

July 2008

# Borstar<sup>®</sup> FB2230

## ENHANCED POLYETHYLENE FOR HIGH PERFORMANCE FLEXIBLE PACKAGING

### DESCRIPTION

**Borstar FB2230** is an enhanced polyethylene film grade combining good and flexible extrusion behaviour, excellent draw down and superior mechanical properties. Film made from **Borstar FB2230** exhibits high dart impact strength combined with excellent yield, tensile strength and increased stiffness. Toughness is retained at low temperature. The film has high seal strength, good hot tack force and superior ESCR properties. **Borstar FB2230** contains antioxidant and low content of anti-blocking agent.

### APPLICATIONS

**Borstar FB2230** is well suited for mono and coextrusion in a wide range of applications due to its unique balance of properties. The superior mechanical properties will improve the functionality of the films or allow for substantial material savings (down gauging) compared to conventional PE. Typical applications: Agriculture Film (incl. Greenhouse Film), Lamination (incl. Stand Up Pouches), Security Packaging, Shrink Film, Exclusive Carrier/Boutique bags, Industrial Film, Frozen Food and Compression Packaging.

### FOOD CONTACT REGULATIONS

**Borstar FB2230** fulfils the food contact regulations in most countries. If required, contact your Borouge representative for a certificate.

PHYSICAL PROPERTIES	Typical Value*	Unit	Test Method
Density	923	kg/m <sup>3</sup>	ASTM D 1505
Melt Flow Rate MFR (190°C/2.16 kg)	0.25	g/10 min	ASTM D 1238
Melt Flow Rate MFR (190°C/5.0 kg)	1.0	g/10 min	ASTM D 1238
Melt Flow Rate MFR (190°C/21.6 kg)	22	g/10 min	ASTM D 1238
Melting temperature	124	°C	ISO 11357/03
Vicat Softening Temperature A (10 N)	101	°C	ISO 306
ESCR - 10% Igepal / F50	>5000	Hours	ASTM D 1693

\* Data should not be used for specification work

### PROCESSING GUIDELINES

**Borstar FB2230** can be processed in most types of blown film equipment such as LDPE, LLDPE or HDPE extruders. The balance of draw down properties and bubble stability is superior to conventional LLDPE and LDPE. Thickness 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. A die 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.

**Borstar FB2230** is influenced on the orientation obtained by the running conditions like Blow Up Ratio (BUR) and Frost Line Height (FLH). Higher impact strength can be achieved by raising the FLH. High BUR (>2) also results in improved mechanical properties.

Recommended processing conditions:

Melt temperature 190 –210°C  
 FLH: 2 - 4 DD  
 BUR: >2:1

FILM PROPERTIES**		Typical Value*	Unit	Test Method
Tensile Strength at Break	MD/TD	50/40	MPa	ASTM D 882
Elongation at Break	MD/TD	550/750	%	ASTM D 882
Tensile Strength at Yield	TD	12	MPa	ASTM D 882
Secant Modulus (0.05-1.05%)	MD/TD	200/250	MPa	ASTM D 882
Coefficient of Friction		0.4	-	ASTM D 1894
Haze		65	%	ASTM D 1003
Gloss		15		ASTM D 2457
Dart Drop		600	g	ASTM D 1709/A
Elmendorf Tear Strength	MD/TD	300/700	g	ASTM D 1922
Puncture Resistance, force		50	N	ASTM D 5748
Puncture Resistance, energy		3	J	ASTM D 5748

\* Data should not be used for specification work

\*\* The film properties are dependent on extrusion conditions.

Film properties: 40µm , BUR=3.1, FLH = 4DD, Die gap 1.2 mm.

## STORAGE AND HANDLING

**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 the product.

## SAFETY

**Borstar FB2230** is not classified as a dangerous preparation.

Dust and fines from the product carry a risk of dust explosion. All equipment should be properly earthed. Inhalation of dust should be avoided as it may cause irritation of the respiratory system. Small amounts of fumes are generated during processing of the product. Proper ventilation is therefore required.

A Safety Datasheet is available on request. Please contact your Borouge representative for more details on various aspects of safety, recovery and disposal of the product.

## 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.

## RELATED DOCUMENTS

Most datasheets and statements are available on Borouge website [www.borouge.com](http://www.borouge.com). If the datasheets or statements cannot be found on the web, please contact a Borouge representative for information.

Borstar<sup>®</sup> is a registered trademark of Borealis A/S, Denmark.

### 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.

**Borouge 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.**

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