Silcat* VS-963
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Description
Silcat VS-963 silane is a fully stabilized crosslinking system (silane, peroxide, catalyst, antioxidants and metal deactivator) for the manufacture of crosslinked polyethylene LV & MV cables using the Monosil\(^{(1)}\) one-step process. It provides excellent performance on equipment designed Monosil technology.

(1) Maillefer SA and BICC Ltd.

Key Features and Benefits

- Silcat VS-963 silane can be used with a wide range of non-stabilized polyethylene grades for optimum cost-effectiveness.
- With an appropriate resin, insulated copper cables crosslinked with Silcat VS-963 silane can meet the IEC aging test of 7 days at 135°C.
- A high onset temperature for grafting improves process stability and minimizes pregrafted/crosslinked particles in the insulation layer.

Typical Physical Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Clear liquid</td>
</tr>
<tr>
<td>Color</td>
<td>Light yellow</td>
</tr>
<tr>
<td>Viscosity, mPa s (cP), @ 23°C(^{(2)})</td>
<td>3.6</td>
</tr>
<tr>
<td>Specific Gravity, g/cm³, @ 23°C</td>
<td>0.976</td>
</tr>
<tr>
<td>Flash Point, Tag Closed Cup, ASTM D56-79, °C (°F)</td>
<td>25</td>
</tr>
</tbody>
</table>

(2) Brookfield LV/60rpm
Potential Applications
Low- and medium-voltage power cables.

Patent Status
Standard copy to come

Product Safety, Handling and Storage
Standard copy to come

Processing Recommendations

Performance
Moisture-cured cables produced with Silcat VS-735/1 silane by the Monosil\(^{(1)}\) process can meet the IEC 502 cable specification.

Recommended Resins
Silcat VS-963 silane can only be used with non-stabilized polyethylene resins. Recommended types are:

<table>
<thead>
<tr>
<th>Resin Type</th>
<th>Melt Index (190^\circ\text{C}/2.16\text{ kg})</th>
<th>Density</th>
</tr>
</thead>
<tbody>
<tr>
<td>LDPE resin:</td>
<td>0.2 to 0.5 g/10 min.</td>
<td>0.915 to 0.935 g/cm(^3)</td>
</tr>
<tr>
<td>LLDPE resin:</td>
<td>2 to 6 g/10 min.</td>
<td>0.915 to 0.935 g/cm(^3)</td>
</tr>
</tbody>
</table>

\(^{(1)}\) Maillefer SA and BICC Ltd.

Processing

Moisture content of the PE resin must be less than 200 ppm. In hot and humid countries pre-drying of the resin at 70°C by means of an air dessicator is highly recommended. Grafting: Optimum addition levels for a given application must be determined experimentally. Data collected on Nextrom extruders indicate that the dose levels of Silcat VS-963 silane should be between 1.3 and 2.0 wt %.
Temperature profile setting of the extruder:

<table>
<thead>
<tr>
<th></th>
<th>Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Barrel</strong></td>
<td>150/150/150/170/190/200/210°C</td>
</tr>
<tr>
<td><strong>Head and die</strong></td>
<td>210°C</td>
</tr>
<tr>
<td><strong>Screw</strong></td>
<td>80 to 100°C</td>
</tr>
</tbody>
</table>

**Crosslinking:** Rate of cure is dependent upon time, temperature and thickness of the layer and available moisture. Sufficient crosslinking can be achieved by any of the following methods:
- Immersion in water at 80-90°C, or
- Exposure to low pressure steam at 105°C, or
- Exposure to steam at atmospheric pressure (i.e. a sauna at 100°C)

**Limitations**
Standard copy to come

**Contact Information**
For product prices, availability, or order placement, contact our customer service at Momentive.com/CustomerService/

For literature and technical assistance, visit our website at: www.momentive.com

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