

## **Borstar®-based Full PE Laminate solution improves recyclability of flexible packaging materials**

Borealis and Borouge, leading providers of innovative, value-creating plastics solutions, announce the introduction of a step-change concept in flexible plastic packaging, the Full PE Laminate solution. Based on the proprietary Borstar® bimodal polyethylene (PE) technology in combination with machine direction oriented (MDO) processing technology, this novel monomaterial solution offers a second life to PE-based packaging as valuable end products, without compromising on product efficiency or integrity. Developed and tested in cooperation with a consortium of leading partners along the value chain, the Full PE Laminate solution is now being showcased at the K Fair 2016 in Düsseldorf.

### **Flexible packaging and recyclability: the status quo**

Flexible plastic packaging, typically in the form of stand-up pouches, films, bags, liners, or wraps, is one of the fastest growing segments of the packaging industry. Flexible packaging helps safeguard the quality and safety of consumer and industrial products, but also fulfils consumer demand for value-added functionality and convenience. Compared to rigid packaging alternatives such as glass and metal, flexible plastic packaging demonstrates better performance when it comes to sustainability parameters such as lower overall carbon footprint.

Yet up until now, a significant drawback in flexible plastic packaging involved its complex structure. While rigid materials are primarily monomaterial-based (e.g. entirely of glass, aluminium etc.), flexible materials have traditionally been multimaterial. This makes recycling less efficient and therefore less attractive. What is more, multimaterial recyclate is of only limited use, for example in lower-quality moulded applications.

### **A second life for polyethylene-based flexible packaging materials thanks to Borstar**

Borealis and Borouge, in cooperation with leading partners along the value chain, now present a sustainable solution to the complex issue of inferior recyclate: a monomaterial PE for flexible packaging based on the proprietary Borstar bimodal technology in combination with MDO processing technology.

Packaging solutions of Full PE Laminate are as efficient in terms of performance as other flex pack structures and serve as 100% substitutes for multimaterial film solutions in pouches and packs. Most compellingly, the recyclate gained from Full PE Laminate packs can be used for valuable end products with no loss in efficiency, and can even be used to produce PE film products.



Image: Full Polyethylene (PE) laminate pouch

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The production-related advantages are also persuasive:

- Very high stiffness, at levels found only in conventional substrates
- Excellent toughness and abuse resistance
- More efficient operations in the MDO process itself, and film of especially high quality
- Resulting film is easy to print, laminate and convert for demanding packaging applications such as stand-up bags and pouches.

“Borealis and Borouge believe that plastics are too valuable to be thrown away and should be recycled for a second, third or even fourth life,” explains Anton Wolfsberger, Borealis Head of Marketing Consumer Products and Pipe. “Making flexible packaging more recyclable goes a long way to improving overall environmental performance. By leveraging our proprietary Borstar technology and working closely with our valued partners, we have been able to further enhance the life cycle attributes of flexible packaging.”

### **The path to a second life: partnering with experts along the value chain**

Developing the Full PE Laminate solution has been a joint effort among Borealis, Borouge and a consortium of leading firms across the value chain, each representing the most advanced expertise within their respective areas.

**Borealis and Borouge:** the combination of the proprietary Borstar bimodal PE technology and Borealis resins forms the foundation of PE films with excellent performance characteristics, efficiency, and pleasing aesthetics.

**Hosokawa Alpine:** a leading technology supplier specialised in developing, engineering and installing machines and systems for process technology and film extrusion for customers around the world, Hosokawa Alpine uses Borealis resins in the MDO process to produce PE films so innovative and efficient that they can function as replacements for conventional substrates in complex pack structures.

**BOBST:** as one of the leading international suppliers of equipment and services to packaging and label manufacturers in the folding carton, corrugated board and flexible materials industries, BOBST demonstrated the high processing speed and quality of the MDO film on its rotogravure printing lines and laminators, showing clearly that there is no loss of efficiency when compared to other substrates. This is a significant novelty in the market as it demonstrates that a PE-based film can be efficiently printed in rotogravure lines, further expanding the possibilities of using PE and rotogravure in the flexible packaging market.

**GEA:** as experts in developing innovative solutions for smart food processing, GEA has produced a stand-up pouch at high packaging speeds on its vertical form fill and seal (VFFS) pack line. There will be a live pack line demonstration at the K Fair 2016.

**Erema:** the global market leader in plastic recycling systems, the name Erema stands for efficiency in plastic recycling. Their production of high-quality regranulate from Full PE Laminate film solution and shopping bags made of 100%-recycled material will be on show at the K Fair 2016.

“As a customer-centric and solution-oriented company, establishing and deepening partnerships is key to future success. Our collaboration with Borealis and Borouge has been most constructive,” states Gerold Breuer, Head of Marketing & Business Development, Erema. “With regulatory guidelines in many parts of the world stipulating higher mechanical recycling targets, the success of this project puts us ahead of the curve. We look forward to presenting it to a wider audience at the K Fair.”

## **Denkstatt study proves sustainability of Full PE Laminate solution**

Sustainability consulting firm Denkstatt was commissioned by Borealis to carry out a life cycle assessment (LCA) of this step-change solution. This recent study reveals that the Full PE Laminate solution further improves the already advantageous environmental sustainability of the flex pack. Assuming an overall recycling rate of 50%, flexible packaging based on the Full PE Laminate can further reduce the carbon footprint by (more than) 15% compared to a film solution which is not recyclable, or only recyclable into low quality recycling products.

**K Fair 2016 takes place from 19 to 26 October in Düsseldorf, Germany.  
“Join Our Journey” and visit Borealis, Borouge and NOVA Chemicals  
at Hall 6, Stand 6A43 to learn more.**

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#### **About Borealis and Borouge Consumer Products**

With over 50 years' experience in the industry, Borealis is an innovative and reliable supplier of superior polyolefin plastic materials used in consumer products, advanced packaging and fibre.

Superior and proprietary Borealis technologies make advanced applications possible in flexible packaging (including lamination film, shrink and protection film, stand-up pouches, food packaging); rigid packaging (caps and closures, bottles, thin wall and transport packaging); and non-woven and technical fibres (filtration systems, hygiene products, technical textiles).

These value-added packaging and fibre innovations play a role in safeguarding the quality and safety of consumer and industrial products, but also fulfill demand for enhanced functionality and convenience. Plastic food packaging, for example, helps protect and preserve food from farm to fork. Spoilage is avoided thanks to efficient filling systems and leak-resistant packaging. Food stays fresher longer, and less must be thrown away. What is more, the consumer has a wider range of choices when it comes to convenient and appealing packaging formats.

Also white goods (from washing machines to refrigerators and air conditioning units) and small appliances (from toasters to power tools) are made more robust yet lighter, more energy efficient yet visually appealing, thanks to Borealis' advanced polypropylene solutions.

#### **About Borealis and Borouge**

Borealis is a leading provider of innovative solutions in the fields of polyolefins, base chemicals and fertilizers. With headquarters in Vienna, Austria, the company currently has around 6,500 employees and operates in over 120 countries. Borealis generated EUR 7.7 billion in sales revenue and a net profit of EUR 988 million in 2015. The International Petroleum Investment Company (IPIC) of Abu Dhabi owns 64% of the company, the remaining 36% belonging to OMV, an international, integrated oil and gas company based in Vienna. Borealis provides services and products to customers around the world in collaboration with Borouge, a joint venture with the Abu Dhabi National Oil Company (ADNOC).

Building on its proprietary Borstar® and Borlink™ technologies and more than 50 years of experience in polyolefins, Borealis and Borouge support key industries with a wide range of applications in the areas of energy, automotive, pipes, consumer products, healthcare, and advanced packaging.

The Borouge 3 plant expansion will make Borouge the world's largest integrated polyolefins complex. Once fully ramped up in 2016, the additional 2.5 million tonnes of polyolefins capacity will yield a total Borouge capacity of 4.5 million tonnes, and a combined Borealis and Borouge capacity of 8 million tonnes.

Borealis offers a wide range of base chemicals, including melamine, phenol, acetone, ethylene, propylene, butadiene and pygas, servicing a wide range of industries. Borealis also creates real value for the agricultural industry, selling approximately 5 million tonnes of fertilizers. Technical nitrogen and melamine products complement the portfolio with applications ranging from mono-nitrogen oxide (NOx) abatement to glues and laminates in the wood working industry.

Borealis and Borouge aim to proactively benefit society by taking on real societal challenges and offering real solutions. Both companies are committed to the principles of Responsible Care®, an initiative to improve safety performance within the chemical industry, and work to solve the world's water and sanitation challenges through product innovation and their Water for the World™ programme.

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**For more information visit:**

[www.borealisgroup.com](http://www.borealisgroup.com)

[www.borouge.com](http://www.borouge.com)

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