

# Polyethylene Borstar® FB2230

## Description

**Borstar FB2230** is a high molecular weight linear low density polyethylene film grade combining good and flexible extrusion behaviour, excellent draw down and superior mechanical properties

For films made of Borstar FB2230 , the high toughness remains in cold conditions.

## Applications

**Borstar FB2230** has been developed especially for applications like: <sup>®</sup>

Agricultural films  
Food packaging  
Frozen food packaging

Heavy-duty sack  
Lamination films  
General packaging film

## Additives

**Borstar FB2230** contains antioxidant.

## Physical Properties

Property	Typical Value	Test Method
Data should not be used for specification work		
Density	923 kg/m <sup>3</sup>	ISO 1183
Melt Flow Rate (190 °C/2,16 kg)	0,2 g/10min	ISO 1133
Melt Flow Rate (190 °C/5,0 kg)	0,9 g/10min	ISO 1133
Melt Flow Rate (190 °C/21,6 kg)	22 g/10min	ISO 1133
Melting temperature	124 °C	ISO 11357-3
Vicat softening temperature (10 N)	101 °C	ISO 306

## Film Properties

Film properties are measured on 40 µm blown film produced on a 60 mm W&H extruder with L/D 30 and die 200 x 1,2 mm, BUR = 3:1, FLH = 2DD.

Property	Typical Value	Test Method
Data should not be used for specification work		
Dart Drop	300 g	ISO 7765-1
Puncture resistance	Energy to break 5 J	ASTM D 5748
	Force 65 N	
Haze	70 %	ASTM D 1003
Gloss	10	ASTM D 2457
Tensile Strain at Break <sup>1</sup>	MD 450 %	ISO 527-3
Tensile Strain at Break	TD 750 %	ISO 527-3
Tensile Strength	MD 55 MPa	ISO 527-3
Tensile Strength	TD 45 MPa	ISO 527-3
Tensile Modulus	MD 250 MPa	ASTM D 882-A
Tensile Modulus	TD 300 MPa	ASTM D 882-A

Borstar is a registered trademark of Borealis A/S, Denmark.

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Tear resistance (Elmendorf)	MD 3 N TD 11 N	ISO 6383/2
Water Vapour Transmission Rate (38 °C, 90 % RH)	8 g/m <sup>2</sup> *d	ISO 15106-2

<sup>1</sup> MD = machine direction, TD = transverse direction.

### Processing Techniques

Borstar FB2230 is easily processed on conventional extruders.

**Borstar FB2230** can be processed in most types of blown film equipment, incl. LDPE, LLDPE or even HDPE extruders.

The balance of draw down properties and bubble stability is superior to conventional LLDPE and LDPE. Thicknesses of 10 to >200µm can be processed with good bubble stability. **Borstar FB2230** is well suited for co-extrusion.

Recommended extrusion temperature is 190-210°C. Conventional die gaps can be used without shark skin or draw down problems. A gap of 1.0 - 1.5 mm will give the best balance between extruder pressure and physical properties in the film. Wider die gap gives higher machine direction orientation and narrow die gap may give too high extruder pressure.

**Borstar FB2230** is sensitive to the orientation obtained by the film blowing conditions like Blow Up Ratio (BUR) and Frost Line Height (FLH). Higher impact can be achieved by rising the FLH to 4DD. High BUR (>2) also results in better mechanical properties and better balance in MD/TD.

As a guideline the following conditions should be used.

FLH: 2 - 4 DD  
BUR: 3:1

### Storage

**Borstar FB2230** 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 a dangerous preparation.

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.

### 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.



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## Related Documents

Most Data sheet and safety data sheets are available on Borealis web site [www.borealisgroup.com](http://www.borealisgroup.com). If the data sheets not could be found on the web, Borealis contact person could supply with information.

## 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.

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