



## **PVC Cables in contact with polystyrene and polyurethane insulating materials**

Plasticiser migration from PVC cables when used in contact with polymeric insulating materials is a potential problem. Plasticisers are used in PVC to give the required physical properties such as flexibility and toughness.

**These compounds are commonly used in TPS (Tough Plastic Sheathed) Power cables, Cat5 & Cat6 data cables and B20 and B95 data cables.**

Plasticisers are typically non volatile, high boiling point liquids which are absorbed into the PVC matrix at elevated temperatures during the compounding process. Plasticisers are not chemically bonded to the PVC compound and under certain conditions can be extracted from the compound.

Commonly used PVC plasticisers tend to exhibit solubility in polystyrene and polyurethane insulating materials. As a result of this there will be migration of plasticiser from the PVC compound where there is a direct contact between the two materials, this causes the PVC on the cable to become harder and more brittle. There is also potential for plasticiser migration into bituminised building paper, causing the bitumen to soften and flow.

General Cable also manufactures TPS cables which utilise a PVC compound containing a **non migratory** plasticiser, this will not migrate from the PVC when in contact with polystyrene or polyurethane insulating materials, [click here to link to data sheet for non migratory TPS cable](#).

The rate of plasticiser migration is determined by many factors but is strongly affected by the contact area between the cable and the thermal insulating material. The migration process would be expected to occur over a relatively long time frame, there is anecdotal evidence that rapid migration can occur in polystyrene block houses, portable buildings and chillers. This is due mainly to the large contact area between the insulating material and the cable.

The service life of PVC insulated and sheathed cables in the above situation are dependent upon the conditions of exposure and many years may elapse before noticeable deterioration of the PVC occurs. However, cable lifetime could be significantly effected.

When using cables without non migratory plasticiser it is recommended that there be no direct contact between the cable and the polystyrene, this can be achieved by installing in a suitable conduit, leaving an air gap or using a polyethylene or polypropylene tape between the cable and the insulation.

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Diagrams of cables are illustrative only and not to scale

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