

Circular food & distribution packaging materials

Background

BASF, Amazon, and Prego are working together to catalyze industry-wide demand for circular packaging materials (e.g., renewable, recyclable, biodegradable) as an alternative to conventional plastics. BASF brings its expertise in polymer and dispersion chemistry, enabling the development of advanced materials. Amazon contributes its innovations in novel materials looking for ways to replace conventional plastics, focusing on solutions that meet consumer demand, as well as retail channels to test these materials.

Meanwhile, Prego excels in creating innovative packaging and protective solutions that enhance product safety and performance. Together, we aim to drive transformative advancements in packaging that benefit both our industries and the environment. Sustainable packaging alternatives currently on the market (e.g., biopolyester materials) do not perform as well as conventional plastics in many applications and have faced a cost barrier to broad adoption. We aim to find solutions which address current food packaging performance issues, mainly moisture barrier and mechanical properties such as puncture resistance, tear resistance, and tensile strength. We are interested in material solutions for food packaging applications, including snack food packaging, frozen food packaging, and bagged produce packaging. We are also interested in solutions for produce bags, outbound product packaging, and polybag replacements.

What we're looking for

We are interested in biodegradable materials that can be used in barrier layers, adhesives, and additives to provide a moisture barrier and mechanical properties required by the intended packaging applications. This could include biopolyesters that may also perform as stand-alone films. The ideal materials are biodegradable and/or compatible with existing recycling streams. We are seeking solutions that address the high cost and performance challenges of biopolyesters currently on the market. This may include alternatives to polyethylene such as PHA, seaweed-based materials, or cellulose films. We are looking for solutions that either reduce the high production cost of biopolyesters or address their current performance challenges. We are particularly interested in biodegradable materials for use in barrier layers, adhesives, and additives that can confer biopolyesters with the moisture barrier and mechanical properties needed for the intended packaging applications.

Solutions of interest include:

- Coating or co-polymerization
- Biodegradable additives (that accelerate biodegradability or composability)
- Multilayer biopolyester films
- Analogous novel materials (biobased plastics)
- Cross-linking of biopolymers

Our must-have requirements are:

- Integrates into recycling or composting infrastructure, and poses no environmental hazard if entering waste streams
- Clear pathway to commercialization regarding mass production
- Benchmarked against traditional polyethylene packaging for moisture-barrier and mechanical performance required in intended application
- Properties that fit into a circular economic model for packaging materials (biodegradability and recyclability)

Our nice-to-have's are:

- Addresses the high cost of biopolyesters
- Manufactured within existing infrastructure, for example, paper milling, paper coating, and film extrusion processes

What's out of scope:

- Designed to go to landfill
- Oxo-degradable
- Requires scarce or unsustainable feedstocks

Acceptable technology readiness levels (TRL): Levels 3-9

1. Basic principles observed
2. Concept development
3. Experimental proof of concept
4. Validated in lab conditions
5. Validated in relevant environment
6. Demonstrated in relevant environment
7. Regulatory approval
8. Product in production
9. Product in market

What we can offer you**Eligible partnership models:**

- Sponsored research
- Co-development
- Material transfer
- Licensing

- Supply/purchase
- Equity investment

Benefits:**Sponsored Research**

Minimum of \$50k funding for a project.

Expertise

Partners will have access to internal team/experts as appropriate.

Tools and Technologies

Scale-up opportunities with packaging manufacturers (Pregis Innovative Packaging).

Facilities and Services

Partners can send samples for specific analysis at our facilities. Potential access to BASF's Center of Excellence for Biodegradation, including testing, research collaboration, and scientific support.

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