



## FREQUENTLY ASKED QUESTIONS

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### What is PROTĒAN®?

PROTĒAN offers patented, eco-friendly solutions to help eliminate persistent chemistries, such as plastic coatings and fluorocarbons, used by pulp, paper and packaging manufacturers and specialty chemical companies. This plant-based derivative can be used as a barrier coating or as an additive in paper-making. This technology is a cost-effective, alternative solution to existing barrier coating solutions as it renders paper packaging recyclable, biodegradable and compostable under ambient conditions.

### What does PROTĒAN do?

We have developed two PROTĒAN variations that can be applied as barrier coatings or used as additives during paper-making. There is PROTĒAN Water Barrier- that can be used to create paper-based products with water-resistant properties and there is PROTĒAN OGR Barrier- that can be used to create paper-based products with oil and grease resistant properties. Since PROTĒAN is plant-based, it allows the base paper to remain biodegradable while providing properties required for packaging and specialty paper applications.

### How does PROTĒAN work?

PROTĒAN molecules bond together to give paper-based products a water-resistant and/or grease-resistant barrier coating. Not only does PROTĒAN serve as a surface barrier coating, it also lends strengthening properties to the cellulose fibers by interlacing into and reacting with the paper matrix. Since there are no synthetic chemicals, the molecules can easily be recycled with the paper when they are disposed of. Unlike PLA, the paper-based materials coated with PROTĒAN will also biodegrade and compost without the need for special conditions. Moreover, PROTĒAN is unique as it is non-toxic and will not contaminate downstream processes.

### What is the difference between biodegradable and compostable?

Biodegradable means the product will be naturally broken down by microorganisms allowing the materials to decompose in the environment. Compostable means the product is made from organic matter that will break down into a pile of nutrient rich soil.

### We already use a lot of paper products. Aren't they all biodegradable?

Many products today are labeled as biodegradable. However, when the base paper is coated or treated with certain chemicals, the chemicals interfere with the paper's ability to degrade naturally and quickly. These chemicals, including plastic coatings, fluorochemical treatments and silicone, require special facilities for recycling or composting and they require unique conditions for them to fully biodegrade. We are introducing PROTĒAN to help the environment free itself from the toxins caused by plastic debris.

### Can't we just recycle all the plastic we use?

Unfortunately, no. Plastic that is used on certain materials cannot be separated by regular recycling. A perfect example is the disposable paper coffee cup - the plastic coating is so thin and tightly applied to the paper that it is nearly impossible to separate the paper from the plastic and not contaminate the resulting fiber stream using conventional recycling equipment. These cups end up in a landfill where, if the conditions are right, they will take several decades to decompose while leaving behind some micro-plastic residuals. PROTĒAN is a new solution that can serve as an alternative for the plastic coatings we use today.

### What are fluorochemicals and how are they used in paper products?

Fluorochemicals are synthetically produced chemicals that allow paper-based products to have greaseproof capabilities. However, research has indicated that these synthetically produced chemicals have difficulty breaking down within the human body and cannot naturally biodegrade in the environment. PROTĒAN products are fluorine free.



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### Can PROTÉAN® coatings be used for hot or cold packaging?

Yes. PROTÉAN coated paper can be used for hot or cold food packaging. Please visit our Applications page to see the various applications we have explored to date. Please contact us if you have any questions.

### Does PROTÉAN require any special equipment for application?

No. PROTÉAN can be applied using curtain coating, size press applicators, and rod or blade metering coating equipment. It is scalable and adaptable by most commercial paper mills and can run up to 20% faster than some of our competition.

### Do PROTÉAN coatings require any specialized conditions for drying?

No. Outside of heating, no other processes, such as UV exposure or other chemical addition, are required for PROTÉAN.

### Can PROTÉAN coatings be added to furnish or paper?

Depending on the final use, PROTÉAN can be added to pulp, furnish or paper. When used as a coating, it can also be applied before or after printing.

### What is the specific weight of the PROTÉAN coatings?

The specific weight is similar to plastics. Therefore, unlike PLA, you don't need to add as much PROTÉAN to a finished product to achieve water-resistance performance.

### Are the components of PROTÉAN coatings derived from natural products?

Yes, PROTÉAN coatings are produced from renewable plant-based materials creating a sustainable alternative for manufacturing paper-based packaging products.

### Can coated paper bags be used for home composting?

Yes. Unlike PLA coated bags, our PROTÉAN coatings do not need special conditions for composting.

### What certifications does a PROTÉAN technology coated product come with?

The PROTÉAN based formulations are certified for a number of food contact applications. The final products made with PROTÉAN barrier products may also be compliant with these same certifications, but the manufacturers of products will need to certify that the additional materials used to produce them are also compliant. Currently PROTÉAN barrier additives have the following certifications:

- The PROTÉAN barrier additives are considered "Generally regarded as safe for food use" – FDA GRAS Notice No. 514. It is also compliant with FDA Food Contact Regulations 21 CFR 176.170 and 21CFR 176.180, which cover components of paper and paperboard in contact with aqueous, fatty and dry foods.
- The PROTÉAN materials are listed under BfR XXXVI and BfR XXXVI/2.