

Self-crosslinking Silane XLPE Compound of Sioplas Method for Wire and Cable up to 3kV

1. Product Description

This product suitable for 3kV and below low-voltage wire and cable insulation. It is consisted of compound A and compound B which can be quickly cross-linked in water bath or self-crosslinking through exposure to the air after a certain time.

2. Specification

Performance test is according to the 10437-2004 JB/T standard, the cable after warm water cross-linked in line with 60502-2004 IEC, GB/T12706-2002.

3. Performance

Item	Unit	Insulation compound		Aerial cable compound	
		Mean value	Typical value	Mean value	Typical value
Tensile strength	MPa	≥13.5	22	≥13.0	22
Elongation at break	%	≥350	550	≥300	540
Air drying oven after thermal aging (°C×h)					
Variation of tensile strength	%	MAX±20	+14	MAX±20	+14
Variation of elongation at break	%	MAX±20	-7	MAX±20	-9
Hot set (200°C, 0.2 MPa, 15min)	%	≤100	75	≤175	100
Permanent deformation	%	≤5	0	≤15	5
Resistance to environmental stress cracking	h	—	—	≥1000	>1000
The temperature of low temperature impact	°C	-76°C	PASS	-76°C	PASS
Volume resistivity@20°C	Ω•m	≥1.0×10 ¹⁴	2.4×10 ¹⁴	≥5.0×10 ¹³	1.5×10 ¹⁴
Dielectric strength	MV/m	≥25	33	≥22	32
Dielectric constant	—	≤2.35	2.2	≤2.35	2.3
Dielectric loss tangent	—	≤1×10 ⁻³	5×10 ⁻⁴	≤1×10 ⁻³	5×10 ⁻⁴
Artificial weathering					
Aging time: 0~1008h					
Variation of tensile strength	%	—	—	MAX±30	+20
Variation of elongation at break	%	—	—	MAX±30	-18
Aging time: 504~1008h					
Variation of tensile strength	%	—	—	MAX±15	+10
Variation of elongation at break	%	—	—	MAX±15	-9

4. Extrusion Process

4.1 Reference extrusion equipment

Single screw extruder with the length diameter ratio 20/1 above, compression ratio of 2.5~3.0 for production; Recommend to use extrusion die or semi-extrusion die, if use tube extruding die, the material extrusion ratio should not be more than 1.5;

It is recommended to add a layer of 40 or 60 stainless steel mesh. If the system is clean and can not be filtered.

4.2 Reference processing temperature(°C)

Section	Section I	Section II	Section III	Section IV	Model Section
Temperature (°C)	160±10	180±10	190±5	200±5	220±10

4.3 Reference using steps

Ensure that the screw barrel is thoroughly cleaned and free of any remaining material;

Let the melt directly discharge from the die. Measure the temperature of melt. It should reach or greater than 200°C;

Stop then install and adjust die;

Get the conductor connected with the spool;

Start the screw, let the melt flow out slowly, then speed up the pace of traction slowly until the set requirements.

4.4 Reference cross-linking conditions

For general cable insulation layer (1 mm in thickness) can be cross-linked after bathed in 90°C above hot water for 4 hours. If the thickness of insulation is larger, it should be appropriate to extend the bath time. Extended by 1mm/4h or extend the time according to the specific heat for extended data.

4.5 Other matters needing attention

Recommend to use gas burner flame in the extrusion die to eliminate the die casting material so that can have a better extrusion surface;

If you want to add color masterbatch, it should be dried in the 65 ± 5 °C for 4 hours before the production, to ensure it added in the dry state. The proportion of materials and color masterbatch would be 100:1. The user can also increase or decrease according to their needs;

Before use, the product can not be processed by heat drying;

This product should be used up as soon as possible after opening the bag to avoid pre cross-linking;

If there will be a brief shutdown (generally in 1 hour or less) of the production due to the replacement of the mold, there is no need of cleaning the residual silane material on the machine screw and barrel, just follow the general steps to empty the material until the surface is clean, then can produce on the line; if it will be shut down for a long time, recommend to empty all the silane materials on the extrusion first and then shutdown.

5. Cross-linking Speed

The cross linking speed of the material is closely related to the thickness of insulation layer, environment temperature, environment humidity and coil size.

The smaller the thickness of the insulation layer and the smaller size, the higher the ambient temperature, the greater the humidity, the shorter the time required for cross-linking.

In the cold and dry winter, the natural cross-linking speed is relatively slow, in order to shorten the cross-linking time, can be sprayed on the surface of the insulation layer of hot water to speed up the cross-linking.

Insulation thickness	23°C、Humidity 75%	35°C、Humidity 60%	90°C In the water
0.9 mm	4-5 days	2-3 days	<30min
1.4 mm	5-7 days	3-4days	<60min
1.8 mm	8-10 days	5-7days	<90min

Note: the above data according to the A:B=95:5 after mixing evenly, using the squeeze film method, double exposure, measured in constant temperature and humidity box; the above data and the actual cable of the cross-linking rate may vary.

6. Packaging, transportation and storage

Packing: 25kg of each bag in moisture resistant aluminum laminated bags with composite paper bags outside;

Transportation and storage: cable material should not be exposed to the sun and rain during transportation. Should be stored in a clean, cool, dry, ventilated warehouse.