



XLPE INSULATED POWER AND CONTROL CABLE

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.

CONDUCTOR :

Conductors are made from Electrolytic grade high pure 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 :

XLPE 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/natural
Two core	Red, black
Three core	Red, yellow, blue
Four core	Red, yellow, blue, black
Three and half core	Red, yellow, blue and reduced neutral 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 the inner sheath does not exceed 13 mm, above 13 mm, flat steel strip armour is used.

Round wire of different sizes can also be provided against specific request.

PVC JACKET :

Specially formulated heat resistant black PVC compound St2 type as per IS 5831 : 1984 and is extruded to form the jacket.

Step also offers specially formulated Flame Retardant Low Smoke (FRLS) compound for jacket used in fire hazardous environment.

TESTS

In addition to all tests required as per IS 7098 (Part I) 1988, STEP 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. The cables are marked with ISI mark.

PRODUCT CODE :

As per IS 7098 (Part I) 1988, the codes are

Constituent	Code
Aluminium conductor	A
XLPE Insulation	2X
Steel round wire armour	W
Steel strip armour	F
Steel double round wire armour	WW
Steel double strip armour	FF
PVC jacket	Y

ADVANTAGES OF XLPE INSULATED POWER CABLE

Following are the advantages of 'XLPE' insulated cables over that of PVC Insulated cables:

- Higher Current Rating :
Withstands continuous conductor temperature of 90°C, whereas PVC withstands only 70°C, which means higher current carrying capacity.
- Higher Overload Capacity :
'STEP' 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 'XLPE' cables even in cramped space conditions. The cables require less support, thus lowering installation costs.
- Lower Di-electric Constant and 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 and Termination :
Requires no special skills or equipment for jointing and termination.

COMPARISON OF PROPERTIES

		FINVUL-X	PVC
Dielectric Constant		2.35	6 to 8
Dielectric strength	KV/mm	22	14
Volume Resistivity at 27°C	Ohm-cm	1014	1013
Thermal Resistivity	°C cm/W	350	600
Power Factor at maximum conductor temperature		0.008	0.1
Normal conductor operating temperature	°C	90	70
Emergency overload temperature	°C	130	120
Maximum short circuit temperature	°C	250	160

IS : 7098(Part I)



