

## Polyethylene

# Visico™ ME4425/LE4462

## Silane Crosslinkable Compound

### 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. Visico™ LE4462 is a crosslinking catalyst masterbatch specially designed to be used with Visico ME4425 to accelerate the moisture-induced reaction and impact track resistance. The system crosslinks quickly in sauna or in hot water.

Cable insulation with a proper mixture of Visico ME4425 (90 parts) and Visico LE4462 (10 parts) exhibits excellent thermo-oxidative stability. The system can be used with aluminum for overhead cables and covered conductors. 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.

### Typical characteristics

Visico™ ME4425/LE4462 can be described with following typical characteristics:

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

### Applications

Visico™ ME4425/LE4462 is intended for following applications:

Covering/insulation of overhead cables

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 is expected to meet the applicable requirements included in the below mentioned standards provided it is processed using sound material handling and processing practices as well as appropriate testing procedures.

NBR 11873 / NBR 10296

IEC 60587

ASTM D2303/ASTM D2132

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

Visico™ is a trademark of the Borealis Group



# Polyethylene

## Visico™ ME4425/LE4462

### Physical properties

| Property                                                              | Typical value * | Unit              | Test method   |
|-----------------------------------------------------------------------|-----------------|-------------------|---------------|
| Density <sup>1</sup>                                                  | 935             | kg/m <sup>3</sup> | ISO 1183-1    |
| Melt flow rate ( 190 °C/2.16 kg) <sup>2</sup>                         | 1.00            | g/10min           | ISO 1133-1    |
| Melt flow rate ( 190 °C/2.16 kg) <sup>3</sup>                         | 10.5            | g/10min           | ASTM D1238    |
| Tensile strength ( 250 mm/min) <sup>4</sup>                           | ≥20             | MPa               | IEC 60811-501 |
| Tensile strain at break ( 250 mm/min) <sup>4</sup>                    | >300            | %                 | IEC 60811-501 |
| Change of tensile properties After ageing 135 °C, 168h <sup>5</sup>   | ≤25             | %                 | IEC 60811-401 |
| Tensile strength at break <sup>4</sup>                                | ≥2900           | psi               | ASTM D638     |
| Elongation at Break <sup>4</sup>                                      | > 300           | %                 | ASTM D638     |
| Hot set test - Permanent deformation ( 200 °C, 0.20 MPa) <sup>4</sup> | 0               | %                 | IEC 60811-507 |
| Hot set test - Elongation under load ( 200 °C, 0.20 MPa) <sup>4</sup> | 60              | %                 | IEC 60811-507 |
| Hot Creep Test ( 150°C, 29 psi) Permanent deformation <sup>4</sup>    | 0               | %                 | ICEA T-28-562 |
| Hot Creep Test ( 150°C, 29 psi) Elongation under load <sup>4</sup>    | 60              | %                 | ICEA T-28-562 |

\* Data should not be used for specification work

<sup>1</sup> (mixture 90:10)

<sup>2</sup> Base resin

<sup>3</sup> Masterbatch

<sup>4</sup> Addition of 10% Catalyst masterbatch.

<sup>5</sup> Addition of 10% Catalyst masterbatch.

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 * | Unit | Test method |
|------------------------------------------|-----------------|------|-------------|
| Dielectric constant (50 Hz) <sup>4</sup> | 2.3             | -    | IEC 60250   |
| Dielectric constant <sup>6</sup>         | 2.3             | -    | ASTM D150   |

\* Data should not be used for specification work

<sup>4</sup> Addition of 10% Catalyst masterbatch.

<sup>6</sup> 60 Hz, Addition of 10% Catalyst masterbatch.

### Other properties

| Property                      | Typical value * | Unit | Test method |
|-------------------------------|-----------------|------|-------------|
| Track resistance <sup>4</sup> | 2.75            | kV   | NBR 10296   |

\* Data should not be used for specification work

<sup>4</sup> Addition of 10% Catalyst masterbatch.

### Processing techniques

#### Extrusion:

Visico ME4425/LE4462 are suitable for most equipment designed for PVC/PE 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:

Visico™ is a trademark of the Borealis Group



## Polyethylene

### Visico™ ME4425/LE4462

| Processing setting   | Typical value/range |
|----------------------|---------------------|
| Barrel temperature 1 | 140-150 °C          |
| Barrel temperature 2 | 150-170 °C          |
| Barrel temperature 3 | 160-180 °C          |
| Barrel temperature 4 | 170-185 °C          |
| Die head temperature | 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 and storage

Visico ME4425 - Base material is protected from moisture ingress

Package: Bulk  
Octabins

Visico LE4462 - Catalyst master batch is protected from moisture ingress

Package: Bags

Visico ME4425/LE4462 has excellent storage stability. Visico ME4425 and Visico 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 Visico LE4462 should be stored in dry conditions and protected from direct sunlight. Improper storage can initiate degradation, which results in odor generation and color 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.

## Product compliance documents

Latest versions of product safety information sheets (PSIS), product safety data sheets (SDS) and other product liability documents are available in our website [www.borealisgroup.com](http://www.borealisgroup.com).

#### Disclaimer

The product(s) mentioned herein are not intended to be used for medical, pharmaceutical or healthcare applications and we do not support their use for such applications.

To the best of our knowledge, the information contained herein is accurate and reliable as of the date of publication; however we do not assume any liability whatsoever for the accuracy and completeness of such information.

Borealis makes no warranties which extend beyond the description contained herein. Nothing herein shall constitute any warranty of merchantability or fitness for a particular purpose.

It is the customer's responsibility to inspect and test our products in order to satisfy itself as to the suitability of the products for the customer's particular purpose. The customer is responsible for the appropriate, safe and legal use, processing and handling of our products.

No liability can be accepted in respect of the use of any Borealis product in conjunction with any other products and/or materials. The information contained herein relates exclusively to our products when not used in conjunction with any other material unless as specifically provided for in the test methods stated above.