

## Silcat™ VS-963

### Silcat\* VS-963

#### 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<sup>(1)</sup> 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

Appearance	Clear liquid
Color	Light yellow
Viscosity, mPa s (cP), @ 23°C <sup>(2)</sup>	3.6
Specific Gravity, g/cm <sup>3</sup> , @ 23°C	0.976
Flash Point, Tag Closed Cup, ASTM D56-79, °C (°F)	25

(2) Brookfield LV/60rpm

### Potential Applications

Low- and medium-voltage power cables.

### Patent Status

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### Product Safety, Handling and Storage

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### Processing Recommendations

#### Performance

Moisture-cured cables produced with Silcat VS-735/1 silane by the Monosil<sup>(1)</sup> 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:

LDPE resin:

- Melt index(190°C/2.16 kg)	0.2 to 0.5 g/10 min.
- Density	0.915 to 0.935 g/cm <sup>3</sup>

LLDPE resin:

- Melt index(190°C/2.16 kg)	2 to 6 g/10 min.
- Density	0.915 to 0.935 g/cm <sup>3</sup>

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### 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:

- Barrel	150/150/150/170/190/200/210°C
- Head and die	210°C
- Screw	80 to 100°C

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**

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