Polyethylene

Visico™LE4421 / Ambicat™LE4472

Description

Visico™LE4421 / Ambicat™LE4472 is a silane crosslinkable black compound system designed for insulation of low voltage energy cables and covering/insulation of overhead cables.

Visico LE4421 is a low density polyethylene, copolymerised with vinyl silane. Ambicat LE4472 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 LE4421 (93 parts) and Ambicat LE4472 (7 parts) exhibits excellent thermo-oxidative stability. The combination is suitable for both copper and aluminum conductors. The final product contains nominal 2,2% of fine size carbon black ensuring excellent weatherability.

Applications

Visico LE4421 / Ambicat LE4472 is designed for:

Covering/insulation of overhead cables.

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

Specifications

Visico LE4421 / Ambicat LE4472 in combination meets the applicable requirements as below when processed using sound extrusion and testing procedure:

ANSI/ICEA S-70-547
ASTM D 1248 Type II, Class C, Category 4
HD 603 S1
HD 626 S1 (TIX-2, TIX-3, TIX-4, TIX-5, TIX-6, TIX-8, TIX-9)
IEC 60502-1
NEMA WC 70/ ICEA S-100-685
NEMA WC 71/ ICEA S-96-659
NF C33-209 (Except messenger wire part 6.5 and 6.8)

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 LE4421 / Ambicat LE4472 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)
Outstanding curing speed
No drying prior to extrusion
Excellent surface finish
Excellent storage stability

Borealis AG | Wagramer Strasse 17-19 | 1220 Vienna | Austria
Telephone +43 1 224 00 0 | Fax +43 1 22 400 333
FN 269858a | CCC Commercial Court of Vienna | Website www.borealisgroup.com

Polyethylene

Visico LE4421 / Ambicat LE4472

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. Please contact your Borealis representatives for additional information.

Physical Properties

Property		Typical Value Data should not be used for specification work	Test Method
Density (mixture 93:7)		933 kg/m³	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 %	IEC 60811-501
Tensile Strength (250 mm/min)		> 15 MPa	IEC 60811-501
Change of Tensile Properties After Ageing (240 h, 150 °C) [2]		<= 25 %	IEC 60811-401
Change of Tensile Properties After UV Ageing (Between 3 and 6 weeks) [2]		<= 15 %	NF C33-209
Change of Tensile Properties After UV Ageing (After 6 weeks) [2]		<= 30 %	NF C33-209
Hot Set Test (200 °C, 0,30 MPa)	Elongation under load	30 %	IEC 60811-507
	Permanent deformation	0 %	

[1] Base Resin
[2] 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

Borealis AG | Wagramer Strasse 17-19 | 1220 Vienna | Austria
Telephone +43 1 224 00 0 | Fax +43 1 22 400 333
FN 269858a | CCC Commercial Court of Vienna | Website www.borealisgroup.com

Polyethylene

Visico LE4421 / Ambicat LE4472

Processing Techniques

Visico LE4421 / Ambicat LE4472 are suitable for most equipment designed for PVC/PE extrusion.

Extrusion

Typically the following process conditions are used:

Barrel 1	150 °C
Barrel 2	170 °C
Barrel 3	170 °C
Barrel 4	170 °C
Die head	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.

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 LE4421 / Ambicat LE4472 . Time to reach Hot Set elongation value of 100% at different insulation thickness.

Thickness	Time	
0,7 mm	1,5 Days	23°C, 50 % humidity, in air.
0,7 mm	< 15 min	90°C, Sauna or water bath.
1,8 mm	1 h	90°C, Sauna or water bath.

Packaging

Visico LE4421 - Base material is protected from moisture ingress
Package: Octabins
Smallbins
Ambicat LE4472 - Catalyst master batch is protected from moisture ingress
Package: Bags

Borealis AG | Wagramer Strasse 17-19 | 1220 Vienna | Austria
Telephone +43 1 224 00 0 | Fax +43 1 22 400 333
FN 269858a | CCC Commercial Court of Vienna | Website www.borealisgroup.com

Polyethylene

Visico LE4421 / Ambicat LE4472

Storage

Visico LE4421 / Ambicat LE4472 has excellent storage stability. Visico LE4421 can be stored for 18 months and Ambicat LE4472 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 LE4421 and Ambicat LE4472 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 LE4472 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, recovery and disposal of the product. 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.

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.

Borealis AG | Wagramer Strasse 17-19 | 1220 Vienna | Austria
Telephone +43 1 224 00 0 | Fax +43 1 22 400 333
FN 269858a | CCC Commercial Court of Vienna | Website www.borealisgroup.com