



Super-COPOLYMER Medium-High Voltage XLPE insulation – Peroxide

• Description

ZARLNK™ XL4401 is a cross linkable natural polyethylene compound based on Super cure technology and WATER TREE RETARDANT , specially designed for insulation of power cables. The product is a polyethylene copolymer containing <2% of an ORGANIC PEROXIDE and <1% of a thermal stabilizer. No substance contained in the compound can be classified as hazardous in the stated concentrations.

Super-cure ZARLNK™ XL4401 is a ready-to-use natural compound. Super-cure ZARLNK™ XL4401 is specially developed for superior electrical performance (polymer WTR XLPE) in wet environments. It is specially developed for high productivity through faster crosslinking. It provides high cleanliness and ease of processing.

• Applications

ZARLNK™ XL4401 is intended for insulation of XLPE medium voltage (MV and HV) AC cables with rated voltages up to 72 kV.

The values are voltages between phases as defined in IEC 60183.

• Specifications

ZARLNK™ XL4401 is expected to meet the applicable requirements included in the below mentioned standards provided it is processed using sound material handling, extrusion and crosslinking practices as well as appropriate testing procedures and WATER TREE RETARDANT (WTR) . This applies up to the maximum recommended voltage level indicated in "Applications" section above since some standards cover wider voltage ranges.

IEC 60502-2	IEC 60840	DIN VDE 0276-620
VDE 0271 – 0273	GOSTR 55025-2012	UL 1072
ANSI/ICEA S-108-720	ANSI/ICEA S-93-639	AEIC CS8-00 (1st edition)
Cenelec HD 620 S2 (Part 1)	HD 620 S1, Part 1, table 2A, DIX 3 to 14	

• Special Features

ZARLNK™ XL4401 is a ready-to-use natural compound. Thanks to its inherent properties, ZARLNK™ XL4401 provides very good electrical performance. It offers excellent scorch resistance and long production runs.

ZARLNK™ XL4401 cleanliness level is assured through the Plexchem quality management system.





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• Physical Properties

Data should not be used for specification work

Property	Typical Value	Test Method
Density (Base Resin)	0.924 gr/cm ³	ISO 1183
Melt Flow Rate (190°C , 2.16 kg) Base polymer	2.8 gr/10 min	ISO 1133
Elongation at Break (250 mm/min)	>450 %	IEC 60811-401
Tensile Strength (250 mm/min)	>17 N/mm ²	IEC 60811-401
Hot set test (200°C , 20N/cm ²) Elongation under load	75%	IEC 60811-507
Permanent Elongation	5%	“
MDR , max torque	1.8 – 3.0 d.Nm	ISO 6502
Methanol Wash	< 500 ppm	Factory method
Moisture	< 200 ppm	Karl Fischer-titration
Relative Water Tree Growth (RWTG) in 90 days	7 to 8	ASTM D 6097

• Electrical Properties

Data should not be used for specification work

Property	Typical Value	Test Method
Dielectric Constant (50Hz)	2.3	IEC60250
DC Volume Resistivity (23°C)	>10 P Ohm.cm	IEC 62631
Dissipation Factor (50 Hz)	0.0003	IEC 60250
Dielectric Strength (50 Hz)	> 22 kV/mm	IEC 60243

• Processibility of Compounds

To produce a good and reliable cable, it is essential to ensure careful and very clean handling of the insulation material. Hence all material handling should preferably be conducted in closed systems and in clean room conditions.

Extruder

Recommended using a standard PE extruder with a cooling screw

Screw diameter : 120-150mm

Length of screw : 20-25 D

Screen pack : (Is necessary) : 40/60/40

Screw design : Troester or equivalent having the last 2 D as a Maddox mixing zone or with Shear –mix elements to achieve very good thermal mixing and homogenization of the melt. This is important to prevent overheating of the melt.





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XLPE Extruder									
Screw	Hopper	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Clamp	Connection
90	60	115	115	117	117	117	117	122	122
Cross Head									
Zone 1	Zone 2	Zone 3	Zone 4	Zone 5					
120	120	120	122	122					

Screw Temperature 100 (+/- 10° C) Hopper Temperature 50 (+/- 5° C)

- **NOTE:** It is important to keep the melt temperature under 135° C to avoid “scorching”

Depending on the cable type, line speeds, and outputs different melt pressures can be realized. Usual values for the melt pressure Nitrogen Pressure 9-10 bars

Tube of CV Line										
Splice box	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone6	Zone7	Zone8	Zone9	Zone10
300	400	410	390	380	370	360	350	340	330	300

- **Important Note :**
You can adjust lower temperature if your line is running at lower speed , otherwise there is risk of poor hot set and aging properties .

- **Packaging**

Package: Small Tetra-bins (500-550kg) or Tetra bins (1000 – 1500 kg)

- **Cleanness**

ZARLNK™ XL4401-WTR Cleanliness levels are assured through dual inspection of extruded tapes using separate camera systems.





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- **Storage**

ZARLNK™ XL4401-WTR has a shelf life of 24 months from production date if stored in unopened original packages, under dry and clean conditions at temperatures between 10 - 35°C (50 - 95°F).

The material can be stored at ambient temperature up to 40°C (104°F) for a period up to 6 months provided it is in unopened original packages and under dry and clean conditions. Material shelf life is affected by the storage conditions and extreme conditions influence the general material quality and performance.

Before use, material shall be conditioned indoors (production room) to reach ambient temperature. It is also recommended to ensure proper stock rotation by First In – First Out principle.