

TECHNICAL INFORMATION



HFX 515HM

January 2020

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

Description

This product is a LSFOH silane grafted compound for cable insulation and sheating, 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 VDE 0266 type HX11 & HXM1, EN 50363-0 type G9-G10(G18) & M2(M18), VDE 0207 part 23 type HJ1, IEC 60092-360 type HF 90, EN 50363-5 type EI5, CEI 20-91 type G21-M21, IEC 62930-EN50618-TUV2pfg1169-082007 solar insulation and sheath.

Technical characteristics

Property	Test method	Unit	Typical Value
Density	ISO 1183	g/cm ³	1.42
Hardness at 15"	ISO 868	Shore D	46
Tensile strength	ISO 527	N/mm ²	11.5
Elongation at break	ISO 527	%	280
Oxygen Index	ISO 4589	% O ₂	33
Melt Flow Index (150 °C/21.6Kg)	ISO 1133	g/10 min	4.5
Volume Resistivity 20 °C (Alternating Polarity Method)	ASTM D257 Electrodes	Ω·cm	1 · 10 ¹⁶
Emission of Halogenidric acids	EN 50267-2-1/IEC 60754-1	%	< 0.5
HF gas evolution	EN 60684-2/ IEC 60754-1	%	< 0.1
pH	EN 50267-2-2/IEC 60754-2		> 4.3
Conductivity	EN 50267-2-2/IEC 60754-2	μS/mm	< 2.5
Optical density of smoke	EN 61034-2	% trasmittance	> 80
Toxicity Index	EN 50305		< 2

The typical values reported in the table have been obtained from measurements made on 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 **2-3% CAT 115/1, 3-4% CAT 119LS or 5-7% CAT 113/UV**, 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
120 - 140	120 - 140	130 - 150	130 - 150	130 - 150	130 - 150	150 - 180

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 sauna can be used to speed up crosslinking. 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	ISO 527	N/mm ²	13.0
Elongation at break	ISO 527	%	250
Water absorption 24 hrs at 100 °C	IEC 60811	mg/cm ²	< 5
Hot set test 250 °C, 15mins, 0.2 N/mm ²	IEC 60811		
Elongation under load		%	20
Permanent elongation after cooling		%	0
Shrinkage 1h at 120 °C	IEC 60811	%	< 2
Hot Pressure Test at 100 °C, k = 1.0	IEC 60811	%	< 50

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Storage

The thermoplastic compound must be stored at ambient temperature (not exceeding 30°C) in closed and unbroken bags, in order to avoid exposure to sunlight and moisture. Long stocking time may negatively affect the quality of the material. Therefore it shall be used within 6 months from the compounding date and within a few hours if the bags are opened. It is recommended to store separately the grafted compound and the catalyst, and mix just before use.

Packaging

Available in 25 Kg aluminium bags or aluminium big bags of 1250 Kg on wooden pallet.

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

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