

Polyethylene

Visico™ LE4415/ Ambicat™ LE4476

Silane Crosslinkable Insulation Compound

Description

Visico™ LE4415 / Ambicat™ LE4476 is a silane crosslinkable natural compound system designed for insulation of flexible low voltage energy cables. Visico LE4415 is a low-density terpolymer comprised of polyethylene, vinyl silane and a further co-monomer defining the flexibility of the polymer.

Ambicat LE4476 is an ambient crosslinking catalyst masterbatch specially designed to be used with Visico base resins. 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 LE4415 (95 parts) and Ambicat LE4476 (5 parts) exhibits excellent thermo-oxidative stability. The combination is suitable for both copper and aluminum conductors.

Typical characteristics

Visico™ LE4415/ Ambicat™ LE4476 can be described with following typical characteristics:

Excellent processing properties

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™ LE4415/ Ambicat™ LE4476 is intended for following applications:

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

Specifications

Visico™ LE4415/ Ambicat™ LE4476 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 I, Class A, Category 4

IEC 60502-1

EN 50290-2-29

NEMA WC 70 / ICEA S-100-685

HD 603 S1

NEMA WC 71 / ICEA S-96-659

HD 604 S1

EN 50620

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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Physical properties

Property	Typical value *	Unit	Test method
Base resin density	940	kg/m ³	ISO 1183-1/Method A
MFR 190°C/2.16kg ¹	4.5	g/10 min	ISO 1133-1
Flexural modulus ²	30	MPa	ISO 178
Tensile strain at break (50 mm/min) ²	>300	%	ISO 527
Tensile strength (50 mm/min) ²	≥15	MPa	ISO 527
Change of tensile properties After ageing 135 °C, 168h ³	≤25	%	IEC 60811-401
Hot set test - Elongation under load (200 °C, 0.20 MPa) ³	35	%	IEC 60811-507
Hot set test - Permanent deformation (200 °C, 0.20 MPa) ³	1	%	IEC 60811-507

* Data should not be used for specification work

¹ Base resin

² Value applicable with the recommended amount of catalyst masterbatch and fully crosslinked.

³ 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) ²	2.8		IEC 62631

* Data should not be used for specification work

² Value applicable with the recommended amount of catalyst masterbatch and fully crosslinked.

Processing techniques

Visico LE4415 / Ambicat LE4476 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	170 °C
Barrel temperature 3	170 °C
Barrel temperature 4	170 °C
Die head temperature	170 °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.

These products can be crosslinked 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 LE4415 / Ambicat LE4476 . Time to reach Hot Set elongation value of 100% at different insulation thickness.

Thickness	Time	Condition
0,7 mm	1 day	23°C, 50% humidity, in air.
1,8 mm	2 days	23°C, 50% humidity, in air.

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Packaging and storage

Visico LE4415 - Base material is protected from moisture ingress

Package: Bags

Octabins

Ambicat LE4476 - Catalyst master batch is protected from moisture ingress

Package: Bags

Visico LE4415 / Ambicat LE4476 has excellent storage stability. Visico LE4415 can be stored for 12 months and Ambicat LE4476 for 15 months after production, at 10-30 °C (50-85 °F) in unopened original packages, without significant deterioration in the quality of the material. Visico LE4415 and Ambicat LE4476 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 LE4476 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.

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.

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