

 **Polyethylene**  
**Visico™ FR4450/LE4439**  
 Silane Crosslinkable Insulation Compound

**Description**

**Visico FR4450/LE4439** is a scorch retardant, moisture-crosslinking polyethylene compound for low voltage insulation.

**FR4450/LE4439** is a natural, zero halogen, moisture-induced crosslinking polyethylene compound that is designed for use as low voltage wire insulation and jacketing. The combination of a **VISICO FR4450** base resin, and the **LE4439** catalyst, provides a highly scorch retardant compound with excellent thermal stability and good retardant flame properties. **FR4450/LE4439** contains a patented scorch retardant additive (SRA) that increases the processing window for a moisture crosslinking compound and minimizes the tendency for premature crosslinking in the extruder, head or die.

A finished compound that is composed of 95 parts of FR4450 mixed with 5 parts of LE4439 is recognized by Underwriters Laboratories as VISICO FR4450/LE4439 95/5. FR4450/LE4439 is designed to reduce normal PE flame spread characteristics and achieve an HB-1 flame rating on 14 AWG wires and larger. LE4439 also provides, in addition to catalyst, a stabilization package containing suitable antioxidants, a metal passivator and a metal deactivator. Properly mixed, during the extrusion process, FR4450/LE4439 exhibits excellent thermal stability to oxidation.

**FR4450/LE4439** is readily pigmented to a variety of colors using standard wire & cable color concentrates designed for thermoplastic or crosslinked polyethylene.

**Application**

**FR4450/LE4439** is recommended for use as insulation and sheath for low voltage control cables and power cables up to 6kv in rating.

**Specifications**

UL 44

**Physical Properties**

Property	Typical Value	Test Method
<small>Data should not be used for specification work</small>		
Density (Visico FR4450)	1100 kg/m <sup>3</sup>	ASTM D 792
Density (LE4439)	940 kg/m <sup>3</sup>	ASTM D 792
Melt Flow Rate (190 °C/2,16 kg)	0,7 g/10min	ASTM D 1238
Tensile Strain at Break	> 300 %	ASTM D 412
Tensile Strength	15 MPa	ASTM D 412
Tensile Strength	2.350 psi	ASTM D 412
Hot Creep Test (150 °C, 0,20 MPa)	Elongation under load Permanent deformation	< 50 % < 5 %
		ICEA T-28-562

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**Electrical Properties**

Property	Typical Value	Test Method
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Dielectric constant (50 Hz)	< 3	ASTM D 150
Volume Resistivity	> 10 PΩcm	ASTM D 257
Dielectric Strength	> 22 kV/mm	ASTM D 149
Dissipation Factor	< 0,002	ASTM D 150

**Combustion Properties**

Property	Typical Value	Test Method
<small>Data should not be used for specification work</small>		
Oxygen Index	32 %	ASTM D 2863
Corrosivity of Combustion Fumes	15 μS/cm pH > 4,3	IEC 60754-2
Horizontal Flame Test (14 AWG-30 mil)	Pass	UL 44

**Processing Techniques**

Following parameters should be used as guidelines:

FR4450/LE4439 are typically mixed directly in the extruder hopper using a volumetric or gravimetric masterbatch feeder. Most equipment designed for PVC or PE extrusion is equally suitable for FR4450/LE4439.

Typically the following process conditions are used:

Barrel 1	140 °C 284 °F
Barrel 2	140 °C 284 °F
Barrel 3	150 °C 302 °F
Barrel 4	160 °C 320 °F
Barrel 6	170 °C 338 °F

**Crosslinking**

These products can be crosslinked in room temperature, by immersion in hot water or exposed to low pressure steam at a temperature up to 90% . This time period may be varied due to the humidity, thickness of insulation, reel size and temperature.

**Drying**

Unopened packages of Visico FR4450 should not require drying however if the moisture level of opened packages rises to more than 400 ppm then drying for 4 hrs at 60°C in a dehumidifying type dryer is recommended. LE4439

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should always be used from a fresh package and partially used packages resealed to prevent water ingress and potential pre-crosslinking during the extrusion step.

**Packaging**

Visico FR4450 - Base material  
Package: Smallbins  
LE4439 - Catalyst master batch  
Package: Bags  
Smallbins

**Storage**

**Visico FR4450/LE4439** has a shelf life of 12 months from delivery date if stored in unopened original packages, under dry and clean conditions at temperatures between 10 - 30 °C (50 - 85 °F).

More information on storage is found in our "Safety data sheet" / "Product safety information sheet".