PRODUCT DATA SHEET

Polyethylene

Bormed™ HE7541-PH

Description

Bormed HE7541-PH is a resin intended for evaluation for use in Healthcare applications.

Bormed HE7541-PH-03 is a bimodal high-density polyethylene typically used in articles produced via injection moulding. This grade combines high environmental stress crack resistance and easy processing. Material can be sterilised with ethylene oxide, steam and radiation up to 35 kGy; as a result of sterilisation by radiation some minor yellowing can occur.

Applications

Bormed HE7541-PH has been evaluated according to different regulations and norms. Typical applications are mentioned below for Medical devices or Pharmaceutical & Diagnostic packaging. However, Borealis should be consulted for final approval to evaluate the use of Bormed HE7541-PH .

Bottles and containers for tablets
Bottles and containers for powder
Bottles and containers for granules
Caps and closures
Shoulders for tubes

This grade may only be used for the applications listed in the Product Datasheet and only to the extent that the application is within the scope of the tests set out in the Statement on Compliance to Regulations on Medical Use for that grade. If an application is not listed in the Product Datasheet, the grade can be used for such application only after express written consent of the Borealis Marketing Manager, Healthcare.
Borealis prohibits the use of any healthcare grade product in an implantable device that is introduced into the human body by surgical intervention and that is intended to remain in place following surgical procedure.

Special Features

Easy processing
High ESCR

Physical Properties

Property	Typical Value Data should not be used for specification work	Test Method
Density	954 kg/m³	ISO 1183
Melt Flow Rate (190 °C/2,16 kg)	4 g/10min	ISO 1133
Flexural Modulus	1.250 MPa	ISO 178
Tensile Modulus (1 mm/min) [1]	1.150 MPa	ISO 527-2
Tensile Strain at Yield (50 mm/min) [1]	9 %	ISO 527-2
Tensile Stress at Yield (50 mm/min) [1]	26 MPa	ISO 527-2
Heat Deflection Temperature (0,45 MPa) [2]	71 °C	ISO 75-2
Environmental Stress Crack Resistance (, Igepal 10 %, F50)	40 h	ASTM D 1693-A
Hardness, Shore D	61	ISO 868

[1] Measured on injection moulded specimens acc. to ISO 1872-2

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[2] Measured on injection moulded specimens acc. to ISO 1873-2

Processing Techniques
Following parameters should be used as guidelines:

Injection Moulding

Melt temperature	190 - 250 °C	
Holding pressure	As low as possible	Minimum to avoid sink marks.
Mould temperature	10 - 40 °C	
Injection speed	As high as possible.	

Shrinkage 1 - 2 %, depending on wall thickness and moulding parameters

Storage
Bormed HE7541-PH should be stored in dry conditions at temperatures below 50°C and protected from UV-light. Improper storage can initiate degradation, which results in odour generation and colour changes and can have negative effects on the physical properties of this product.

Safety
The product is not classified as dangerous.

Recycling
The product is suitable for recycling using modern methods of shredding and cleaning. In-house production waste should be kept clean to facilitate direct recycling.

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.

Related Documents
The following related documents are available on request, and represent various aspects on the usability, safety, recovery and disposal of the product.

"Safety data sheet" / "Product safety information sheet"
Statement on chemicals, regulations and standards
Statement on compliance to food contact regulations
Statement on compliance to regulations on medical use
Statement on polymer additives and BSE

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Disclaimer

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.

Lupolen 1800 H

Polyethylene, Low Density

Product Description

Lupolen 1800 H is a low density polyethylene (LDPE) resin used in a wide range of processing methods such as injection molding, blow molding and film extrusion. It exhibits very good softness and toughness and good dimensional stability. *Lupolen* 1800 H is delivered in pellet form and is not additivated. Typical customer applications include caps & closures, lids and champagne corks. *Lupolen* 1800 H is not intended for use in medical and pharmaceutical applications.

Product Characteristics

Status	Commercial: Active
Test Method used	ISO
Availability	Europe, Asia-Pacific, Australia/NZ, Africa-Middle East, Latin America
Processing Methods	Blown Film, Extrusion Blow Molding, Injection Molding
Features	Low Density, Good Flexibility, Low Temperature Impact Resistance, Good Processability
Typical Customer Applications	Blow Moulding Applications, Bottles For Consumer Goods, Caps & Closures, Sports, Leisure and Toys

Typical Properties	Method	Value	Unit
Physical			
Density	ISO 1183	0.919	g/cm³
Melt flow rate (MFR) (190°C/2.16kg)	ISO 1133	1.5	g/10 min
Mechanical			
ESCR	ASTM D 1693	5	h
Note: Tested in 10% nonionic surfactants			
Tensile Modulus	ISO 527-1, -2	200	MPa
Tensile Stress at Yield	ISO 527-1, -2	9	MPa
Hardness			
Shore hardness (Shore D)	ISO 868	45	
Ball indentation hardness (H 49/30)	ISO 2039-1	15	MPa
Thermal			
Vicat softening temperature (A50 (50°C/h 10N))	ISO 306	88	°C
Melting Temperature	ISO 3146	108	°C

Additional Properties

Spiral length (2mm/1000bar/180ºC) Basell method: 36cm
Recommended processing temperature 180°C - 230°C

Notes

Typical properties; not to be construed as specifications.

Further Information

***Lupolen* 1800 H**

Conveying: Conveying equipment should be designed to prevent production and accumulation of fines and dust particles that are contained in polymer resins. These particles can under certain conditions pose an explosion hazard. We recommend the conveying system used is equipped with adequate filters, is operated and maintained that no leak develops and adequate grounding exists at all times.

Health and Safety:
The resin is manufactured to the highest standards but, special requirements apply to certain applications such as food end-use contact and direct medical use. For specific information on regulatory compliance contact your local representative.

Workers should be protected from the possibility of skin or eye contact with molten polymer. Safety glasses are suggested as a minimal precaution to prevent mechanical or thermal injury to the eyes.

Molten polymer may be degraded if it is exposed to air during any of the processing and off-line operations. The products of degradation have an unpleasant odour. In higher concentrations they may cause irritation of the mucus membranes. Fabrication areas should be ventilated to carry away fumes or vapours. Legislation on the control of emissions and pollution prevention must be observed. If the principles of sound manufacturing practice are adhered to and the place of work is well ventilated, no health hazards are involved in processing the resin.

The resin will burn when supplied with excess heat and oxygen. It should be handled and stored away from contact with direct flames and/or ignition sources. In burning the resin contributes high heat and may generate a dense black smoke. Starting fires can be extinguished by water, developped fires should be extinguished by heavy foams forming an aqueous or polymeric film. For further information about safety in handling and processing please refer to the Material Safety Data Sheet.

Storage:
The resin is packed in 25 kg bags or in bulk containers protecting it from contamination. If it is stored under adverse conditions, i. e. if there are large fluctuations in ambient temperature and the atmospheric humidity is high, moisture may condense inside the packaging. Under these circumstances, it is recommended to dry the resin before use. Unfavourable storage conditions may also intensify the resin´s slight characteristic odour.

The resin is subjected to degradation by ultra-violet radiations or by high storage temperatures. Therefore the resin must be protected from direct sunlight, temperatures above 40°C and high atmospheric humidity during storage. The resin can be stored over a period of more than 6 month without significant changes in the specified properties, appropriate storage conditions provided. Higher storage temperatures reduce the storage time.

The information submitted is based on our current knowledge and experience. In view of the many factors that may affect processing and application, these data do not relieve processors of the responsibility of carrying out their own tests and experiments; neither do they imply any legally binding assurance of certain properties or of suitability for a specific purpose. The data do not relieve the customer from his obligation to control the resin upon arrival and to complain about faults. It is the responsibility of those to whom we supply our products to ensure that any proprietary rights and existing laws and legislation are observed.

This product(s) may not be used in:

(i) any U.S. FDA Class I, Health Canada Class I, and/or European Union Class I Medical Devices, without prior notification to Seller for each specific product and application; or

(ii) the manufacture of any of the following, without prior written approval by Seller for each specific product and application: (1) U.S. FDA Class II, Health Canada Class II or Class III, and/or European Union Class II Medical Devices; (2) film, overwrap and/or product packaging that is considered a part or component of one of the aforementioned Medical Devices; (3) packaging in direct contact with a pharmaceutical active ingredient and/or dosage form that is intended for inhalation, injection, intravenous, nasal, ophthalmic (eye), digestive, or topical (skin) administration; (4) tobacco related products and applications; (5) electronic cigarettes and similar devices; and (6) pressure pipe or fittings that are considered a part or component of a nuclear reactor.

(iii) Additionally, the product(s) may not be used in: (1) U.S. FDA Class III, Health Canada Class IV, and/or European Class III Medical Devices; (2) applications involving permanent implantation into the body; (3) life-sustaining medical applications; and (4) lead, asbestos or MTBE related applications.

All references to U.S. FDA, Health Canada, and European Union regulations include another country's equivalent regulatory classification.

Users should review the applicable Material Safety Data Sheet before handling the product.

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