BPD3669

Product Technical Information

LLDPE with enhanced properties for:

- **Crosslinked low voltage cable insulation**
- **Base resin for high performance cable jacketing**

1. LLDPE with enhanced properties for crosslinked low voltage cable insulation

Applications

BPD3669 is a LLDPE copolymer containing hexene-1 as comonomer which, when compounded with suitable additives, is designed for silane crosslinked LV insulation. **BPD3669** can be used in a silane one step cross-linking process (Monosil® for example) and in a silane two step crosslinking process (Sioplas® process).

BPD3669 has been developed specifically to provide enhanced crosslinking and extrusion performances, thanks to proprietary process and catalyst and fit for purpose product design.

Physical properties of compound

Properties	Conditions	Test Methods	Values	Units
Physical				
Melt Flow Rate	190°C/2.16Kg	ISO 1133-1	3.3	g/10min
Density	23°C	ISO 1183-2	926	kg/m³

Physical properties of crosslinked compound as cable

BPD3669, when grafted in the laboratory with 0.8 % of a suitable silane/peroxide mixture and 0.05 % of a tin condensation catalyst, typically gives the following results on a 1.5 mm² cable after curing 2h in water at 80°C

Mechanical				
Tensile strength at Break	23°C, 50 mm/min	ISO 527-1	28	MPa
Tensile strain at Break	23°C, 50 mm/min	ISO 527-1	500	%
Hot set test	200°C, 15 min, 0.2 MPa	IEC 60811-507	60	%

Data should not be used for specification work

Compliance to Regulations

BPD3669 meets the following material specifications:

- ISO 1872/1-PE, KGN, 18-D045
- ASTM D 1248: Type I, Class A, Cat 3

May, 2014

Published by

INEOS Olefins & Polymers Europe

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Processing guidelines

BPD3669 is a LLDPE base resin. A suitable antioxidant package should be added to the product in order to meet heat ageing requirements. Since LLDPE compounds exhibit different extrusion performances compared to conventional materials, modifying some extrusion parameters may be necessary to achieve optimum throughput rates. Typical melt temperature to obtain a smooth processing will be in the region of 220-230°C.

BPD3669 can be run on existing Monosil® extruders. When correctly extruded, cables will present a smooth surface with minimal gel defects.

BPD3669 must be extruded with 0.7 – 0.9 % of vinyl trimethoxysilane, a suitable peroxide and a crosslinking catalyst. Commercial mixtures can be used for this purpose.

Satisfactory surface aspects of extrudates will be obtained with melt temperatures in the region of 225-235°C.

On a commercial line 150mm - 30 L/D a typical temperature profile would be:

Barrel: 150-160-170-180-190-200-210°C Head: 210-220-230°C Die: 270°C Screw cooling: 80°C

Additional information for Sioplas® process: the processing parameters depend on the additives introduced by the user (antioxidants), the grafting machine (first step) and the extruder (second step). Usually, 0.7 – 0.9 % of a vinyl trimethoxysilane and peroxide commercial solution is added to **BPD3669** during the grafting step.

Grafted **BPD3669** can be processed on existing extruders designed for polyethylene adding 0.03 - 0.07 of catalyst (DBTL). Commercial masterbatches can be used for this purpose.

Storage

The product should be stored in a dry and dust free environment at a temperature below 50°C. Exposure to direct sunlight should be avoided as this may lead to product degradation. A maximum storage time of 1 year is recommended.

May, 2014

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2. LLDPE with enhanced properties for high performance cable jacketing

Applications

BPD3669 is a LLDPE which, when compounded with suitable additives, is designed for jacketing of cables, especially power cables.

BPD3669 combines an enhanced environmental stress cracking resistance to excellent mechanical properties.

Physical properties of compound:

Properties	Conditions	Test Methods	Values	Units
Physical				
Melt Flow Rate	190°C/2.16Kg	ISO 1133-1	3.3	g/10min
Density	23°C	ISO 1183-2	926	kg/m³
Mechanical				
Tensile strength at Break		ISO 527-1	30	MPa
Tensile strain at Break		ISO 527-1	800	%
Low Temperature brittleness		ISO 974	-76	°C
Shore D Hardness	1 second	ISO 868	56	-
Environmental Stress Cracking Resistance (ESCR)	10 % "Igepal" F_o	IEC 60811-406	>1,000	h
Electrical				
Dielectric constant	1 MHz	ASTM D 1531	2.3	-
Dissipation factor	1 MHz	ASTM D 1531	70	µrad

Data should not be used for specification work

Compliance to Regulations

BPD3669 meets the following material specifications:

- ISO 1872/1-PE, KGN, 18-D045
- ASTM D 1248: Type I, Class A, Cat 3

May, 2014

Published by

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Processing guidelines

BPD3669 is a LLDPE base resin. A suitable antioxidant package should be added to the product in order to meet heat ageing requirements.

BPD3669 does not contain UV stabilization. For outdoor applications, a suitable anti-UV package should be added in order to fulfill the weatherability requirements. Since LLDPE compounds exhibit different extrusion behaviour compared to conventional materials and modifying some extrusion parameters may be necessary to achieve optimum throughput rates. Typical melt temperature to obtain a smooth processing will be in the region of 230°C

A typical extrusion temperature profile would be:

Barrel: 180-180-190-190-200-210 °C Head: 220-220-230 °C Die: 230°C

Storage

The product should be stored in a dry and dust free environment at a temperature below 50°C. Exposure to direct sunlight should be avoided as this may lead to product degradation. A maximum storage time of 1 year is recommended.

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The product and uses described herein may be subject to specific requirements or limitations for use in certain applications like food contact, drinking water or medical devices. Further information may be obtained from the website www.ineos.com where a specific Regulatory Certificate is available for each grade under the heading "SDS & Regulatory Certificate".

Unless specifically indicated, the product mentioned herein is not suitable for applications in the medical or pharmaceutical sectors.

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