PRODUCT DATA SHEET

Polyethylene

Visico™ME4425 / Ambicat™LE4479

Silane Crosslinkable Insulation Compound

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.

Typical characteristics

Visico™ME4425 / Ambicat™LE4479 can be described with following typical characteristics:

- 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.

Applications

Visico™ME4425 / Ambicat™LE4479 is intended for following applications:

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

Specifications

Visico™ME4425 / Ambicat™LE4479 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.

- ASTM D1248 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.

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Polyethylene

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Physical properties

Property	Typical value *	Unit	Test method
Density [1]	930	kg/m³	ISO 1183-1
Melt flow rate (190 °C/2.16 kg) [2]	1.0	g/10min	ISO 1133
Tensile strain at break (250 mm/min)	>300	%	IEC 60811-501
Tensile strength (250 mm)	>20	MPa	IEC 60811-501
Change of tensile properties After ageing 135 °C, 168h [3]	≤25	%	IEC 60811-401
Change of tensile properties After ageing with Cu-conductor 150 °C, 168h [4]	≤30	%	IEC 60811-401
Hot set test - Elongation under load (200 °C, 0.20 MPa)	60	%	IEC 60811-507
Hot set test - Permanent deformation (200 °C, 0.20 MPa)	0	%	IEC 60811-507

* Data should not be used for specification work

[1] *Density (mixture 95:5).*

[2] *Base resin.*

[3] *Addition of 5% 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.

[4] *Addition of 9% Catalyst masterbatch.*
These value 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)	2.3	-	IEC 62631-2-1

* Data should not be used for specification work

Processing techniques

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

Typically the following process conditions are used:

Processing setting	Typical value/range
Barrel temperature 1	150 °C
Barrel temperature 2	185 °C
Barrel temperature 3	185 °C
Barrel temperature 4	185 °C
Die head temperature	185 °C
Melt temperature	190-195

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 mm ² for good mechanical properties.

Crosslinking:

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Polyethylene

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

Packaging and storage

Visico ME4425 - Base material is protected from moisture ingress
Package: Bulk
Octabins
Ambicat LE4479 - Catalyst master batch is protected from moisture ingress
Package: Bags

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. Once a bag of catalyst masterbatch is opened, we recommend to fully use it; otherwise, the bag 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.

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.
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