



Polyethylene

FR4810

Black Low Smoke Zero Halogen Flame Retardant Jacketing Compound for Energy Cables

Description

FR4810 is a thermoplastic, low smoke zero halogen (LSZH) flame retardant, black jacketing compound combining with flexibility and exceptional fluid resistance. The composition is based on the elements Carbon, Hydrogen, Oxygen, Silicon and Magnesium. Compounds based on these elements will therefore be the only significant constituents of the combustion fumes. Other elements may be present in concentrations less than 0.1%.

Its excellent flame retardancy is achieved by an inorganic filler and a novel char-forming additive.

Applications

FR4810 is designed for:

90°C rated jacket for cables with high flame retardancy required

The high operating temperatures and durability (abrasion resistance, hardness) of **FR4810** makes it an attractive solution for energy cables installed in industrial areas, tunnels, ducts. The ability of this compound to be used for both internal and external applications is valuable as it avoids the requirement of cable splicing at building service entrances. It can be used in areas sensitive to smoke or corrosive and toxic combustion products. In general, **FR4810** has sufficient flame retardancy to satisfy bunched cable vertical burning tests.

Specifications

FR4810 meets the applicable requirements below using sound commercial extrusion practice and testing procedures:

ISO 1872-PE, KCGH, 33-D001

ASTM D 1248 Type I, Class C, Category 4

The following cable material standards are met by **FR4810**:

EN 50290-2-27
EN 50363-8 TM7

VDE 0207 Teil 24 (HM4)
BS 7655 LTS2

Cables manufactured with **FR4810** using sound extrusion practice normally comply with the following cable product standards:

IEC 60502, Part 1, Type ST3, ST8

Special Features

FR4810 consists of specially selected components to offer:

Low smoke and reduced toxic or corrosive gas emissions
Excellent processing properties
High mechanical strength and toughness

Superb system ageing compatibility
Low water permeability
UV resistance



Polyethylene
FR4810

Processability on most PVC/PE extrusion equipment

No need for pre-drying normally

Physical Properties

Property	Typical Value	Test Method
Data should not be used for specification work		
Density (Compound) ¹	1270 kg/m ³	ISO 1872-2/ISO 1183
Melt Flow Rate (190 °C/5 kg) ¹	0,7 g/10min	ISO 1133
Flexural Modulus ¹	200 MPa	ISO 178
Tensile Strain at Break ²	500 %	IEC 60811-501
Tensile Strength (50 mm/min) ²	11 MPa	IEC 60811-501
Change of Tensile Properties After Ageing (240 h, 110 °C) ²	< 20 %	IEC 60811-401
Brittleness temperature ¹	< -35 °C	ASTM D 746
Environmental Stress Crack Resistance (50 °C, Igepal 10 %, F20)	> 1.000 h	IEC 60811-406
Hardness, Shore D (15 s) ¹	43	ISO 868
Pressure Test at High Temperature (90 °C, 4 h) ²	20 %	IEC 60811-508
Water absorption (70 °C, 14 Days) ²	0,8 mg/cm ²	IEC 60811-402

¹ Compound

² Cable (0.7 mm insulation over 1.5 mm² solid Cu)

Electrical Properties

Property	Typical Value	Test Method
Data should not be used for specification work		
DC Volume Resistivity ¹	5 PΩcm	IEC 60093
Dielectric Strength ¹	> 20 kV/mm	IEC 60243

¹ Compound

Combustion Properties

Property	Typical Value	Test Method
Data should not be used for specification work		
Smoke index	15	NES 711
Toxicity index	2	NES 713
Temperature index	250 °C	ISO 4589-3
Limiting Oxygen Index ¹	35 %	ASTM D 2863
Corrosivity of Combustion Fumes	0,6 μS/mm	IEC 60754-2
VW-1 Vertical Flame Test 0,76 mm	pH 7 Pass	

¹ Compound



Polyethylene FR4810

Processing Techniques

Most equipment designed for PVC/PE extrusion is suitable.

Using the below recommended starting set temperatures, a stable extrusion process and a cable having a smooth glossy appearance can be achieved. The temperature setting could be changed depending on extruder, tooling and cable design. Recommended melt temperature of 130-150°C. FR4810 is supplied in an aluminium-lined package. Providing the package remains sealed, the material does not require drying prior to extrusion.

Barrel 1	90 °C
Barrel 2	110 °C
Barrel 3	120 °C
Barrel 4	130 °C
Die	140 °C

Packaging

Package: Octabins with Alu-liner

Storage

FR4810 normally does not need pre-drying unless the material has been stored in a moist environment for a long period.

In such cases drying in dehumidified air for 4 hours at 70°C will normally reduce the moisture content to an acceptable value.

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 of the product. For more information, contact your Borealis representative.

 **Polyethylene**
FR4810**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.