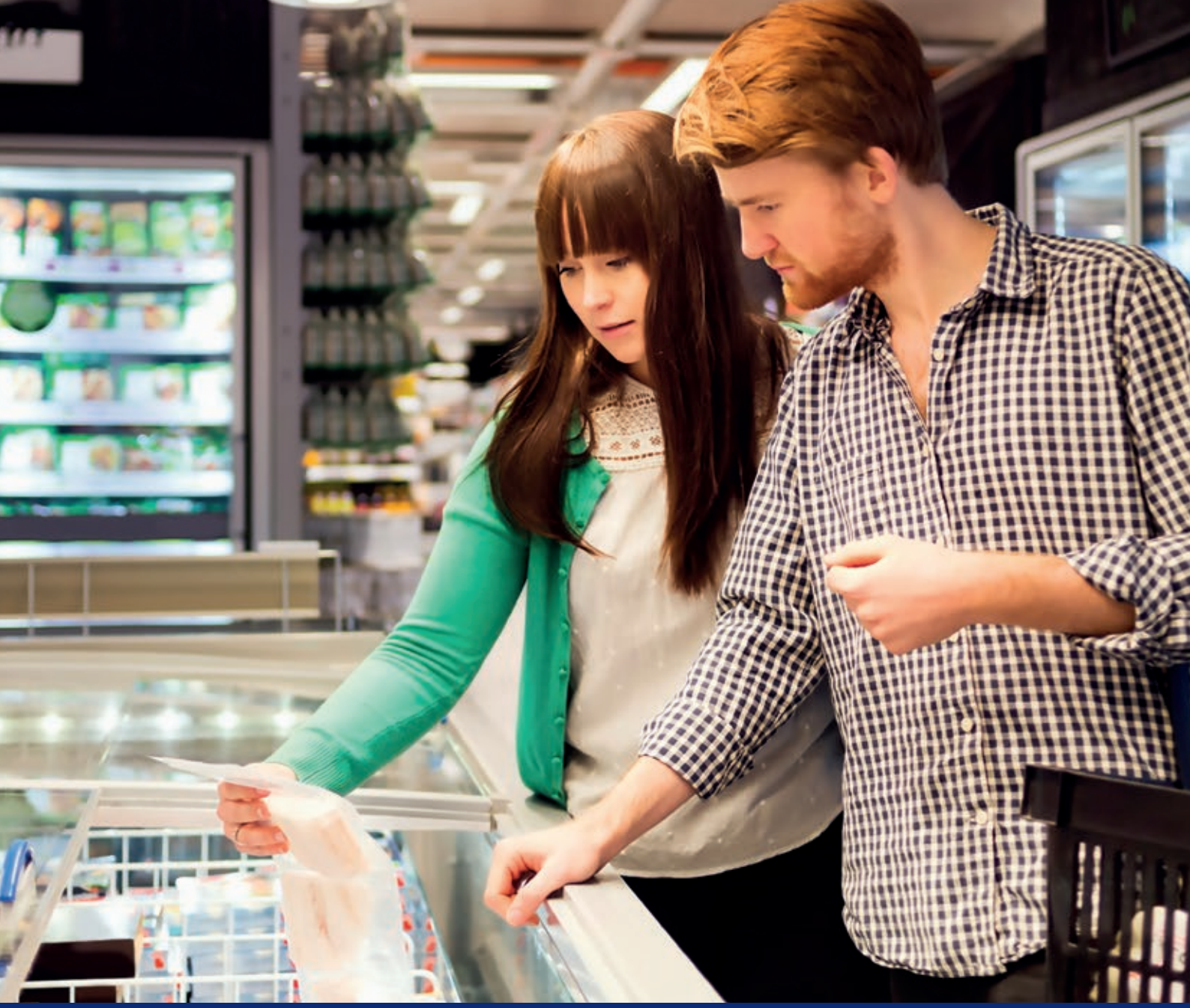

SUMMARY DATA SHEET

PO Blown Film Applications

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Summary Data Sheet for
PE Blown Film Applications

Abbreviations
B = Backbone, core layer
C = Cling layer
L = Lamination layer
S = Sealing
O = Optical properties
I = Impact
BL = Blocking layer
ST = Stiffness

Property	Test Method
Density	ISO 1183
Melt Flow Rate (190°C/2,16kg)	ISO 1133
Melt Flow Rate (190°C/5kg)	ISO 1133
Melt Flow Rate (190°C/21,6kg)	ISO 1133
Melting temperature (DSC)	ISO 11357-3
Dart Drop	*ASTM D 1709/A (for Anteo product family)
	ISO 7765-1

Property	Test Method
Puncture Force	ASTM D 5748
Puncture Energy (J/mm)	ISO 7765-2
Puncture Energy (J)	*ASTM D 5748 (for Anteo product family)
Tensile Strain, Strength, Modulus	ISO 527-3
Tear Resistance (g)	*ASTM D 1922 (for Anteo product family)
Tear Resistance (N/mm)	ISO 6383/2

Properties measured on 40µm film samples except for FA3227 (125µm), FT3200 (125µm) and FB1350 (25µm)

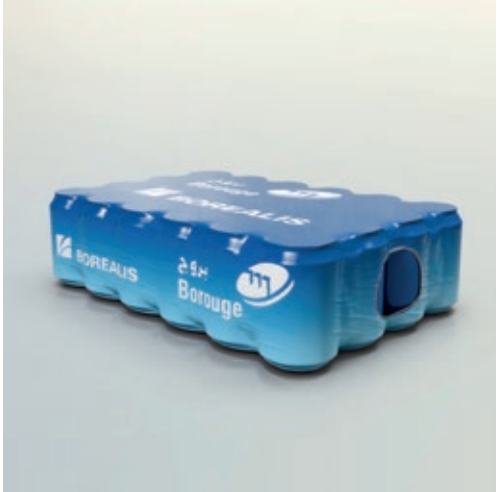
Product name	MFR 190°C/2,16kg (g/10min)	MFR 190°C/5kg (g/10min)	MFR 190°C/21,6kg (g/10min)	Density (kg/m³)	Melting temp. (°C)	AO	Antiblocking agent (ppm)	Slip agent (ppm)	Other additives	Tensile strength at break MD (MPa)	Tensile strength at break TD (MPa)	Tensile modulus MD (MPa)	Tensile modulus TD (MPa)	Elongation at break MD (%)	Elongation at break TD (%)	Dart drop impact (g)	Puncture force (N)	Puncture energy	Elmendorf tear strength MD	Elmendorf tear strength TD	Features	Flexible food packaging	Collation shrink	Heavy duty sack	Stretch hood	General packaging	Liquid packaging	Protective film	Agricultural film	Geomembrane	MDO	Other films & liners
Anteo™																																
FK1820	1.5			918	122	yes			PPA	52	50	210	220	650	700	>1000*	55	4.5*	550*	700*	Sealing, optics (in blend with LD), easy to extrude, high impact, puncture and tear resistance	S, O, L	O	S, I	S, I	S, O	S, I	O	I	I	S, O	S, O
FK1828	1.5			918	122	yes	yes	yes	PPA	52	50	210	220	650	700	>1000*			550*	700*	Sealing, optics (in blend with LD), easy to extrude, high impact, puncture and tear resistance	S, O, L	O	S	S, I	S, O	S	O			S, O	S, O
FK2715	1.3			927	125	yes			PPA	60	50	300	350	600	700	>200*			160*	460*	Sealing, optics (in blend with LD), easy to extrude, stiffness/impact balance	ST, L	ST, O	ST		ST, L						ST, B, L
Borshape™																																
FX1001	0.2	0.85	20	933	127	yes				60	50	500	640	560	700	410		28	50	290	Bubble stability, excellent stiffness/toughness balance (kept at cold conditions), high holding force, MDO film production, excellent ESCR and flex crack resistance, high recyclate incorporation enabler	B, L	B	B		B	B				B	B
FX1002	0.4	2.0	42	937	128	yes				60	50	560	760	580	750	260		28	50	290	Bubble stability, easy to extrude, excellent stiffness/toughness balance, high holding force, MDO film production	B, L	B			B					B	B
FX1003	0.35	1.5	35	941	128	yes				56	49	630	850	580	740	265			27	250	Bubble stability, easy to extrude, excellent stiffness/toughness balance, high holding force, MDO film production, high recyclate incorporation enabler	B,L	B	B		B					B	B
Borstar® LLDPE																																
FB2230	0.2	1.0	22	923	124	yes				55	45	250	390	540	750	250		20	43	250	Bubble stability, good stiffness/toughness balance (kept at cold conditions), excellent ESCR and flex crack resistance, high recyclate incorporation enabler	B	B	B		B	B	B	B	B	B, S	B
FB4230	0.4	2.0	44	923	124	yes				50	40	300	422	600	750	175		15	46	200	Bubble stability, easy to extrude, good mechanical properties	B, L				B		B				B
FB2310	0.2	0.9	20	931	127	yes				60	53	418	550	538	700	230		20	50	250	Bubble stability, good stiffness/toughness balance (kept at cold conditions), high holding force	B	B	B		B					B	B
FB4370	0.4	2.1	42	937	128	yes				55	40	589	781	617	830	100		10	35	200	Bubble stability, easy to extrude, stiffness modifier	ST, L	B			ST						B
FB3450	0.3	1.1	25	945	129	yes				60	50	550	750	500	800	80		8	20	150	Bubble stability, easy to extrude, stiffness modifier	ST	ST			ST					ST	ST
Borstar® MDPE																																
FB1350		0.6	15	935	127	yes				57	48	500	650	400	650	150		15	12	290	Bubble stability, stiffness, mono and coextrusion with high or low neck extrusion			B		B, ST				B		B, ST
Queo™																																
6800LA	0.5			868	47	low amount															Versatile blending partner with other polyolefins, high clarity, high flexibility,surface softness, low peak melting point	X				X		X				X
7001LA	1.0			870	56	low amount															Versatile blending partner with other polyolefins, high clarity, high flexibility, surface softness, low peak melting point	X				X		X				X
8201	1.1			883	73	yes															Versatile blending partner with other polyolefins, high clarity, toughness, puncture resistance, low temperature impact strength, sealing through contamination	X				X		X			BL	X
8201LA	1.1			883	75	low amount															Versatile blending partner with other polyolefins, high clarity, toughness, puncture resistance, low temperature impact strength, sealing through contamination	X				X		X			BL	X
8203	3			883	74	yes															High melt strength – processability balance, toughness, puncture resistance, low temperature impact strength	X				X					BL	X
0201	1.1			902	97	yes															Environmental stress cracking resistance, high clarity, blending partner, sealing through contamination, hot tack at low temperature, toughness, puncture resistance	X		X		X				X	BL	X
0201FX	1.1			902	95	yes	yes	yes	PPA												COF consistency, clarity, blending partner, sealing through contamination, hot tack at low temperature, toughness, puncture resistance, low temperature impact strength	X				X				X		X
LDPE Autoclave																																
FA3227	0.3			922	110	no			UV	25	23	190	190	400	600	450			5	6	Bubble stability, easy to extrude, excellent shrink properties, industrial films, building films for moisture barrier		X	X		X				X		X
FA5223	1.2			922	110	yes	850			26	23	180	180	300	500	140			4	2	Bubble stability, easy to extrude, collation shrink film, bags, pouches on reel	X	X			X						X
FA5224	1.2			922	110	yes	850	450		26	23	180	180	300	500	140			4	2	Bubble stability, easy to extrude, collation shrink film, bags, pouches on reel	X	X			X						X
FA6220	2.1			922	111	yes				26	20	200	210	350	600	100			5	3	Bubble stability, easy to extrude, bags, pouches with good optical properties	X				X						X
FA6224	2.1			922	111	yes	850	500		26	20	200	210	350	600	100			5	3	Bubble stability, easy to extrude, bags, pouches with good optical properties	X				X						X
FA7220	4			922	111	yes				24	18	200	180	400	650	80			3	2	Bubble stability, easy to extrude, bag, thin protective shrink film, cast cling film, excellent optical properties	X				X						X
FA7224	4			922	111	yes	1110	700		20	18	200	180	400	650	80			3	2	Bubble stability, easy to extrude, bag, pouches with good optical properties, cast film	X				X						X
LDPE Tubular																																
FT3200	0.25			920	110	no				25	26	160	160	400	600	500			4	7	Bubble stability, easy to extrude, excellent shrink properties, industrial films, optical properties	X	X	X		X			X	X		X
FT5230	0.75			923	112	no				27	24	230	260	250	550	120			4	2	Bubble stability, easy to extrude, collation shrink film, bags, pouches, blending partner for Anteo for good optical properties	X	X			X						X
FT5236	0.75			923	112	yes	800	550		27	24	230	260	250	550	120			4	2	Bubble stability, easy to extrude, collation shrink film, bags, pouches	X	X			X						X
FT6230	2.0			923	111	no				25	20	180	190	300	600	100			3	2	Bubble stability, easy to extrude, bags, pouches with good optical properties	X				X						X
FT6236	2.0			923	111	yes	800	550		25	20	180	190	300	600	100			3	2	Bubble stability, easy to extrude, bags, pouches with good optical properties	X				X						X
FT7230	4.0			923	109	no				20	18	180	190	300	600	70			3	2	Easy to extrude, for production of packaging film with excellent optical properties and low thickness	X				X						X

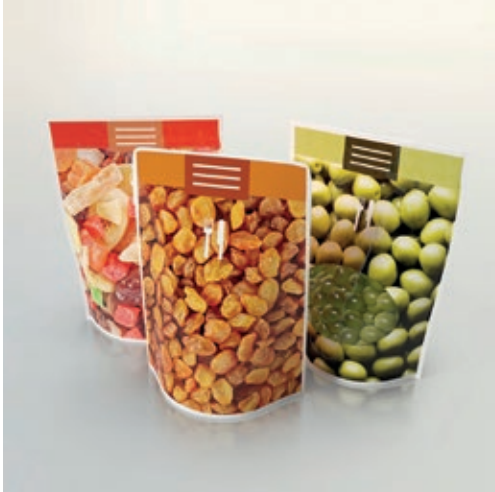
Summary Data Sheet for
PP Blown Film Applications

Product name	MFR 230°C/2.16kg (g/10min)	MWD	Melting Temp. (°C)	Nucleated	Vicat A50 (°C)	Tensile Modulus MD/TD [Mpa] (50µm)	Features	Applications
PP Homopolymers								
HC205TF	4.0	medium	164	yes	152	1650/1500	High stiffness, good transparency and glossy	Printable substrate for mono-material laminate
PP Heterophasic Copolymers								
BA110CF	0.85	medium	164	no	150	1200/1100	Balanced stiffness/toughness ratio, sterilisable	Lamination film for food packaging, monoaxial oriented film, hygienic film, siliconisable film
BB213CF	1.2	narrow	164	no	150	1100/1000	Balanced stiffness/toughness, sterilisable	Stand-up pouch for retorted food
BC918CF	3.0	medium	168	yes	155	1550/1150	High stiffness/toughness balance, good optics after sterilisation	Lamination film, stand-up pouch, label film
PP Random Copolymers								
RB707CF	1.5	medium	145	yes	122	950/900	High stiffness, good optics	Lamination film, label film, food packaging
PP Random/Heterophasic Copolymers								
SA233CF	0.8	medium	141	no	114	500/500	Low tempertature resistance, high softness and toughness	Lamination film, hygienic film, industrial packaging, stand-up pouch

Typical values not to be construed as specifications
MWD = Molecular Weight Distribution

Property	**Test Method**
Melt Flow Rate (230°C/2,16kg)	ISO 1133
Melting temperature (DSC)	ISO 3146
Vicat A50	ISO 306
Tensile Modulus	ISO 527-3





Key trends and answers
in the flexible packaging film industry

An overview of key trends driving the flexible packaging film industry might begin with the issue of food safety and freshness. The amount of available arable land is finite, yet global demand for food is growing. The agriculture industry must seek out the most efficient methods of getting more food to the table – faster and fresher than ever before. Polyolefins will maintain their principal role as the backbone of most packaging solutions because they can best safeguard the quality and shelf life of food, and can fulfil increasingly stringent regulatory and legislative requirements. What is more, polyolefins can help make enhanced functionalities possible, such as peelability, breathability, and sterilisability; they also boast high barrier and light blocking properties, and are microwavable.

As convenience continues to drive the industry, consumers want packaging that not only retains freshness, but is easy to open and reseal. Demand for long-life food products is also bolstering the trend towards retortable plastic packaging. Brand owners aim to differentiate their product from those of their competitors by way of aesthetically appealing packaging.

Another key driver is sustainability. In the true spirit of **EverMinds™**, Borealis is a frontrunner in helping to build a circular economy for plastics.

As brand owners respond to legislative and regulatory pressure by downgauging, design for recycling, increasing recycled content and reducing reliance on fossil-fuel based feedstocks, polyolefins play an essential role as enabler by making products lighter, recyclable, more climate friendly and eco- & cost efficient.

Borealis, together with its wholly-owned recycling subsidiaries, mtm plastics and Ecoplast, is an integral player in the industry working together along the value chain to accelerate the transformation from a linear to a circular economy.

Many packaging structures have traditionally used multi-material laminates which can be very difficult to recycle in mechanical recycling processes, while polyolefins (PE and PP) are an ideal material for designing flexible and rigid packaging that can be recycled.

Design for recycling shall deliver high-quality mono-material recycle streams which can then be incorporated into various next-step PE and PP structures.

The **Bornewables™** is a portfolio of circular polyolefin products, manufactured with second generation renewable feedstock, providing a carbon footprint reduction while offering equally high material performance.

Borcycle™ C is a portfolio of virgin-like polyolefins from chemically recycled post-consumer waste.

To learn more about how Borealis can help you create more sustainable solutions, please contact your Borealis representative.

Making everyday life easier | Date of issue: July 2022

About Borealis Borealis is one of the world's leading providers of advanced and circular polyolefin solutions and a European market leader in base chemicals, fertilizers and the mechanical recycling of plastics. We leverage our polymers expertise and decades of experience to offer value adding, innovative and circular material solutions for key industries. In re-inventing for more sustainable living, we build on our commitment to safety, our people and excellence as we accelerate the transformation to a circular economy and expand our geographical footprint.

With head offices in Vienna, Austria, Borealis employs 6,900 employees and operates in over 120 countries. In 2021, Borealis generated total sales and other income of EUR 10,153 million and a net profit of EUR 1,396 million. OMV, the Austria-based international oil and gas company, owns 75% of Borealis, while the remaining 25% is owned by a holding company of the Abu-Dhabi based Mubadala. We supply services and products to customers around the globe through Borealis and two important joint ventures: Borouge (with the Abu Dhabi National Oil Company, or ADNOC, based in UAE); and Baystar™ (with TotalEnergies, based in the US).

www.borealisgroup.com | www.borealiseverminds.com

FOR MORE INFORMATION:
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