

Insulation & Sheath Material Options

Polyvinyl Chloride (PVC)

PVC is the most widely used material throughout the cable industry because of its good mechanical and electrical properties, combined with cheap cost. The three most common materials used are PVC (-20°C to 80°C), PVC 105°C (-20°C to 105°C), PVC AF which is flame retardant (oxygen index > 32% and halogen content < 18%.)

Polyethylene (PE)

PE has excellent insulation characteristics and is used for data and RF transmission. It is very resistant to water penetration and thus used as sheath for outdoor/underground cables. It has three major types. ie. Low, (LDPE) medium (MDPE) and high (HDPE). Generally speaking, the higher the density, the better the mechanical performance. Cellular polyethylene has even lower capacitance than solid PE and is used for low loss data cable.

Nylon (PA)

Nylon has excellent abrasion and chemical resistance and is an excellent sheathing material. It is however, less flexible than other materials.

Fluoropolymer (PTFE/FEP/ETFE)

The three most common materials used are polytetrafluorethylene (PTFE) (-80°C to 260°C), fluorethylene-propylene (FEP) (-80°C to 205°C) and ethylenetetrafluorethylene (ETFE) (-80°C to 155°C)

These materials are usually used in aerospace industry where wide temperature range is required.

Low Smoke Halogen Free (LSHF)

It is a flame retardant compound designed to reduce both the spread of fire and the volume of toxic gas and smoke during a fire. It is usually used in Mass Transit Railway, banking and high rise building.

Low Smoke and Fume (LSF)

These materials differ from the LSHF materials in their fire retardancy and gas emission characteristics. In general, these materials are graded by their hydrogen chloride emission characteristics usually between 5 per cent and 15 percent emissions for the LSF materials as compared to 0.5 per cent for the LSHF materials.

Elastomeric Compound

They have excellent thermal stability and also makes the cable flexible. The most common material are EPR and XLPE. Both of them are used for insulation material in low and medium voltage cables.

Polypropylene (PP)

It exhibits same electrical characteristics of PE but has better mechanical and temperature properties. It is usually used for small cables with thin sheath and overall diameter.

UV Stabiliser

With the inclusion of UV Stabiliser such as carbon black compound in the formulation, PE exhibits extremely good aging properties and high UV and weather resistance whereas PVC or LSHF have improved resistance to degradation from exposure to UV radiation.