Technical Data Sheet

Silcat™ VS-758-0

Silcat* VS-758-0

Description

Silcat VS-758/0 silane is a crosslinking system (silane, peroxide and catalyst) specially developed for the Monosil^(1) one-step process manufacture of HDPE pressure pipes that meet food regulations.

This system allows for cost-effective production of moisture crosslinkable high-density polyethylene (HDPE) pipe.

(1) Maillefer SA and BICC Ltd.

Key Features and Benefits

- Pipes manufactured using this technology show excellent mechanical properties, outstanding chemical resistance and can operate at temperatures up to 110°C
- Special stabilizers prevent premature polymerization of the grafting agent and provide excellent aging properties of cross-linked polyethylene
- High quality surface finish of pipes results from use of the fully quality-controlled Silcat system

Typical Physical Properties

Appearance	Clear liquid
Color	Colorless to straw
Viscosity, mPa s (cP), @ 23°C(2)	2.5
Specific Gravity, g/cm3, @ 25°C	0.969
Flash Point, Tag Closed Cup, ASTM D56-79, °C	23

(2) Brookfield LV/60rpm

Potential Applications

- Under-floor heating
- Hot water pipes for radiators
- Sanitary and drinking water distribution

Processing Recommendations

High density polyethylene pipes crosslinked with Silcat VS-758/0 silane masterbatch can meet following specifications:

– DIN 16892 (Rohre aus vernetztem Polyethylen)
– EN (155 WI 023)

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 desiccator 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 are as follows:

Silcat VS-758/0 silane	1.8 to 2.2%

Temperature profile setting of the extruder:

Barrel	170/180/185/195/210/220°C
Head/die	220°C
Screw	140°C

Crosslinking: The rate of cure is dependent upon time, temperature and thickness of the layer and available moisture. A crosslinking degree of 65% (gel content) can be achieved by any of the following methods:

- immersion in water at 80-90°C

- exposure to low pressure steam at 105°C
- exposure to steam at atmospheric pressure (i.e. a sauna at 100°C)

Characteristics

The component is designed to be extruded with HDPE resin in a single step and consist of:

a) Silcat VS-758/0 silane is a proprietary crosslinking system providing a stable grafting process and high crosslink density of the cured pipe.

Recommended Resins

Type of HDPE resin	Recommended	Best Performance
Melt index (190°C/2.16 kg) g/10 min	0.2 - 8	6-8
Density g/cm^3	0.945 - 0.955	0.950

Food Contact Regulations

The silane component in Silcat VS-758/0 silane is listed with ref PM nr 26328 in the EU Directive 90/128/EEC on plastics for use as food contact, with a maximum permitted quantity of ‘residual’ silane of 5 mg/kg (QM = maximum permitted quantity of the ‘residual’ substance in the food product).

The peroxide initiators are not regulated on a EU level. They are regulated at the country level.

A European reference for the peroxide ingredients are the German BgVV, Section XLVI, that allows these ingredients for food-contact applications in X-linked PE, with the restriction that the total amount of decomposition products in the final resin/product does not exceed 0.2%.

The contained catalyst is allowed under the German KTW-recommendation 1.3.17 when the migration of the Sn in drinking water is lower than 5 microgram Sn/dm2. The max concentration of Sn in the PE should be > 0.08 %.

Therefore, all components of Silcat VS-758/0 silane are allowed as ingredients in

plastics for drinking water use in Germany.

Patent Status
Standard copy to come

Product Safety, Handling and Storage
Standard copy to come

Limitations
Standard copy to come

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