



EverMinds™

Thinking Circular



Borealis' approach towards a more circular economy in the appliance business.

Plastic use has increased twenty-fold in the past 50 years due to its excellent properties and benefits, such as functionality, durability and versatility. But since becoming indispensable in appliances, approximately 1Mt of plastic waste is now generated every year.

To make sure these products avoid landfill, Borealis promotes the development of a circular economy through three key principles:

1. Preserving and enhancing natural capital
2. Circulating products, components and materials at their highest utility
3. Creating only minimum waste and pollution

By enhancing material effectiveness through reuse, recycling and alternative feedstock, we can ensure the circularity of plastic. This means better environmental and economic outcomes while continuing to harness plastic's many benefits.

How we deliver sustainable solutions to meet the appliance industry's needs.

Building on the three key principles, Borealis has identified seven ways to help transition from a linear to a circular economy in appliance manufacturing.



Innovation

Resources need to stay in the use phase for as long as possible to ensure maximum efficiency. This is true for both virgin and recycled plastics (embedding the latter should not compromise the service life of the appliance product).

- Innovative recycled product solutions ensure appliances have the longest possible service life. Initially recycled plastics are used for non-structural and non-visible parts. Recycled solutions that meet demanding mechanical requirements (high loads and impact performance, detergent resistance etc.) and / or aesthetical properties, are needed to further increase the recycle uptake. This requires advanced mechanical recycling and / or chemical recycling technologies.

Products designed to eliminate the use of chemicals of concern (absence by design principle).

- Borealis takes a precautionary approach to substances that are under assessment by regulatory authorities due to potential health or environmental risks, e.g. Borealis has developed non-halogen flame retardant solutions.

Product compliance statements and documentation to facilitate upscaling and commercialisation for products with recycled content.



Design for Circularity (DfC)

DfC is essential to reduce the environmental impact of products over their entire lifetime (including production, use phase and after phase), and to maximise material effectiveness. Appliances must be designed in such a way that plastic parts can be dismantled, and are easy and cost efficient to replace and / or repair, then recycle:

- DfC means making intelligent material and design decisions so products, or their parts, can be reused as well as collected, sorted and recycled efficiently.
- Reuse is preferred over recycling in waste legislation (hierarchy). Borealis supports refurbishment of appliances because it encourages reuse. It does, however, require a fundamental redesign of products.
- Design for recycling (DfR) enables easy dismantling, sorting and recycling of the plastic parts. Borealis has developed 10 Codes of Conduct for DfR of packaging and supports the clear labelling of parts to enable easier dismantling.



End-of-life

The right end-of-life plans are in place to finance circularity. Borealis supports the development of proper end-of-life protocols to ensure there are schemes to collect, sort and recycle appliance plastic parts at the very end of service life.

Sorting is vital in achieving a segregated and more homogeneous, therefore better quality & consistent, recycled plastics feedstock. EPR and other incentive schemes will drive recyclability and recycled uptake.



Bio-based feedstock

Borealis assesses emerging bio-based feedstock with the entire life cycle in mind. This is in order to understand and balance its economic, environmental and social impacts vs. fossil feedstock:

- Although the climate impact of bio-based plastics scores better than fossil fuels, other factors clearly score worse, such as: deforestation, competition on land use for food crops, land acidification / eutrophication and water consumption, and significantly higher production costs.
- Plastics produced from first generation bio-based feedstock can raise fundamental societal issues, such as competition with food crops, which leads to increases in food prices. By 2030, the planet will need 50% more food and Borealis plays a role in addressing this challenge.
- Borealis invests in second generation bio-based feedstock solutions as a valuable option if its impact on the environment, society and business is clearly superior to fossil fuels. Second generation feedstock does not compete with food supplies and has a lower climate impact.
- Mass balance allocated bio content should be treated as the equivalent to directly allocated recycled content.
- Borealis supports the preparation of a regulatory framework or widely accepted standards, accommodating the use of bio-based feedstock.



Packaging

It is our aim to reduce the amount of disposable packaging material and consider returnable packaging systems. We also work to reduce waste in the supply chain (broken appliances) by developing packaging innovations:

- A large amount of disposable packaging (PS foam, carton board and boxes, wood and plastic film) is used in the supply chain of appliances and is growing with the increased importance of e-business.
- Damage to appliances along the supply chain has increased, surpassing 5%, causing significant economic losses and environmental impact.
- Development of innovative packaging solutions can address these challenges.



Digitalisation

Borealis supports the development of digitalisation to manage the product chain of custody:

- Cost of managing information can be reduced significantly through digitalisation (e.g. blockchain technology) and help to capture the value of waste.

“Driving the transition of the appliance industry from a linear to a circular economy.”



Collaboration

Collaboration with value chain partners and other stakeholders is fundamental to the success of a circular economy:

- Borealis has developed a strategic framework to stepwise move its polyolefin business towards a circular economy, initially focusing on the commercialisation and proliferation of mechanical recycling. Other technologies are being assessed, such as solvent-based and chemical recycling, based on life-cycle assessments.
- Active membership in associations such as the Polyolefin Circular Economy Platform, CEFLEX and the Ellen McArthur Foundation, help to direct and drive the transition of the industry from linear to circular. Borealis has signed the Foundation's Global Commitment “A Line in the Sand”, one of only two producers invited to do so.

“Reducing the environmental impacts and maximising the effectiveness of materials in appliance manufacture.”

EverMinds™

Thinking Circular

Launched in 2018, EverMinds™ is an umbrella brand uniting the wide range of Borealis activities and initiatives aimed at making plastics more circular. As a dedicated platform, EverMinds promotes a circular mind-set among all Borealis stakeholders.

The platform encompasses proprietary Borealis technologies as well as established brands such as Purpolen™ and Dipolen™. It facilitates deeper collaboration between Borealis and its partners in order to develop innovative and sustainable polyolefins solutions based on the circular model of recycling, re-use and design for circularity. EverMinds also extends to pioneering corporate programmes such as Project STOP,

and engagement in industry initiatives like the the Polyolefins Circular Economy Platform (PCEP), and Project CEFLEX.

Because thinking circular today will provide us, our partners and society with a better tomorrow.

For more information:

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Borealis is a leading provider of innovative solutions in the fields of polyolefins, base chemicals and fertilizers. With its head office in Vienna, Austria, the company currently has around 6,600 employees and operates in over 120 countries. Borealis generated EUR 7.5 billion in sales revenue and a net profit of EUR 1,095 million in 2017. Mubadala, through its holding company, owns 64% of the company, with the remaining 36% belonging to Austria-based OMV, an integrated, international oil and gas company. 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). www.borealisgroup.com

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