Polyethylene
HE1123

Description
HE1123

It is a high density polyethylene compound intended for the insulation of radio frequency coaxial cables. Borcell HE1123 is designed to give the lowest possible cable attenuation by the selection of electrical clean feedstock and contains limited amount of selected additives.

Borcell HE1123 is designed to be used as insulation for radio frequency coaxial cables having an extra high demand on low attenuation at high frequencies. By blending with a suitable stabilised LDPE component, such as LE1120, in an optimised ratio, prior to the extrusion, the lowest possible attenuation and good foaming properties can be achieved. Please find more information on applications below.

Applications
HE1123 is designed to use as physically foamed insulation for:

Radio frequency coaxial cables (50 Ohm)

Specifications
HE1123 meets the following material classification:

ISO 1872-PE, KGHN, 62-D090
ASTM D 1248 Type IV, Class A, Category 3

The following cable material standards are met by HE1123:

EN 50290-2-23 [1]

[1] Appropriate parts

Cables manufactured with HE1123 using sound extrusion practice normally comply with the following cable product standards:

IEC 61196
EN 50117

Special features
HE1123 consists of specially selected components to offer:

Low attenuation at high frequency
Expansion degree above 80%

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Physical Properties

Property	Typical Value Data should not be used for specification work	Test Method
Density	963 kg/m³	ISO 1872-2/ISO 1183
Melt Flow Rate (190 °C/2,16 kg)	8 g/10min	ISO 1133
Tensile Strain at Break (50 mm/min)	600 %	ISO 527-2
Tensile Strength (50 mm/min)	33 MPa	ISO 527-2
Hardness, Shore D (1 s)	64	ISO 868

Electrical Properties

Property	Typical Value Data should not be used for specification work	Test Method
Dielectric constant (1 MHz)	2,35	IEC 60250
Dielectric constant (1,9 GHz)	2,35	Borealis Method
Dissipation Factor (1 MHz)	0,00005	IEC 60250
Dissipation Factor (1,9 GHz)	0,00006	Borealis Method

Processing Techniques

HE1123 can be processed over a wide range of conditions.

Processing conditions are influenced by the construction of the gas injection system, cable size, choice of LDPE component and nucleating agent as well as HDPE/LDPE ratio.

A variety of nucleating agents can be used in combination with LE1120/HE1123.
Nucleating agent masterbatch Hydrocerol NUC 5532 from Clariant, which contains endothermic blowing agent has shown good results.

Tooling

Pressure tooling is invariably required. The die diameter is a function of the level of expansion with a greater expansion requiring a smaller die. Typically a die diameter 50% of the nominal insulation outer diameter is used.

Typical extrusion temperatures

Typical extrusion profiles for LE1120/HE1123 ratio 70/30 + 1%NUC5532:

Single extruder process:

Screw cooling	120°C
Zone 1	160°C
Zone 2	190°C
Zone 3	185°C
Gas injection	
Zone 4	145°C
Zone 5	135°C
Flange	135°C

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Adapter	135°C
Adapter	140°C
Head	130°C

Cascade Extruder process

Extruder 1:	
Entry zone cooling	35°C
Zone 1	165°C
Zone 2	185°C
Zone 3	190°C
Zone 4	195°C
Gas-injection	
Zone 5	175°C
Zone 6	165°C
Head 1	160°C
Head 2	155°C
Head 3	150°C
Head 4	150°C
Screw cooling	110°C

Extruder 2:	
Entry zone cooling	50°C
Zone 1	145°C
Zone 2	140°C
Zone 3	135°C
Zone 4	135°C
Zone 5	135°C
Zone 6	135°C
Head 1	140°C
Head 2	140°C
Head 3	140°C
Head 4	145°C
Screw cooling	75°C

Please contact your local Borealis representative for specific assistance.

Packaging

Package:	Bags
	Octabins
	Bulk

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Storage
HE1123 should be stored in dry conditions at temperatures below 50°C and protected from UV-light.

Safety
The product is not classified as dangerous.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 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.

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