

**Polyethylene**

Visico™ ME4425 / Ambicat™ LE4479

Description

Visico™ ME4425 / Ambicat™ LE4479 is a silane crosslinkable natural compound system designed for insulation of low voltage energy cables.

Visico ME4425 is a medium density polyethylene, copolymerized with vinyl silane. Ambicat LE4479 is an ambient crosslinking catalyst masterbatch specially designed to be used with Visico base resins to give reduced radial shrinkage in cables. The system is highly active and crosslinks quickly at ambient conditions, in sauna or in hot water.

Cable insulation with a proper mixture of Visico ME4425 (95 parts) and Ambicat LE4479 (5 parts) exhibits excellent thermo-oxidative stability. The combination is suitable for both copper and aluminium conductors. If the insulation is designed to meet the thermo-oxidative ageing demand required by IEC 60502 at 150°C in contact with copper, the addition of 9 parts Ambicat LE4479 to Visico ME4425 is recommended.

Applications

Visico ME4425 / Ambicat LE4479 is designed for:

Insulation of low voltage energy cables, range up to 6 kV

Specifications

Visico ME4425 / Ambicat LE4479 in combination meets the applicable requirements as below when processed using extrusion practice and testing procedure:

ASTM D 1248 Type II, Class A, Category 4
IEC 60502-1
HD 603 S1

HD 604 S1
EN 50290-2-29

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 / Ambicat LE4479 insulation system offers:

Excellent processing properties
Low scorch allowing long runs and more frequent tooling changes
Environmentally friendly (free from heavy metals)
Less smell, more consistent quality (no volatiles)

No drying prior to extrusion
Very good curing speed
Excellent surface finish
Reduced radial shrinkage
Excellent storage stability

The addition of metal soaps and basic (high pH) components, like some fillers, stearates and UV-stabilisers, will deactivate the catalyst and is not suitable together with Ambicat. To prevent deactivation of the catalyst during colouring, Ambicat compatible colour masterbatches are needed. Please contact your Borealis representatives for additional information.

Visico and Ambicat are trademarks of the Borealis group.

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Physical Properties

Property	Typical Value	Test Method
Data should not be used for specification work		
Density (mixture 95:5)	930 kg/m ³	ISO 1183-1, Method A
Melt Flow Rate (190 °C/2,16 kg) ¹	1,0 g/10min	ISO 1133
Tensile Strain at Break (250 mm/min)	> 300 %	ISO 527, EN 60811-501
Tensile Strength (250 mm/min)	> 20 MPa	ISO 527, IEC 60811-501
Change of Tensile Properties, Addition of 5 % Catalyst, after ageing (168 h, 135 °C) ²	<= 25 %	IEC 60811-401
Change of Tensile Properties, Addition of 9 % Catalyst, after ageing with Cu-conductor (168 h, 150 °C) ²	<= 30 %	IEC 60811-401
Hot Set Test (200 °C, 0,20 MPa)	Elongation under load 60 %	IEC 60811-507
	Permanent deformation <= 10 %	

¹ Base Resin² 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	Test Method
Data should not be used for specification work		
Dielectric constant (50 Hz)	< 2,3	IEC 60250



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Processing Techniques

Visico ME4425 / Ambicat LE4479 are suitable for most equipment designed for PVC/PE extrusion.

Extrusion

Typically the following process conditions are used:

Barrel 1	150 °C
Barrel 2	185 °C
Barrel 3	185 °C
Barrel 4	185 °C
Die head	185 °C
Melt temperature	190 - 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. On-size pressure or draw down tube-on tooling is preferred. The use of a gradient cooling bath will improve the cable insulation physical properties further.

Conductor preheating up to 100°C is recommended when producing cables with a conductor up to 16 mm² for good mechanical properties.

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°C. This time period may be varied due to the humidity, thickness of insulation, reel size and temperature.

Example: Visico ME4425/Ambicat LE4479. Time to reach Hot Set elongation value of 100%.

Thickness	Time	
0,7 mm	3,0 Days	23°C, 50 % humidity, in air.
0,7 mm	< 60 min	90°C, Sauna or water bath.

Packaging

Visico ME4425 - Base material is protected from moisture ingress

Package: Bulk
Octabins

Ambicat LE4479 - Catalyst master batch is protected from moisture ingress

Package: Bags

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Storage

Visico ME4425 / Ambicat LE4479 has excellent storage stability. Visico ME4425 can be stored for 18 months and Ambicat LE4479 for 12 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 / Ambicat LE4479 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. Ambicat LE4479 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.

Safety

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

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.

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