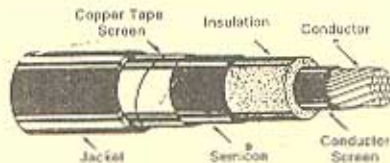


WHY ARE XLPE CABLES SCREENED ?

Construction of screened XLPE Cable :

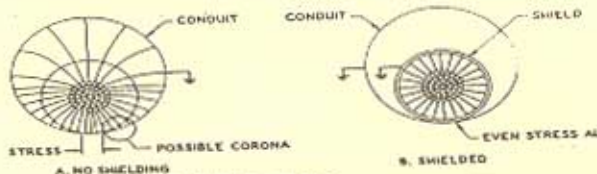
Screened XLPE cables made to IS : 7098 part 2 for voltages from 6.6KV to 33KV employ a common construction for individual cores. A typical core is shown in figure 1.



A semi conducting, screen is applied over the conductor. The XLPE insulation is co-extruded over this together with a semiconducting layer which is provided for collecting the leakage currents. This consists of metal tape screen or copper wires. Three such cores or a single core may be bundled together to form a cable with an inner sheath, armour, layer, and an outer sheath.

Why Screening

Screening provides a ground plane at a uniform radial distance from the conductor. This ensures that the electrical field within the cable remains uniform. There is no local concentration of high voltage stresses. The uniformity of the field enables more precise design and analysis. This results in economy in the insulation thickness.



Capacitive coupling between a charged conductor and an ungrounded surface can develop a voltage on the ungrounded surface. This voltage can be dangerous to life, specially at the higher voltage. Provision of a grounded screen ensured that such dangerous potential do not develop.

Importance of Screen Bonding to Insulation

The interface of screen and insulation must be totally free of any air voids. An air void bounded by a grounded screen on one side can develop a potential gradient along the insulation boundary. Under certain conditions, the potential difference can cause "partial discharges" which are harmful to the cable insulation .

XLPE material is very good in di-electric strength and volume resistivity. Unfortunately it is very easily damaged due to Corona or associated ionisation. Since XLPE insulation is otherwise expected to have a service life in excess of 30 to 40 years, it is necessary to ensure that the Corona discharge levels remain low enough not to cause damage even after 40 years of service.

The most popular construction of medium voltage cables today is the screened XLPE insulated cable . This construction is used for voltages from 6.6 KV upwards. This note explains the purpose of screening.

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