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PP4821

Non-Halogen Compound for Building Wire Insulation

Description

PP4821 is a thermoplastic, non-halogen containing, insulation compound based on a polypropylene co-polymer. This material was previously called BB701W.

Applications

PP4821 can be used in areas sensitive to smoke or corrosive and toxic combustion products. It is primarily intended to be used as a building wire insulation. It is especially recommended for non-halogen “NHMH” type cables consisting of **PP4821** insulation, a suitable bedding (**EPDM**) and a flame retardant “FR” jacket (**FR4803)**.

The composition of **PP4821** is based on the elements Carbon and Hydrogen. Compounds based on these elements will therefore be the only significant constituents of the fumes due to the combustion of this product. Other elements may be present in concentrations less than 0,1%.

Specifications

PP4821 may be considered for cable applications described in the following cable specification:

- VDE 0250 Pt 215-NHMH

Physical Properties

		Typical Value*	Unit	Test Method
Compound				
Density		915	kg/m^3	ISO 1872-1/ISO 1183-D
Melt Flow Rate	(230°C 2.16 kg)	2.4	g/10min	ISO 1133
Durometer Hardness, Shore D	(15 sec)	48	-	ISO 868
Cable (0. 5mm insulation over 1.5 mm^2 solid Cu)				
Tensile Strength	(50 mm/min)	18	MPa	IEC 60811-1-1
Elongation		600	%	IEC 60811-1 -1
Change of Tensile Properties				
after ageing	(120°C, 14 d)	<20	%	IEC 60811-1-2
Pressure Test at High Temperature	(120°C, 4 h)	15	%	IEC 60811-3-1
Heat Shock	(150°C, 1 h)	Pass	-	IEC 60811-3-1
Cold Bend	(-20°C)	Pass	-	IEC 60811-1-4

* Data should not be used for specification work

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Electrical Properties

	Typical Value*	Unit	Test Method
Compound			
Volume Resistivity	10^{16}	Ω cm	IEC 60093
Dielectric Strength	> 20	kV/mm	IEC 60243
Cable (0.5 mm insulation over 1.5 mm^2 solid Cu)			
Insulation Resistance	40	MΩ cm	IEC 60227-2/2.4
Breakdown Duration	Pass	-	IEC 60227-2/2.3
Breakdown Voltage	27	kV	ISO 6722
Dielectric constant (50Hz)	2.2		IEC 60250

Combustion Properties

		Typical Value*	Unit	Test Method
Compound				
Cone Calorimeter (heat flux 35 kW/m^2, 3mm plaque)				ISO 5660
Ignition Time		75	s	
Rate of Heat Release	(Average)	400	kW/m^2	
Rate of Heat Release	(max.)	1330	kW/m^2	
Heat of Combustion		37.5 (41)	MJ/dm^3 (MJ/kg)	
Smoke Obscuration		476 (520)	m^2/dm^3 (m^2/kg)	
CO		0.024	kg/dm^3 (kg/kg)	
CO_2		2.4 (2.6)	kg/dm^3 (kg/kg)	
Cable VDE 0250 type NI + MH				
Vertical Burning[1)]		Pass	-	IEC 60332-1

* Data should not be used for specification work

Note: 1) Cable type NHMM/VDE 0250 Pt 215 consisting of 3 x 1.5 mm^2 solid copper conductors each insulated with 0.5 mm insulation **PP4821**, a halogen free EPDM based bedding and an outer jacket of **FR4803**.

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Processing Guidelines

PP4821 has been extruded to wire using a 60 mm extruder having a conventional 3:1 compression ratio screw. A solid copper conductor of 1.5mm^2 was coated with an insulation of 0.5mm thickness. The die diameter equalled the finished wire outer diameter (i.e. 2.5 mm). The following process conditions were applied:

Temperatures	Barrel 1	190°C
	Barrel 2	200°C
	Barrel 3	220°C
	Barrel 4	220°C
	Head/Die	220°C
Screw speed		100 rpm
Line speed		250 m/min

Under the above conditions the extrusion process was stable and the resulting wire had a smooth and glossy appearance.

Predrying of the compound is not required unless the material has been stored in a moist environment over a long period. In such cases drying in a dehumidifying drier for 2 hours at 100°C will normally reduce the moisture content to an acceptable value.

Delivery

Form:	Granules
Package:	25 kg Bags - 1375 kg loads
	1000 kg Octabins

Safety

PP4821 is not classified as a dangerous preparation.

The product is supplied in form of free-flowing granules of approximately 3-4 mm sizes and can be readily handled with commercially available equipment. Handling and transport of the product may generate some dust and fines, which constitute a potential hazard for dust explosion. All metal parts in the system should therefore be properly grounded. Properly designed equipment and good housekeeping will reduce the risk. Check and follow local codes and regulations!

Inhalation of any type of dust should be avoided as it may cause irritation of the respiratory system.

The product is intended for industrial use only. A Safety Data Sheet is available on request. Please contact your Borealis representative for more details on various aspects of safety, recovery and disposal of the product.

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