02.11.2010 Ed.7

Polyethylene

Visico™ ME4425 / Ambicat™ LE4476

Compound for silane crosslinkable cables

Description

Visico ME4425 / Ambicat LE4476 is a silane crosslinkable natural compound designed for low voltage power cables up to 6kV.

The base material Visico ME4425 in combination with the catalyst masterbatch Ambicat LE4476 will accelerate the moisture-induced crosslinking reaction. The system is highly active and crosslinks quickly at ambient conditions, in sauna or in hot water.

When properly mixed, addition of 5 parts of Ambicat LE4476 to 95 parts of Visico ME4425 , insulation with excellent thermo-oxidative stability, also in contact with copper as well as aluminium, is achieved. If the insulation is designed to meet the thermo-oxidative ageing demand requiring by IEC 60502 at 150°C in contact with copper, addition of 9 parts Ambicat LE4476 to Visico ME4425 is recommended.

Applications

Visico ME4425 / Ambicat LE4476 is designed for:

Insulation of low voltage cables for the range up to 6 kV.

Additives

Visico ME4425 / Ambicat LE4476 contains antioxidant, metal deactivator and a drying agent. Visico ME4425 contains a permanent scorch retardant additive, ensuring safe processing and enabling the use of a highly active crosslinking catalyst.

Specifications

Visico ME4425 / Ambicat LE4476 in combination meets the applicable requirements as below when processed using sound extrusion and testing procedure:

ASTM D 1248 Type I, Class A, Category 4
IEC 60502-1
HD 603 S1
HD 604 S1
NEMA WC 70
NEMA WC 71

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 LE4476 consists of specially selected components to offer:

Excellent storage stability
Excellent processing properties
No volatiles
Low scorch
Environmentally friendly (free from heavy metals)
Outstanding curing rates

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No or little die drool
No drying prior to extrusion

Excellent surface finish

The base material Visico ME4425 in combination with the catalyst masterbatch Ambicat LE4476 is a ready-made two-component system which crosslinks quickly at ambient conditions, in sauna or in hot water. Visico ME4425 is based upon a cost optimised medium density polyethylene, copolymerised with vinyl silane. The catalyst masterbatch, Ambicat LE4476 , contains a novel, patented, environmentally friendly crosslinking catalyst and is completely free from heavy metals.

Physical Properties

Property		Typical Value Data should not be used for specification work	Test Method
Density (mixture 95:5)		930 kg/m3	ISO 1872-2/ISO 1183-2
Melt Flow Rate (190 °C/2,16 kg)		1,0 g/10min	ISO 1133
Tensile Strain at Break (250 mm/min)		> 300 %	ISO 527
Tensile Strength (250 mm/min)		> 20 MPa	ISO 527
Change of Tensile Properties, Addition of 5 % Catalyst, after ageing. (240 h, 135 °C) [1]		<= 25 %	IEC 60811-1-2
Change of Tensile Properties, Addition of 9 % Catalyst, after ageing. (168 h, 150 °C) [1]		<= 30 %	IEC 60811-1-2
Brittleness temperature		< -76 °C	ASTM D 746
Environmental Stress Crack Resistance (50 °C) (Igepal 10 %), (F20)		> 96 h	IEC 60811-4-1/B
Hardness, Shore D (1 s)		55	ISO 868
Hot Set Test (200 °C, 0,20 MPa)	Elongation under load	60 %	IEC 60811-2-1
	Permanent deformation	0 %	

[1] These values are based on sufficient crosslinked/cured Visico. If Visico is sufficient 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)	< 2,3	IEC 60250
DC Volume Resistivity	> 10 POhm.cm	IEC 60093
Dielectric Strength	> 22 kV/mm	IEC 60243
Dissipation Factor (50 Hz)	< 0,0005	IEC 60250

Processing Techniques

Visico ME4425 / Ambicat LE4476 are suitable for most equipment designed for PVC/PE extrusion. The actual conditions will depend on the type of equipment used.

PVC screw or PE screw with an L/D above 20 is recommended. Use of filter (60-100 mesh) is recommended.

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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

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.

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 LE4476 . Time to reach Hot Set elongation value of 100% at different insulation thickness.

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

Packaging

Visico ME4425 - Base material
Package: Octabins
Ambicat LE4476 - Catalyst master batch
Package: Bags

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Storage

Visico ME4425 / Ambicat LE4476 is advised to be stored as follows: Visico ME4425 can be stored for 18 months and Ambicat LE4476 for 15 months after production, at 10-30 °C in unopened original packages, without significant detoriation in the quality of the material. Visico ME4425 should be stored in dry conditions at temperatures below 50 °C and protected from UV-light.
Ambicat LE4476 is sensible 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.
Addition of metal soaps and basic (high pH-) components, like some filler, stearates and UV-stabilisers, will deactivate the catalyst and is not suitable together with the Ambicat catalyst masterbatch. To prevent deactivation of the catalyst during colouring, special designed colour masterbatches are needed.

More information on storage is found in our "Safety data sheet" / "Product safety information sheet" for this product.

Safety

These products are not classified as dangerous and are intended for industrial use only. Check and follow local codes and regulations!

Please see our "Safety data sheet" / "Product safety information sheet" for details on various aspects of safety, recovery and disposal 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.

No liability can be accepted in respect of the use of Borealis' products in conjunction with other materials. The information contained herein relates exclusively to our products when not used in conjunction with any third party materials.

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