



KLJ GROUP

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TECHNICAL INFORMATION

KLJ EPR 80 / KLJ XL MB 02 SC

September 2022 Ed2

SIOPLAS CROSSLINKABLE ELASTOMER

Description:

KLJ EPR 80/KLJ XL MB 02 SC is a silane crosslinkable elastomeric compound system designed for High voltage power cables application up to 36 KV.

Cable insulation with a proper mixture of KLJ EPR 80 (95 parts) and Catalyst master batch KLJ XL MB 02 SC (5 parts) exhibits excellent thermo-oxidative stability. The combination is suitable for both copper and aluminum conductors. Sufficient antioxidant added to meet specific ageing requirements.

Application:

KLJ EPR 80 /KLJ XL MB 02 SC is designed for insulation of High voltage power cable up to 36 KV.

Specifications:

KLJ EPR 80/KLJ XL MB 02 SC, in blend meets the applicable requirements as below when processed using sound extrusion and testing procedure:

IEC-60502-2 – EPR | IS 6380 IE-2 | IS 6380 IE-1

The Sioplas compound (KLJ EPR 80 & KLJ XL MB 02 SC) to be extruded as a normal thermoplastic in a PE extrusion line for insulation and suitable semi-con compounds in semi-con extrusion lines with triple crosshead (three layers in common cross head) and longer water trough for graded cooling, thus obviating the need of an expensive continuous vulcanizing (CCV) extrusion line. The cross-linking of extruded core is subsequently carried out by immersion in hot water or exposure to steam. In both cases, time of curing is to be optimized as a function of thickness of insulation, concentration of catalyst MB and temperature of water bath or steam.

The standards referred to above is a short selection of standards and does not cover all applicable standards. Contact your KLJ representative for additional information.



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Technical Characteristics:

A) KLJ EPR 80

Properties	Unit	Test Method	Specification	Typical Value
Physical Properties				
Density	gm/cm ³	ASTM D 792	0.915- 0.925	0.92
Melt Flow Index (190°C, 2.16 kg Load)	gm/10min	ASTM D 1238	2.0 – 3.0	2.6
Contamination (Visual)	No./kg	KLJ TM	<5	0

B) KLJ EPR 80/KLJ XL MB 02 SC

Test Procedure: After mixing in proportion of 95:5 and extruded into a tape of 1.2 mm thickness, the tape is immersed in water at 95°C for 3 hours. The testing is carried out after conditioning this tape for further 3 hrs at ambient conditions.

Property	Unit	Test Method	Specification IS 6380 IE-1,2	Typical Value
Physical Properties				
Tensile Strength (min.)	MPa	IS 10810 Part-7	5	14
Elongation at Break (min.)	%	IS 10810 Part-7	250	600
Hardness	Sh-A	ASTM D 2240	82±3	82
After Ageing (168 h, 135 °C)				
Change of Tensile Properties	%	IS 10810 Part-11	±30	-10
Change of Elongation Properties	%	IS 10810 Part-11	±30	-8.2
After Ageing (168 h, 150 °C)				
Change of Tensile Properties	%	IS 10810 Part-11	±30	-12
Change of Elongation Properties	%	IS 10810 Part-11	±30	-7
Hot Set Test (250 °C, 0.20 MPa)	%	IS 18010 Part-30	175	72
Permanent Set after cooling (max.)	%	IS 18010 Part-30	15	3
Water Absorption				
(Gravimetric @ 85±2°C / 14 Days (max.))	mg/cm ²	IS 7098	5	1
Moisture Content (max.)	ppm	-	-	200
Cold Bend test @ -50°C	-	IS 10810 Part-20	No Crack	PASS
Cold Impact test @ -50°C	-	IS 10810 Part-21	No Crack	PASS

Electrical Properties

Volume Resistivity @ 27°C (min.)	Ohm-cm	IS 3396	1 x 10 ¹²	3 x 10 ¹⁶
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Dielectric Constant (max)	-	IEC-60250	2.2	1.97
Dissipation Factor (max)	-	IEC-60250	0.004	0.0003
Dielectric Strength (min)	KV/mm	IEC-60243	22	33

Processing Guidelines:

It is recommended to pre-heat the Catalyst Master Batch and Colour Master Batch (if any) at 80°C in hot air oven in 4-6 cm layers for 2-4 hours. The Grafted Polymer should never be pre-heated.

The Grafted Polymer and Catalyst Master batch should be manually mixed at a ratio 95:5 at room temperature without shearing, just before consumption. Mixing in large quantities should be avoided, since such leftover premix cannot be stored.

It is essential that extruder should not be kept idle when filled with KLJ EPR 80 / KLJ XL MB 02 SC premix. It should be kept running at a low RPM if it is needed for changeover of size etc.

Typically the following process condition is used:

Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Head	Die
140±10°C	145±10°C	155±10°C	165±10°C	175±10°C	185±10°C	195±10°C

Cross Linking:

The above extruded product can be cross linked by immersion in hot water or upon exposure to low pressure steam at a temperature of 95 to 105 °C.

Typical Cross linking data are as under.

	Thickness mm	Curing Hours	Hot Set %	Permanent Set (Max.) %
Tape Sample	3.8	9.0	130 - 140	9
		12.0	100 - 120	6
		15.0	70 - 100	4
		18.0	60 - 80	4

The time period of curing may vary case to case depending on other variables viz. cross section of cable, thickness of insulation, humidity level (Min. 50 – 60%), exposure outdoor condition, sun light, reel size and temperature etc.



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For an insulation thickness above 1.2 mm, the time needed for optimum cross-linking should be ascertained by small trial runs; bulk production should be taken up only after getting satisfactory results.

Shelf Life/Storage:

- KLJ EPR 80 can be stored for 180 from date of manufacturing, however it is suggested to use within 90 days from the date of receipt. Shelf life is subject to storage in original intact packing, in cool and dry place, away from sunlight and weathering, storage temperature not generally exceeding 35°C.
- Use the compound immediately, may be within 1 to 2 hours, of opening the bag.

Packaging:

KLJ EPR 80 (Base Grafted Compound):

Form: Granules.

Package: 25 kg aluminium multilayer bag and 600 kg Octabin with aluminium liner with Top & Bottom discharge as required by the customer.

KLJ XL MB 02 SC (Catalyst Master Batch):

Form: Granules.

Package: 25 kg aluminium multilayer bag and in smaller aluminium pouch, if required.

Safety:

This compound is not classified as dangerous preparation.

The products are supplied in the form of free-flowing granules of approx. 2-3 mm size and can be readily handled with commercially available equipment. Handling and transport of the products may generate some dust and fines, which constitute a potential hazard for dust explosion. All metal parts in the system should, therefore, be properly grounded. Properly designed equipment and good housekeeping will reduce the risk. Inhalation of any type of dust should be avoided as it may cause irritation of the respiratory system.

The product is intended for industrial use only. MSDS is available on request.

For technical service & further information and assistance:

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Disclaimer: The data given above are for the guidelines purpose only. Above compound is suitable to run on different machines; however some adjustments may be required on individual machine. All properties are tested as per ASTM/IS/IEC standards. Any



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data may change without prior information. The customers are advised to check the quality, prior to commercial use. There is no guarantee and/or warrantee what so ever, after processing.