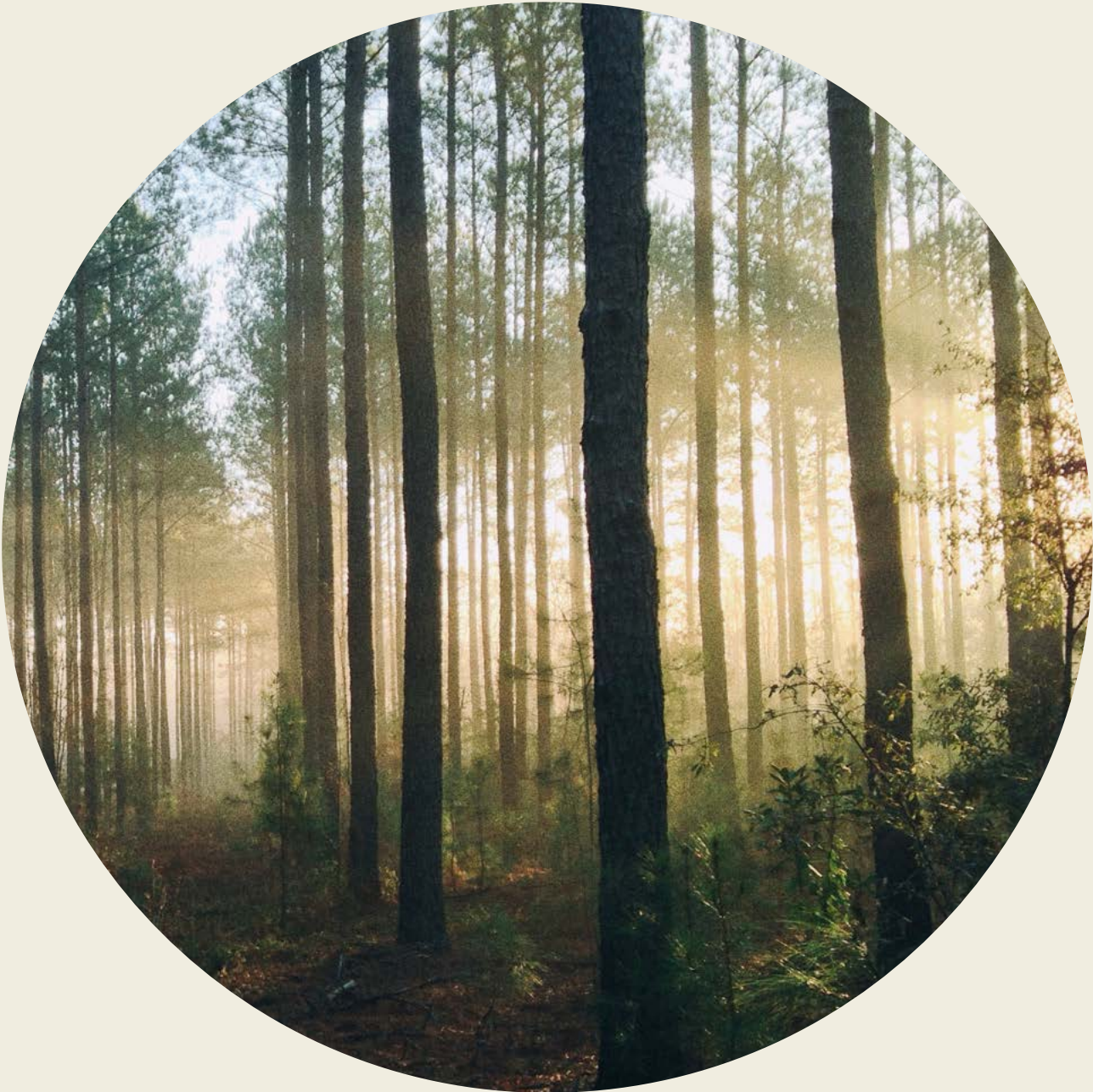


# Solvitose Greenmelt

A green solution that binds.



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# Whitepaper Solvitose Greenmelt.

## You can't see the difference but the future does.

**Implementing sustainable solutions in every aspect of a packaging product is desirable yet challenging. Most consumers are unequivocally conscious of their day-to-day impact on the environment, and they let that be known with their buying decisions.**

They seek a packaging solution that is recyclable, sustainable, and biodegradable. The industry can make its packaging more sustainable, whether that is for clothing, food, or other industrial purposes.

Royal Avebe believes in the industry's power to make packaging more sustainable and is here to support and provide part of the solution that is good for producers, consumers, and the planet. We do this by using potatoes, an environmentally sound and natural source, and from that we have developed Solvitose® Greenmelt. Avebe's Solvitose® Greenmelt is a food grade, fast setting starch-based adhesive, which contributes to a 100% compostable, biodegradable packaging.

Read on to discover today's current trends in sustainability, the challenges the industry faces, and how Royal Avebe can support you with the solution.

### Consumer Opinions on Sustainability

Sustainability as a concern within packaging is a growing issue. Especially at the consumer level, interest in sustainability has surged and the awareness of the circular economy is gaining traction, bringing attention towards sustainable packaging.

This attitude only continues to grow as we look at the next generation.

More than six in ten respondents (61%) under the age of 30 strongly agree that "we as a society should respond to climate change with the same urgency" as was done to the health pandemic. 65% of next-gen respondents say they "feel guilty about my negative impact on the environment."<sup>1</sup>

These insights are not just abstract figures: they influence the behaviour and choices of consumers directly. 67% of consumers now identify as environmentally aware and that same amount believe it is important that the products they buy are in packaging that is recyclable.<sup>2</sup>

Major industries have started making the shift. Swedish furniture giant IKEA has stated its ambition to transform into a circular business by 2030 using in-store initiatives to engage its customers including recycling, remanufacturing and reusing products.<sup>3</sup>

From their own reports, glue contributes 5% to the total climate impact of IKEA and with a company their size that is significant, which is why they are working to convert from fossil-fuel to bio-based glues.<sup>4</sup>

**"97% biodegradable after 28 days."**

<sup>1</sup> GLOBESCAN 2020

<sup>2</sup> Trivium 2021

<sup>3</sup> Idle 2021

<sup>4</sup> IKEA Sustainability Report FY21

**“With 73% of consumers willing to pay more for eco-friendly packaging, the data demonstrates that not only is the demand to make a change necessary, we now have the power to do so.”**



# How do consumers perceive sustainability?

When concerning packaging it is technically defined as having a relatively low environmental impact based on life-cycle assessments.<sup>5</sup> When it comes to the consumer, “eco-designed packaging can be defined as a design that evokes explicitly or implicitly the eco-friendliness of the packaging via its structure - e.g.; materials, reduction or removal, recyclability, biodegradability or reusability - , its graphical/iconographic cues - e.g.; colors, images/pictures, logos - or its informational cues - e.g.; claims, carbon footprints.”<sup>6</sup>

The evidence supports that consumers act on their ideology. According to the 2021 Buying Green Report, which is based on a survey of more than 15,000 end consumers across Europe, North America and South America, most consumers will “refrain from or hesitate to buy a product that they regard as being harmful to the environment.” A majority of which look for information on the recyclability and sustainability of the packaging of the products they buy.<sup>7</sup>

Paper in particular is perceived as an environmentally friendly material. It has the distinct advantage of being biodegradable and recyclable. The opportunity for more of its use in food packaging, increasing paper and reducing polymer, is apt, but with that comes the material adjustments that satisfy the needs of the product and manufacturers.



<sup>5</sup> Glavič, Peter & Lukman, Rebeka, 2007

<sup>6</sup> Magnier, Lise & Crié, Dominique, 2015

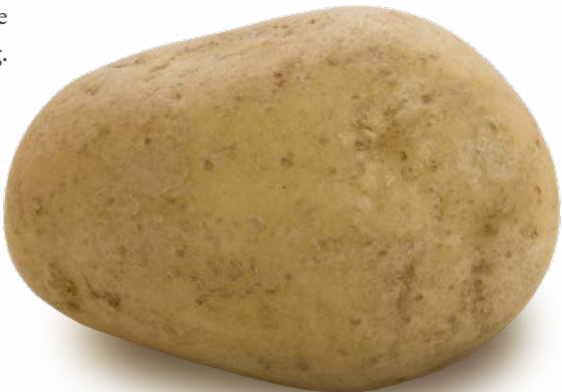
<sup>7</sup> Trivium 2021

# The Potato

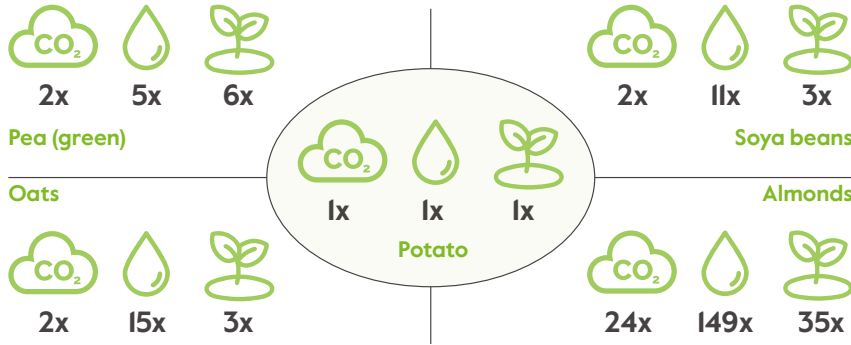
The potato is one of the most environmentally friendly and sustainable crops to grow. At Avebe, we are all about potato ingredients. We extract everything we can from the potato and put it to good use and have been doing so for over 100 years.

One of the many great benefits from using potatoes is that it can result in a product that is 100% natural. The potato is the planet’s most versatile crop. Technically, they can even grow on Mars. They pack up to four times the calories per acre of corn. They feed a billion people every day. And since they are less vulnerable to climate change and less responsible for it, they could provide nutrition for even more. But it goes beyond nutrition: by learning how to harness their starch and proteins, Avebe researchers have continuously unlocked exponentially bigger gains. One of these products is a unique adhesive derived from potato starch we call Solvitose® Greenmelt.

Solvitose® Greenmelt is a novel water-based starch adhesive to obtain a total green adhesive. This means that by using the Solvitose® Greenmelt adhesive, the manufacturer contributes towards 100% compostable, biodegradable packaging.



Did you know that potatoes are the most sustainable choice compared to other crops?



Usage compared to potatoes: ☁️ CO<sub>2</sub> emissions | 💧 Water use | 🌱 Land area  
 Source: Blonk Consultants

# Solvitose Greenmelt

Avebe's Solvitose® Greenmelt is a patented starch-based adhesive with dual bonding principle: gelling followed by drying. Applications include (food) packaging, gummed and tamper proof tapes, and much more. At elevated temperatures one can apply it as a traditional liquid adhesive or as a hotmelt. After drying, the adhesive film is water remoisstable and heat pressure sealable.

It's repulpable, recyclable, biodegradable and compostable, all the while maintaining a food grade status. One hopes you can imagine the possibilities.

If you are producing a vegan, healthy, green-label food, with Solvitose® Greenmelt you are now contributing to a 100% compostable, biodegradable packaging.

**“Improved sustainability by delivering perfect heat stability”**



**“Improved sustainability by delivering perfect heat stability without the use of harmful antioxidants, which are often environmentally unfriendly, damaging to workers’ health, and reduce biodegradability.”**





## Case Study I:

# Hotmelt application system

## Challenge

Hotmelt solutions are applied in large doses to ensure that the open time is sufficiently long enough to achieve good bonding. Overdosing adhesive is expensive in terms of cost-in-use as well as energy expenditure to keep the hotmelt mass warm enough for processing. Besides, it is also not sustainable.

The challenge is to create an adhesive that is economical, easy to process and eco-friendly.

## Our solution

Due to the longer open time of Solvitose® Greenmelt, the amount of adhesive applied can be significantly reduced whilst good bonding is still guaranteed. Reduction of the adhesive amount applied can easily be achieved with the use of a micro dots jetting nozzle.

## Benefits

Usage of significantly less adhesive makes it an easy to process and cost-efficient adhesive for packaging.

## Challenge

Are currently used hotmelt application systems suitable for Solvitose® Greenmelt?

## Our solution

Yes, by lowering the temperature and using a needle nozzle you are saving energy and costs.

In cooperation with Robatech, the suitability of hotmelt application systems for Solvitose® Greenmelt was evaluated. With Solvitose® Greenmelt the adhesive amount can be significantly reduced compared to traditional hotmelts so a microdots jetting head is used.

When working with gelled blocks of Solvitose® Greenmelt melting is easy and fast.

## Benefits

Only a small adaptation, such as a different nozzle, is required to adjust your application system.



**Figure 1:** Blocks of gelled Solvitose® Greenmelt in the tank at 95°C (left initial, middle after 3 minutes, right after 8 minutes). Optimal settings depend on the dry solid content of Solvitose® Greenmelt. In this study we evaluated a solution with 53% and 55% refraction. With the following settings: Tank 95°C, Hose 97°C, Jetting head 98°C, Adhesive pressure 4 bar (53%) or 3 bar (55%), Jetting head type: SX Diamond, needle nozzle an excellent application and run ability was achieved.



**Figure 2:** Solvitose® Greenmelt microdots of approximate 3 mg each.

## Case Study 2:

# Colour stability at heat storage

## Challenge colour stability

To develop a compostable adhesive that does not need antioxidants to prevent it from discolouring at prolonged heat storage, unlike traditional hotmelts.

## Our solution

A Solvitose® Greenmelt solution is perfectly heat stable and remains transparent to the eye at hot storage in an adhesive layer of 160 µm without the use of antioxidants.

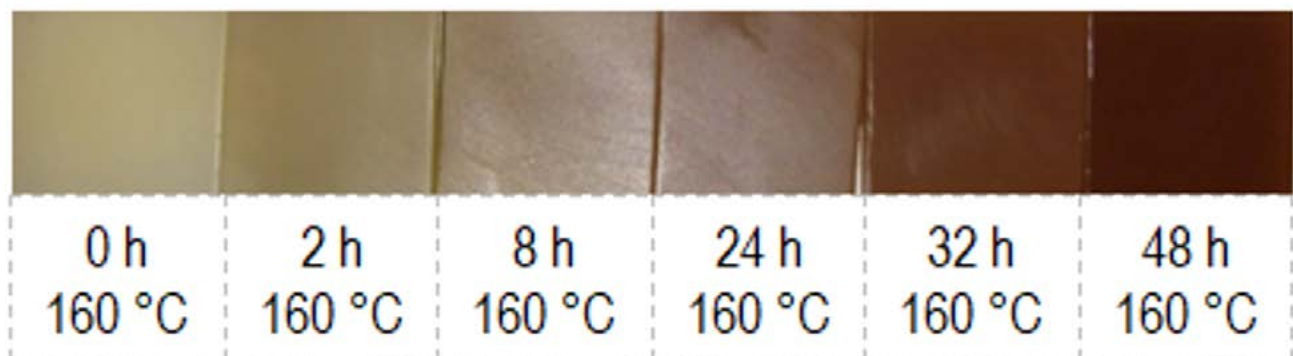
## Benefits

Improved sustainability by delivering perfect heat stability without the use of harmful antioxidants, which are often

environmentally unfriendly, damaging to workers' health, and reduce biodegradability.

This case study demonstrates how Solvitose® Greenmelt can be applied to your existing hotmelt application systems. Other advantages Solvitose® Greenmelt are that you need less because of its longer open time and since it only requires 90°C, this could potentially provide significant savings in energy costs.

But is Solvitose® Greenmelt truly biodegradable? To answer this question, keep reading.



*Traditional hotmelt*



*Solvitose Greenmelt\**

\* Stored in a closed jam jar.

# Case study 3: Biodegradability

## Challenge

To create an easy biodegradable / compostable adhesive contributing to the desire of packaging manufacturers and society in general-to strive towards 100% compostable packaging.

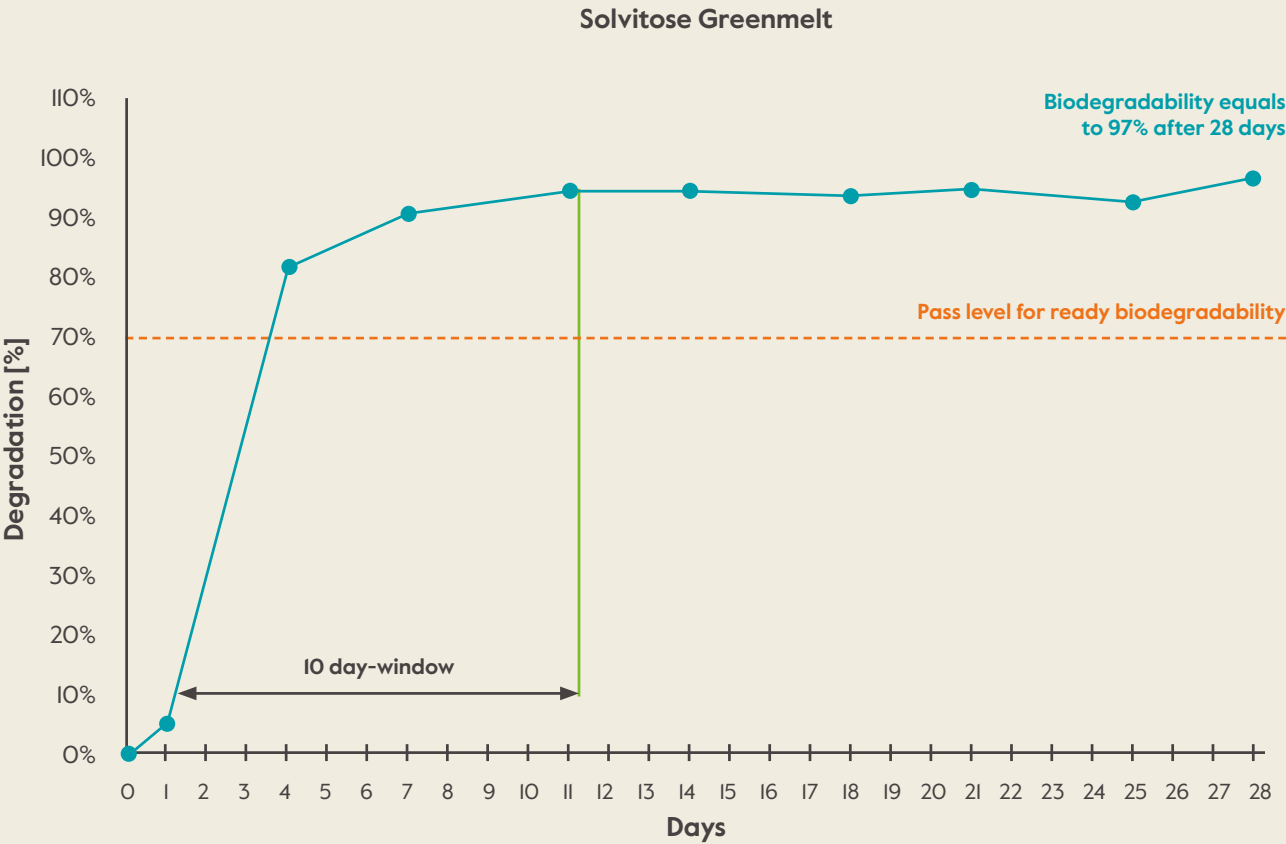
## Our solution

Eurofins France evaluated the biodegradability of Solvitose® Greenmelt following the OECD301A guideline, concluding that Solvitose® Greenmelt is considered as readily

biodegradable since the diminution threshold of DOC of 70% is reached in the 10-day window interval, and that it is biodegradable at 97% after 28 days of the test.

## Benefits

Solvitose® Greenmelt is a readily biodegradable adhesive that contributes to the development of recyclable and compostable packaging.



[Click here to obtain the full biodegradability report.](#)

# The Future

With 73% of consumers willing to pay more for eco-friendly packaging, the data demonstrates that not only is the demand to make a change necessary, but we also now have the power to do so.<sup>8</sup>

When we look at consumers under the age of 30, the data is overwhelming. A third believe that companies and their brands are an essential part of the solution when concerning today's issues. 44% strongly agree they try to support companies and brands that have a purpose of making a positive difference in society through their products, services and operations.<sup>9</sup>

Will you choose to become a brand leader? Reducing the environmental impact of your product should be everybody's goal. It is inevitable. You can wait until the market forces your hand or you can lead the way.

Watch this video to witness how quickly Solvitose® Greenmelt immerses into nature. Contact us for more information.

**“When we look at consumers under the age of 30, the data is overwhelming. A third believe that companies and their brands are an essential part of the solution when concerning today's issues.”**



<sup>8</sup> Trivium 2021

<sup>9</sup> GLOBESCAN 2020

# Royal Avebe

## your knowledge partner to make it happen.

Innovation by nature has been driving Avebe for the last 100 years. We consider every part of the value chain, and we continue to innovate in a sustainable way. The challenges of the environment, of the culture, and changing consumer behaviour helps motivate and drive this innovation. Changes do demand adjustment, in either technology or attitudes.

Can you obtain a natural and clean label product, from the ingredients to the packaging, while still maintaining the original's quality and performance?  
Can you implement a packaging innovation in your factory and maintain the same level of output?

Avebe recognizes that these challenges are significant and is here to support you in your transition towards a fully sustainable, recyclable, or biodegradable packaging solution, using the benefits of unique properties of the potato based Solvitose® Greenmelt. This is a process of co-creation and collaboration, as well as building upon our knowledge on product development. Utilise our knowledge on how to ensure that you reach a 100% sustainable solution. We are here to help you design the best product formulation and integrate it in your process. We are looking for leaders eager to adopt the most innovative solutions and help make the world a better place.

Are you looking to satisfy your sustainability goals, court the newest generation of consumers and are interested in a sustainable adhesive? We at Avebe have the solution. Reach out to an Avebe expert today.



**“A third of consumers believe brands are an essential part of the solution in today’s issues.”**

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“Eurofins France evaluated the biodegradability of Solvitose Greenmelt, concluding that it is biodegradable at 97% after 28 days of the test.”



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