



Kkalpana Industries (India) Limited

An ISO 9001:2015 company
TECHNICAL DATA

Two Component Ambient Curable Polyethylene

Compound for Insulation of Aerial Bunched Cable :

KI – XL – 03 / 04 ABC - SC

DESCRIPTION:

KI-XL-03 is a superior grade of silane grafted polyethylene compound. It is designed to be used as insulation of low voltage aerial bunched cable. An enriched additive package makes it highly scorch retardant and protects it against heavy metal induced degradation.

KI-XL-03 is to be used in conjunction with catalyst master batch KI-XL-04 ABC-SC, which contains a catalyst to enhance the process of cross-linking in ambient conditions, (no need of sauna, CV tube, steam bath) and a suitable grade of carbon black to impart UV resistance.

The shelf life of KI-XL-03 and KI-XL-04 ABC-SC are indicated at the end of this brochure. However when mixed, extruded and exposed to ambient condition, cross-linking takes place immediately. The components are therefore to be mixed just before consumption, usually in the ratio of 93 parts of KI-XL-03 to 7 parts of Catalyst Master Batch (KI-XL-04 ABC-SC).

The above two components can be extruded in a normal thermoplastic conventional PE (or even PVC) extrusion line. In this case, time of curing is dependent on thickness of insulation, concentration of catalyst and ambient temperature / humidity.

SPECIFICATIONS:

KI-XL-03 & XL-04 ABC-SC meets requirements as applicable under following standards, when processed using sound extrusion practice and testing procedure;

- IS-7098 Part 1 / IS 10810
- BS 5467, 5468, 6724, 7655
- IEC 60502

TYPICAL PROPERTIES:

A) KI-XL-03

| Property | Unit | Typical Value | Test Method |
|----------------------------------|---------------------|---------------|---------------------------|
| Density | gm /cm ³ | 0.923 – 0.925 | ASTM-D-792 |
| Melt Flow Index (190°C, 2.16 Kg) | gm /10 Min | 0.6 – 2.0 | IS-10810 / ASTM-D-1238 |
| Contamination (Visual) | No./Kg | < 5 | Internal (KIIL) |

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B) XL-03 / XL-04ABC-SC

KI-XL-03 and KI-XL-04 ABC-SC are mixed at 93:7 ratio and a tape of 1.0 mm thickness is extruded. Extruded tape is kept in ambient condition (Temp. 27-30°C, humidity 60-70%) for 48 hrs for cross linking.

| Property | Unit | Typical Value | Test Method |
|-------------------------------------|--------|--------------------|-------------------------------------|
| Tensile Strength | MPa | 16 - 19 | IS-10810 (Part-7) ASTM D-638 |
| Elongation at break | % | 500 – 600 | IS-10810 Part-7 ASTM D-638 |
| Hot set at 200 °C | | | |
| a) Hot Elongation after 15 min. | % | 60 – 90 | IS-10810 Part-30 / IEC 60811-507 |
| b) Permanent Set after 5 min | % | ± 5 | -- do -- |
| Oven ageing at 135 °C, 168 hours | | | |
| a) Variation in Tensile Strength | % | ± 15 | IS-10810 Part-11 / IEC 60811-401 |
| b) Variation in Elongation at Break | % | ± 15 | -- do -- |
| Carbon content | % | 2.5 ± 0.5 | ASTM D-1063 |
| Volume Resistivity @ 25°C | Ohm-cm | 1×10^{16} | ASTM D-257 |

Cross Linking with KI-XL-04 ABC-SC

The time required for the desired cross-linking of the insulation usually depends on the following factors:

- Insulation thickness
- Catalyst concentration
- Temperature
- Relative Humidity

Spraying Water to the Cable core drum may further reduce curing time.

| Relative humidity % | Temperature °C | Insulation Thickness mm | Time to reach 100% hot elongation, days |
|---------------------|----------------|-------------------------|---|
| 60 – 70 | 27 | 0.7 | 1 |
| 60 – 70 | 27 | 1.0 | 2 |
| 60 – 70 | 27 | 1.6 | 7 |

It is evident from the above table, the grafted polymer (XL-03) and catalyst master batch (KI-XL-04ABC-SC) makes it possible to cross-link with in practical condition and acceptable time frame even at ambient conditions. In practice, the spraying to water to the cable core drum may further reduce curing time.

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PROCESSING GUIDELINES :

It is recommended to dry the Catalyst Mater batch at 60°C in air oven in 4 – 6 cm layers for 8–12 hours. The Grafted Polymer should never be pre-heated.

The Grafter Polymer and Catalyst Master Batch should not be mixed by bare hands to avoid moisture from bare hands.

It is important that extruder should not be kept idle for more than 10 minutes when filled with KI-03 / KI-XL-04 ABC-SC premix. It is needed for size change; extruder should kept running at low RPM.

PACKAGING :

- Moisture Barrier Multilayer Bags of 25 kg.
- 20' FCL will take palletized 12 MT. & 40' FCL will take 24 MT.

STORAGE :

The shelf life of the product is 90 days (In case of Export packaging the shelf life is guaranteed for 180 days instead of 90 days) from the date of production, subject to following conditions:

- Storage temperature not generally exceeding 25°C
- Away from direct sunlight and weathering.
- Closed and unbroken bags.
- Use of compound within 3-4 hours after bags are open.

The information given in the document is believed to be reliable and is given in the good faith but without warranty. The user should test the product to ascertain the suitability for the intended use. Product specification or the whole document is subject to change without any prior notice.

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