



**Polyolefins**  
**VISICO™ LE4421/LE4432**  
 Scorch Retardant, Moisture-Crosslinking Polyethylene Compound  
 For Low Voltage Insulation

## Description

**LE4421/LE4432** is a black, moisture-induced crosslinking polyethylene compound that is designed for use as low voltage wire insulation and jacketing. The combination of a **VISICO™** base material, **LE4421**, and a tin catalyst masterbatch, **LE4432**, provides a highly scorch retardant compound with excellent thermal stability. **LE4421/LE4432** 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.

**LE4432** should be added to **LE4421** directly in the extruder hopper by dry blending at a ratio of 10 parts **LE4432** to 90 parts **LE4421**. **LE4432** also provides, in addition to catalyst, a stabilization package containing suitable antioxidants, a metal deactivator and a 25% loading of a fine particle size carbon black for UV weather resistance. Properly mixed, during the extrusion process, **LE4421/LE4432** exhibits excellent thermal stability to oxidation. The final insulation or jacketing will also contain 2.5% of a suitable carbon black to ensure satisfactory UV weathering stability.

## Application

**LE4421/LE4432** is recommended for use as insulation for low voltage control cables and power cables up to 6 kV in rating.

## Specifications

Cables manufactured using **VISICO™ LE4421/LE4432** and crosslinked in accordance with standard industry practices should meet the following industry cable specifications:

- Underwriters Laboratories Standard 854 for Types USE and USE-2
- Canadian Standards Association C 22.2 No. 38 Cable Type RW-90 Outdoor
- ASTM D 2655
- DIN 57 207/VDE 0207 2X11
- EC 502
- NBN C 33-321
- NFC 32-090 and 33-210

Visico is a trademark of Borealis A/S

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# Polyolefins VISICO™ LE4421/LE4432

## Physical Properties

	Typical Value <sup>(1)</sup>	Unit	Test Method <sup>(2)(3)</sup>
LE4421 Density	0.923 (923)	g/cm <sup>3</sup> (kg/m <sup>3</sup> )	ASTM D 792
LE4421 Melt Index	0.9	g/10 min	ASTM D 1238
LE4432 Density	1.05 (1050)	g/cm <sup>3</sup> (kg/m <sup>3</sup> )	ASTM D 792
Tensile Strength	2140 (15)	psi(MPa)	ASTM D 412
Ultimate Elongation	300	%	ASTM D 412
Heat Aging (7 days at 121°C)			
Tensile Strength Retention	≥90	%	ASTM D 412
Ultimate Elongation Retention	≥90	%	ASTM D 412
Hot Creep Test (150°C, 0.20 MPa)			
Elongation under load	≤50	%	ICEA T-28-562
Permanent deformation	≤5	%	ICEA T-28-562

(1) Tested in accordance with the latest issue of designated Test Methods.

(2) Data represents typical values and should not be used for specification work.

(3) These values are based on sufficient crosslinked and cured VISICO. If the VISICO has not been sufficiently crosslinked, the material will continue to crosslink during the aging process and a larger change between values before and after aging may occur.

## Electrical Properties

	Typical Value <sup>(1)</sup>	Unit	Test Method <sup>(2)</sup>
Dielectric Constant (60 Hz), 23°C	2.3	----	ASTM D 150
Dissipation Factor (60 Hz), 23°C	0.0005	----	ASTM D 150
DC Volume Resistivity	10 <sup>16</sup>	Ωcm	ASTM D 257
Dielectric Strength	>550	V/Mil	ASTM D 149



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## Processing

Most equipment designed for PVC or PE extrusion is equally suitable for **LE4421/LE4432**. Typically the following process conditions should be used as a starting point to achieve a stable extrusion process. On-size pressure or low draw down tube-on tooling is recommended for a cable having a smooth glossy appearance. Whichever type of tooling is used, however, the die should have parallel lands of a length approximately twice that of the final cable diameter.

## Equipment

Extruder Length	L/D 18-24:1
Screw Diameter	2.5 – 6 inch (65-150 mm)
Screw Compression Ratio	2.5-3.5:1
Screen Pack Mesh Size	40/80/40

	Temperature	
Barrel Zone 1	295°F	146°C
Barrel Zone 2	325°F	163°C
Barrel Zone 3	340°F	171°C
Barrel Zone 4	340°F	171°C
Head/Die Zones	350°F	177°C

## Crosslinking

**Visico** can be crosslinked in room temperature, by immersion in hot water or exposed to low pressure steam at a temperature of up to 195°F (90°C) for a period of 1 to 24 hours. This time period will be variable due to changes in the thickness of the insulation, the reel size, humidity and temperature exposure. For example, 39 mil (1.0 mm) thick insulation made from **Visico LE4421/LE4432** will crosslink in a water bath of 195°F (90°C) for a period of 2 to 6 hours giving hot set elongation of 60% (depending on conductor and reel size). **Visico** products can also be crosslinked in ambient conditions from 8 days and longer depending on relative humidity and actual temperature in which the cable is exposed.

*\*This information is supplied only as a general starting point because of the many variables which exist in the extrusion of wire and cable. For particular questions, please contact your local Borealis Compounds LLC Representative.*

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## Storage and Drying

**Visico LE4421** can be stored for up to 1 year at 50-85°F (10-30°C) in its unopened, original packages without significant deterioration in the product's properties or performance. **Visico LE4421**, under proper storage and use, does not need to be and should not be dried to avoid premature crosslinking and scorch.

**LE4432** can also be stored for up to 1 year at 50-85°F (10-30°C) in its unopened, original packages without significant deterioration in the product's properties or performance. However, it is recommended to dry **LE4432** for 4 – 8 hours at 140°F (60°C) immediately prior to extrusion.

## Delivery

### LE4432

Form Pellets  
Package 1300 lb. Box

### LE4421

Form Pellets  
Package ~~1210 lb. (550 kg) Half Octabin~~  
2200 lb. (1000 kg) Octabin; Bulk Truck or Railcar

Deleted: 1100

Deleted: 500

## Health, Safety and Environmental Considerations

A Material Safety Data Sheet (MSDS) is available for **LE4421/LE4432** and should be consulted prior to its use and handling. The product is intended for industrial use only. Please review the MSDS for more details on various aspects of safety, health, and product disposal.

## Third Party Materials

Insofar as materials not manufactured nor supplied by Borealis Compounds LLC or its subsidiary companies are used in conjunction with, or instead of Borealis Compounds LLC materials, it is the responsibility of the customer to obtain from the manufacturers or suppliers all technical data and other properties relating to these other materials and to obtain all necessary information relating to them. No liability can be accepted in respect of the use of Borealis Compounds LLC materials in conjunction with other materials.





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