	General wiring, Trailing, Control & Power distribution.
Mining Cables	Land Line, LHD & SDL Machines, Drills, Coal cutters, Stacker-Reclaimers & earth moving equipments.
High temperature Silicon Cables	High Temperature locations in furnaces & steel plants.
Wind Mill Cables	Wind Energy Generators.
Ship Wiring Cables	Power & control cables for ships & defence application.
Oil Rigs Cables	Power & Control circuits for Oil Rigs
200°C Fluoroelastomeric Cables	Traction motors
Fluoroelastomeric Lead Wires	Brush gears connector cable in traction motor
120°C Thin wall cables	Tap changer Electric Locomotives/EMU's /AC coaches
Cadmium-Copper Catenary Cables	25 KV ac Electric Traction
Radiation resistant cables	Nuclear power plants
Fire survival cables	Circuit integrity during fire hazards for critical application

