B.5.5. Advantages of hot melt adhesives for overlap bonding and sealing in power cables

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Abstract
If power cables are designed with aluminium or copper shields, the overlap seam has to be sealed by an adhesive. Because of the potential movements of the overlap as a result of temperature changing, only an adhesive with a high viscous liquid like behaviour at high temperatures shows well balanced properties. The main properties of hot melt adhesives blend based on polyamide PA, ethylene-vinylacetate-copolymer EVA, atactic polypropylene APP and thermoplastic elastomers TPE are compared.

Figure 2: Possible movements of the overlap ($\Delta T = 70 \, K$).

Concerning to this movement it is difficult to find an adhesive which works close to this behaviour.

There are some possible solutions to get a sealed overlap.

Option 1: Use of a sealant with high elastic behaviour (e.g. rubber mastic).
- Not enough adhesion to the substrate.

Option 2: Use of an adhesive with high structural bonding (e.g. epoxy system).
- Not enough movement of the overlap possible.

Option 3: Use of an adhesive with viscoelastic behaviour (e.g. hot melt adhesive).
- Enough adhesion to the substrate.
- Movement of the overlap possible.