

CASE STUDY

Packcycle project is expanding the range of possible industrial flexible packaging applications

Now containing higher levels of post-consumer recyclate (PCR)



EverMinds™

Accelerating Action
on Circularity



BOREALIS

بروج

Borouge





Value chain cooperation yields more circular HDSS, top sheets and stretch hoods

The Packcycle story begins

In 2020, Borealis and Ecoplast, a member of the Borealis Group, launched Packcycle, a project dedicated to improving the circularity of the industrial packaging used to transport and distribute Borealis own products. The plastic sheets used in pallet packaging were the first target application.

After extensive testing and trial runs, Ecoplast PCR LDPE Borcycle™ NAV101L and NAV101 proved to be the ideal solution for this kind of application. These mechanically recycled low density polyethylenes (LDPE) offer the perfect balance between technical requirements and processability. Additionally, these transparent recyclates are 100% PCR-based, derived in large part from municipal and household waste. To produce the bottom sheet, a blend of NAV101 and the Borealis virgin polyethylene booster, BorShape™ was used.

The next chapter: expanding the range of more circular industrial packaging

Since our ultimate aim was to improve the circularity of industrial packaging for both us and our customers, the next step in the Packcycle project was to incorporate and maximize the PCR content in additional pallet packaging applications. Maintaining product material specifications and safety compliance was essential. Another key factor was to ensure that the plant packing lines can change seamlessly from virgin polyolefins to formulations incorporating PCR.

Collaborative development draws on know-how from each partner

Borealis and Ecoplast reached out to multiple customers, inviting them to co-develop new material formulations for individual packaging components which would meet their specific market needs. Focus applications included heavy-duty shipping sacks (HDSS), top sheets and stretch hoods as complements to the recently developed plastic sheets. The requirements for each packaging component were determined separately in order to maximize the amount of PCR content for each while at the same time maintaining excellent mechanical properties. Several formulations were produced in test runs at the customers' production lines, then tested in the labs by both Borealis and customers. As a final step, the new formulations that had been selected underwent industrial tests at Borealis plants.

Along with the virgin booster BorShape™, Ecoplast PCR LDPE NAV101 again proved its suitability for most of the focus applications.

HDSS in two variations, one made with 30% and the other with 70% PCR content

- Fulfills requirements for seal strength and hot tack (for example during filling and sealing), puncture and drop resistance in handling, and creep resistance for pallet stability and safe storage in all conditions.

Top sheet made using 80% PCR

- Provides weather protection, puncture and tear resistance to the content in the HDSS.

Bottom sheet made of 80% PCR

- Provides protection from moisture and contaminants coming from the ground or floor.

Cover hood incorporating 70% PCR

- Offers protection from the elements, and ease of application.

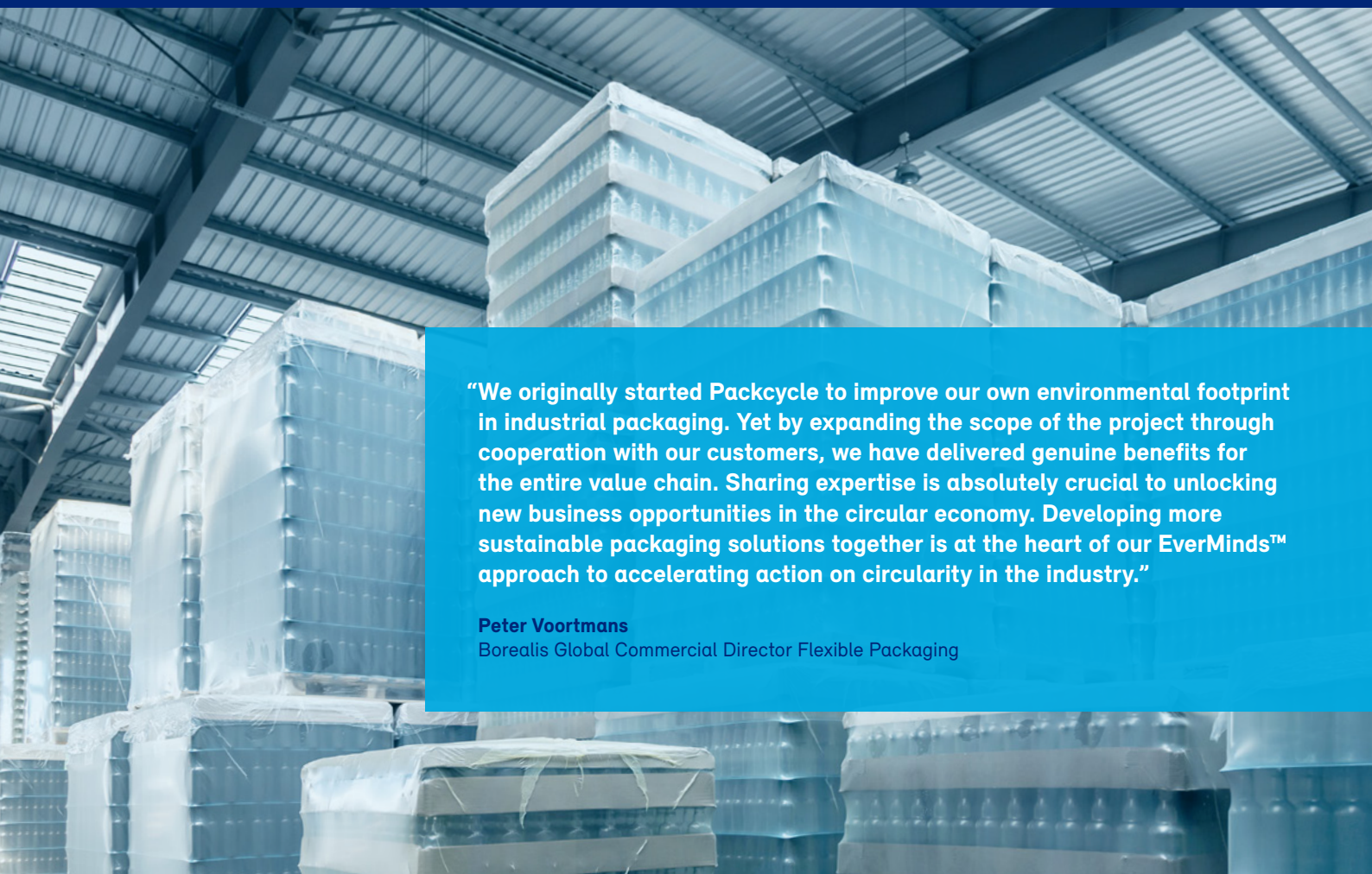
The **stretch hood** application contains 45% of a newly developed PCR grade based on LLDPE waste. This grade delivers a stretch hood which is easy to apply on automatic packing lines. It offers excellent elasticity, homogeneous deformation during pre-stretch and recovery; tear resistance during and after application of the hood; high holding force; and overall excellent protection of the palletized goods



Mutual benefits of more sustainable pallet packaging methods

At Borealis and Ecoplast, we are now using primarily PCR-based industrial packaging in our own operations for non-prime grades. This allows us to offer our customers these more sustainable packaging options as well. The same high film performance can be obtained while reducing use of virgin polyolefins in pallet packaging. Together, we are accelerating the transition to a circular economy of plastics by helping minimize the end-of-life landfilling and incineration of plastics.

In the Packcycle project, considering the average PCR content of all packaging that have been re-designed, around 650 t of virgin material are substituted by PCR per year.



“We originally started Packcycle to improve our own environmental footprint in industrial packaging. Yet by expanding the scope of the project through cooperation with our customers, we have delivered genuine benefits for the entire value chain. Sharing expertise is absolutely crucial to unlocking new business opportunities in the circular economy. Developing more sustainable packaging solutions together is at the heart of our EverMinds™ approach to accelerating action on circularity in the industry.”

Peter Voortmans

Borealis Global Commercial Director Flexible Packaging

Borealis and Borouge packaging solutions are making everyday life easier

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Borealis is one of the world's leading providers of advanced and sustainable polyolefin solutions. In Europe, Borealis is also an innovative leader in polyolefins recycling and a major producer of base chemicals. We leverage our polymer expertise and decades of experience to offer value-adding, innovative and circular material solutions for key industries such as consumer products, energy, healthcare, infrastructure and mobility.

With operations in over 120 countries and head offices in Vienna, Austria, Borealis employs around 6,000 people. In 2022, we generated a net profit of EUR 2.1 billion. OMV, the Austria-based international oil and gas company, owns 75% of our shares. The Abu Dhabi National Oil Company (ADNOC), based in the United Arab Emirates (UAE), owns the remaining 25%.

In re-inventing essentials for sustainable living, we build on our commitment to safety, our people, innovation and technology, and performance excellence. We are accelerating the transformation to a circular economy of polyolefins and expanding our geographical footprint to better serve our customers around the globe. Our operations are augmented by two important joint ventures: Borouge (with ADNOC, headquartered in the UAE), and Baystar™ (with TotalEnergies, based in the US).

borealisgroup.com | borealiseverminds.com

Borealis AG

Trabrennstr. 6-8, 1020 Vienna, Austria
Tel +43 1 22 400 000 - Fax +43 1 22 400 333
borealisgroup.com

Borouge Pte Ltd Sales and Marketing Head Office
1 George Street 18-01, Singapore 049145
borouge.com

