

Private Company 

Color care and textile strength solutions for laundry products

 MATERIALS

Background

Laundry products, including detergent and fabric finishers, should not only remove dirt but also deliver comprehensive textile care. This includes color care, anti-greying and enhancing longevity of textiles by improving dye/color fixation, pilling resistance, softness, moisture management, wear comfort, fiber strength, elasticity, and dimensional stability.

One overarching goal is the protection of fibers to prevent breakage. During the laundry process, fibers become thinner, ultimately leading to holes in textiles. Common solutions, such as the use of cellulase enzymes, primarily work to remove fuzz and reduce pilling and friction between fibers on cotton fabrics. However, this process does involve some degradation of the cotton fibers, which can counteract the goal of preventing fiber breakage. Moreover, cellulase enzymes are not effective on other consumer-relevant textiles like polycotton, synthetics, and fine fibers such as silk and wool.

Another goal is ensuring color care without compromising sustainability and fabric strength, as colors often fade and leach due to multiple wash and wear cycles. Current polymeric solutions available in the market typically work only on specific colors and types of textiles. For instance, a copolymer of 1-vinylimidazole and 1-vinyl-2-pyrrolidone works only on red color. Additionally, these polymers are mainly fossil-based and not biodegradable. Effective, environmentally friendly solutions for consumer-relevant colors such as red, black, and indigo (blue) are currently lacking.

We are thus interested in exploring new technologies and chemistries for fiber coating, fiber protection, and improving dye performance, as well as achieving a renewing effect. This includes technologies for better dye fixation (ensuring dyes adhere more effectively to fibers) and dye inhibition (preventing dye from washing out or fading). Technologies from adjacent fields such as textile treatment, waste treatment, natural fibers, and material science are also of interest.

What we're looking for

We are looking for innovative technologies to be incorporated into laundry products in the following areas: 1) Color/dye fixation: solutions that help to keep the color of textiles, avoiding color fading and color transfer; 2) Renew effect: solutions that maintain the appearance of new textiles for a longer period and improves the condition of damaged textiles, not only in cotton but also in other synthetic fabrics; and 3) Textile strength: solutions that increase the strength of fibers and/or their resistance to damage and wear, as well as reduce inter-fiber friction.

Solutions of interest include:

- Treatments that maintain the appearance of new textiles for longer and give older textiles a renewed effect after a maximum of 5 washing cycles.
- Coatings that protect the textile from environmental damage and wear.
- Treatments that make textiles repel substances like oil or dirt.
- Fiber/textile bonding to improve textile strength and integrity.
- Dye/color transfer inhibition treatments that prevent dye or color from transferring from one fabric to another during washing.
- Dye/color fixation treatments that improve the adherence of dyes to fibers and prevent color fading.

Our must-have requirements are:

- Solutions should ultimately be effective in in-wash applications at 30°/40° C.
- Solutions should be suitable for incorporation in detergent or fabric softener/finisher formulations.
- Solutions should be compatible with common detergent ingredients, e.g. enzymes, surfactants, builder, fragrances, etc.

Our nice-to-haves are:

- Solutions that use renewable feedstocks in their chemistry and ingredient composition.

What's out of scope:

- Solutions that are not biodegradable.
- Laundry additives, e.g. sprays before or after wash.
- Solutions that negatively affect the fragrances/perfumes used in detergents.
- Solutions that negatively impact the overall wash performance and textile properties.
- Solutions that contain cellulase enzymes since these are well-known.

Acceptable technology readiness levels (TRL): Levels 3-7

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:

- **Co-development**
- **Sponsored research**
- **Supply/purchase**
- **Licensing**
- **Material transfer**

Benefits:

Sponsored Research

Funding is proposal-dependent starting with a feasibility study or proof-of-concept, up to \$100,000 with the potential for expansion based on results and opportunities

Please contact the University of South Florida Technology Transfer office representative for submission – Karla Schramm at kschramm@usf.edu.