Polyethylene
Visico™ME4425/LE4462

Description
Visico ME4425/LE4462 is a silane crosslinkable black compound system designed for overhead track resistant energy cables.

Visico ME4425 is a medium density polyethylene, copolymerized with vinyl silane. LE4462 is a crosslinking catalyst masterbatch specially designed to be used with Visico ME4425 to accelerate the moisture-induced reaction and impart track resistance. The system crosslinks quickly in sauna or in hot water.

Cable insulation with a proper mixture of Visico ME4425 (90 parts) and LE4462 (10 parts) exhibits excellent thermo-oxidative stability. The system can be used with copper or aluminum although overhead cables, covered conductors, is primarily aluminum conductors due to the weight saving versus copper for overhead pole cables. The use of ME4425 and LE4462 is designed to provide good weathering performance.

If a semiconductive inner layer is required, we recommend to use Borealis LE0542 together with Visico ME4425/LE4462.

Applications
Visico ME4425/LE4462 is designed as a track resistant covering for overhead energy cables with rated voltages up to 35 kV.

Specifications
Visico ME4425/LE4462 in combination meets the applicable requirements as below when processed using sound extrusion and testing procedure:

NBR 11873 / NBR 10296
ASTM D2303/ASTM D2132
IEC 60587

The standards referred to above is a selection and is not complete coverage of all applicable standards. Contact your Borealis representative for additional information.

Special Features
Visico ME4425/LE4462 insulation system offers:

Excellent processing properties
Low scorch allowing long runs and more frequent tooling changes
Excellent surface finish
Less smell, more consistent quality (no volatiles)
Good curing speed
No drying prior to extrusion
Excellent storage stability

Physical Properties

Property	Typical Value Data should not be used for specification work	Test Method
Density (mixture 90:10)	935 kg/m³	ISO 1183-1, Method A
Melt Flow Rate (190 °C/2,16 kg)	1,0 g/10min	ISO 1133
Tensile Strain at Break (250 mm/min)	> 300 %	IEC 60811-501
Tensile Strength (250 mm/min)	> 20 MPa	IEC 60811-501
Change of Tensile Properties After Ageing (240 h, 135 °C) [1]	<= 25 %	IEC 60811-401

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Brittleness temperature		< -76 °C	ASTM D 746
Environmental Stress Crack Resistance (50 °C, Igepal 10 %, F50)		> 96 h	IEC 60811-406
Hardness, Shore D (1 s)		55	ISO 868
Hot Set Test (200 °C, 0,20 MPa)	Elongation under load	60 %	IEC 60811-507
	Permanent deformation	0 %	

[1] These values are based on sufficient crosslinked/cured Visico. If Visico is not sufficiently crosslinked the material will continue to crosslink during the ageing procedure and a larger change between values before and after ageing may occur.

Electrical Properties

Property	Typical Value Data should not be used for specification work	Test Method
Dielectric constant (50 Hz)	< 2,5	IEC 60250
DC Volume Resistivity	>= 10 PΩcm	IEC 60093
Dielectric Strength	> 20 kV/mm	IEC 60243

Other properties

Property	Typical Value Data should not be used for specification work	Test Method
Track resistance	2,75 kV	NBR 10296

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Processing Techniques
Visico ME4425/LE4462 are suitable for most equipment designed for PVC/PE extrusion.

Extrusion
Temperature profile will vary depending on the extruder and screw configuration, ie, depending on the shear heat. Typically the following process conditions are used:

Barrel 1	140 - 150 °C
Barrel 2	150 - 170 °C
Barrel 3	160 - 180 °C
Barrel 4	170 - 185 °C
Die head	170 - 190 °C
Melt temperature	180 - 195 °C

The temperature of the melted polymer during extrusion should preferably not exceed 200 °C. Having the above set temperature profile, a stable extrusion process and a cable having smooth glossy appearance should be achieved. If an inner semiconductive layer is used in the cable, pressure tooling is preferable. Otherwise tube-on tooling is preferable especially with larger cables.

The use of a gradient cooling bath will improve the cable physical properties and ensure the track resistance performance of the cable.

Crosslinking
These products can be crosslinked by immersion in hot water or exposed to low pressure steam at a temperature up to 80°C. This time period may be varied due to the humidity, thickness of insulation, reel size and temperature.

Packaging
Visico ME4425 - Base material is protected from moisture ingress
Package: Bulk
Octabins
LE4462 - Catalyst master batch is protected from moisture ingress
Package: Bags

Storage
Visico ME4425/LE4462 has excellent storage stability. Visico ME4425 and LE4462 can be stored for 18 months after production, at 10-30°C (50-85°F) in unopened original packages, without significant deterioration in the quality of the material. Visico ME4425 and LE4462 should be stored in dry conditions and protected from direct sunlight. Improper storage can initiate degradation, which results in odour generation and colour changes and can have negative effects on the physical properties of this product. LE4462 is sensitive to moisture and is therefore delivered with low moisture content, ready to be used. Pre-drying is not recommended, as it will destroy the drying agent that has been added to prevent the material to take up moisture. The bags must be properly resealed between uses, as even short periods of storage in humid conditions may cause scorch during extrusion.

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Safety

Please see our "Safety data sheet" / "Product safety information sheet" for details on various aspects of safety, recovery and disposal of the product. For more information, contact your Borealis representative.

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