

## Strand-Fill in Medium Voltage Tape Shield Cable

### What is it?

Strand-fill sometimes called moisture-block is a tar like substance that is applied between each layer of a concentric stranded copper or aluminum phase conductor. During the stranding process and at slightly elevated temperatures this tar like substance becomes fluid enough to be forced through a pump and applied geometrically in such a manner that the interstitial space between every strand is filled with the tar. The tar is then allowed to cool whereas it becomes stable and remains in place.

### Why Used?

It has been well know that the presence of water in a conductor can accelerate the formation of electrical trees in regions where voids or protrusions are present between the conductor shield and insulation. The application of strand-fill into the interstitial space of every strand-layer prevents the ingress of any moisture into the conductor from the outside environment in case of a fault, digin or during terminating and splicing.

### Benefit of Use

Some utilities use strand-fill for underground residential development "URD" cables that are constructed with encapsulated concentric neutrals and used in direct burial applications. When a URD cable fails water can ingress and travel along the length of the cable strands through the puncture hole formed from the energy of the blow out. Strand-fill seals the strands to prevent the ingress of water when a cable experiences a fault, dig-in or during terminating and splicing operation.

### Unnecessary Expense

In some cases strand-fill is specified for medium voltage cables that are constructed with a tape shield and used in conduit or duct in industrial, institutional and commercial projects. Such specification adds cost and lead-time with no benefit in cable longevity, reliability or safety. Unlike direct burial applications where a cable failure is spliced into, a cable that fails in a conduit or duct has to be pulled out and replaced with a new cable negating the benefits of strand-fill. Another reason not to use strand-fill on tape shielded cables is that water can easily travel along the length of the cable at the jacket and metal tape shield interface (remember strand fill is only applied to the phase conductor strands). This is not the case with URD cables where the concentric neutrals are encapsulated into the overall jacket.

### Conclusion

Strand-fill is a good feature for URD cables that are direct buried to prevent water ingress into the strands and migration along the cable length. However, strand-fill is of no benefit on medium voltage tape shielded cables used in conduit or duct where the faulted cable is pulled out and replaced with a new one. Strand-fill does add cost; longer lead-times and normally requires minimum production run lengths.

