

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 energy 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 as below when processed using sound extrusion practice and testing procedure:

BS 6724
BS 7655 LTS2

VDE 0207 Teil 24 (HM4)

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
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/2,16 kg) ¹	0,1 g/10min	ISO 1133
Flexural Modulus ¹	200 MPa	ISO 178
Tensile Strain at Break ²	500 %	IEC 60811-1-1



Polyethylene FR4810

Tensile Strength (50 mm/min) ²	11 MPa	IEC 60811-1-1
Retention of Tensile Properties After Ageing (240 h, 110 °C) ²	< 20 %	IEC 60811-1-2
Brittleness temperature ¹	< -35 °C	ASTM D 746
Environmental Stress Crack Resistance (50 °C) (Igepal 10 %), (F20)	> 1.000 h	IEC 60811-4-1/B
Hardness, Shore D (15 s) ¹	48	ISO 868
Pressure Test at High Temperature (90 °C, 4 h) ²	20 %	IEC 60811-3-1
Water absorption (70 °C,14 Days) ²	0,8 mg/cm ²	IEC 60811-1-3

¹ Compound² 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	
Volume Resistivity ¹	5 POhm.cm	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
Limited Oxygen Index ¹	35 %	ASTM D 2863
Cone Calorimeter (heat flux 35 kW/m ² , 3 mm plaque)	Ignition time Average Heat Release Max Heat Release Heat Combustion Smoke Obscuration CO CO ₂	105 s 152 kW/m ² 213 kW/m ² 27 MJ/dm ³ 297 m ² /dm ³ 0,011 kg/dm ³ 1,71 kg/dm ³
VW-1 Vertical Flame Test 0,76 mm	Pass	ISO 5660

¹ Compound

Processing Techniques

Most equipment designed for PVC/PE extrusion is suitable.

Using the below set temperatures a stable extrusion process and a cable having a smooth glossy appearance can be achieved. FR4810 is supplied in an aluminium-lined package. Providing the package remains sealed, the material does not require drying prior to extrusion.



Polyethylene FR4810

Barrel 1	160 °C
Barrel 2	170 °C
Barrel 3	180 °C
Barrel 4	190 °C
Die	190 °C

Packaging

Package: Octabins
 Bags

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.

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.