

3.5 Polymeric Insulated Distribution Cables for 6-30 kV

- In the 6-30 kV cable range there has been a world-wide swing away from paper to polymeric insulation for distribution cables.
- In the UK, in terms of usage, the scale of change has been smaller and its speed slower than in many other countries but, because much of the UK cable is made for export.
- The pattern of manufacture has moved substantially towards an increased proportion of cable with polymeric insulation.
- Trends in the comparative costs of the cables themselves can be expected to have influenced the change, but another factor is that it has become increasingly difficult to secure, at reasonable cost, the skills required to joint and terminate the traditional paper cable.
- This is especially the case in the less developed countries.

Field Of Use:

- Initially the thermoplastic polyethylene insulation was the most popular with many kilometers of cable installed in Germany.
- HDPE has superior electrical properties to LDPE but is more rigid; HDPE is more crystalline than LDPE and thus capable of operating at a higher temperature and it has been assigned a sustained rating of 80°C, in comparison with 70°C for LDPE.
- Its saturation moisture content is approximately a fifth of that of low density materials; nevertheless, its greater stiffness has mitigated against its wider acceptance.
- Generally the use of EPR has been confined to those applications where its property of greater flexibility can be used to advantage, but in Italy and Spain EPR has been used widely throughout the voltage range.
- Although 132kV cables have been manufactured with EPR, the higher loss angle and poorer thermal resistivity make it a poor competitor against XLPE at higher voltages.
- While EPR has excellent resistance to ozone and electrical discharges and the material was for this reason preferred to PE during the 1960s, changes in manufacturing techniques have led to a reduction in discontinuities and size of voids within PE cables to such an extent that advantage can no longer be taken of this positive characteristic.