

TECHNICAL INFORMATION

GRAFTED HALOGEN FREE, FLAME RETARDANT AND LOW SMOKE EMISSION
COMPOUND, CURABLE BY EXPOSURE TO MOISTURE
FOR SOLAR CABLE INSULATION

Description

This product is a LSFOH silane grafted compound for cable insulation, **Cross-linkable** by heat and moisture by previous addition of a suitable catalyst masterbatch (SIOPLAS method). It is highly recommended to store separately the grafted compound and the catalyst, as prescorching may take place during the reactive extrusion.

The properties of this compound meet the requirements of EN 50363-0 type G9 & G10, CENELEC HD 22.1S2 type EI5, BS 7211 type EI5, VDE 0207 part 23 type HJ1, VDE 0266 type HX11, TUV2pfg1169-082007solar inulation

Technical characteristics of the silane grafted compound:

Property	Test method	Unit	Typical Value
Density	ISO R 1183	gr/cm ³	1.49
Hardness at 15"	ISO R 868	Shore D	49
Tensile strength	ISO R 527	N/mm ²	13.0
Elongation at break	ISO R 527	%	220
Oxygen Index	ISO 4589	% O ₂	32
Melt Flow Index (150°C/21.6Kg)	ISO 1133	gr/10 min	4.0
Volume resistivity 20 °C (Alternating Polarity Method)	ASTM D257 Electrodes	Ωcm	4 x 10 ¹⁵
HCl & HBr gas evolution	EN 50267-2-1	%	< 0.5

The typical values reported in the table, have been obtained from measurements made on granules, extruded samples or pressed plates

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Processing

The grafted silane compound is dry blended in a separate step with a crosslinking catalyst master batch (4-6% CAT 100, CAT 105 or CAT 111 with medium reactivity or 2-3% CAT 103 or CAT 107 with high reactivity), in a traditional single screw extrusion process. A temperature profile for the reactive extrusion is given below, are however indicative, and may depend on the equipment design used.

A general rule-of-thumb for processing silane grafted compounds with the catalyst masterbatch, is that the faster the material is extruded or molded the better the results will be. Time at temperature should be kept to a minimum to avoid processing issues such as prescorching.

Zone 1	Zone 2	Zone 3	Zone 4	Collar	Head	Die
130	140	145	155	155	160	165

The extrudate is most of the time cooled down at ambient conditions or into a water bath, which provides the moisture necessary for crosslinking. The reaction is fast but diffusion of moisture in the material is a limiting factor. For this reason, hot water bath or low pressure steam autoclave can be used to speed up crosslinking. Generally speaking curing time is insulation thickness dependant, for example a 1mm wall section may take 4-6 hours in extreme moisture conditions. In case of self curing, time depends on the specific ambient temperature and humidity.

Technical characteristics after the crosslinking process:

Property	Test method	Unit	Typical Value
Tensile strength	IEC 60811	N/mm ²	14.0
Elongation at break	IEC 60811	%	210
Water absorption 24 hrs at 100 °C	IEC 60811	mg/cm ²	1,5
Hot set test 200 °C, 15mins, 0.2 N/mm ² <i>Elongation under load</i>	IEC 60811	%	20
<i>Permanent elongation after cooling</i>		%	0
Hot set test 250 °C, 15mins, 0.2 N/mm ² <i>Elongation under load</i>	IEC 60811	%	30
<i>Permanent elongation after cooling</i>		%	5
Knife penetration test at 140 °C, k = 0,6	IEC 60811	%	< 50
Volume resistivity 20 °C (Alternating Polarity Method)	ASTM D257 Electrodes	Ωcm	1 x 10 ¹⁵

The typical values reported in the table have been obtained from measurements made on extruded samples or pressed plates

Storage

The grafted compound must be stored at ambient temperature (not exceeding 30 °C) in moisture resistant bags, in order to avoid exposure to sunlight and water absorption. The crosslinkable product should be used within 4-5 hours after the bags are opened and no after the sixth month from the date of production.

Packaging

HAX HFX 509 is available in 25 Kg or bigger aluminum bags.

Our technical service is at your disposal, for further information and assistance.

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