

## Improving the **Safety** and **Quality** of Food

with Pulsed Light by XENON



### A high dose of sunlight.

From the farm to the kitchen table, pathogens such as Listeria, Salmonella and E. coli can contaminate food products anywhere along the production process. For this reason, food processors incorporate "hurdle" concepts into their processes by combining multiple technologies to ensure that pathogens in food products are eliminated or controlled. As a chemical-free, non-thermal, and effective technology, Pulsed Light provides the ideal technology to complement any existing decontamination process and why food technology labs around the world are using Pulsed Light in food safety and quality research and development.

# What is Pulsed Light and How is it Superior to Other Disinfection Technologies?

Pulsed Light is a non-thermal, chemical-free and safe<sup>1</sup> technology that involves the application of full spectrum xenon light in short, powerful bursts at are 100,000 times the intensity of the sun as measured on surface of the earth. The high energy destroys pathogens by deactivating its DNA. In fact, Pulsed Light can kill up to 99.9% of pathogenic and spoilage microorganisms, bacteria, molds, and parasites<sup>2</sup>. And because the xenon light bursts are so short, there is no buildup of heat that could be harmful to the object being treated, as would be expected with mercury vapor lamps, for example.

Pulsed Light is ideal for applications that require continuous decontamination. Since pulses can be applied in fractions of a second, instead of the minutes that would be required for continuous UV, Pulsed Light is the ideal choice for food safety applications where food products are continuously moving through a production line (for example, food packaging sterilization, food conveyor decontamination and mushroom enhancement). Other advantages of Pulsed Light include being compact and easy to retrofit to an existing line and easily scalable to accommodate different process speeds.



How Energy, Low Heat

• No mercury to heat up

1. Pulsed Light has been determined to be safe for the production, processing and handling of food by the FDA and the Department of Health and Human Services (Code 21CFR179.41). 2. Fort Valley State University 2017 Research Study, https://nifa.usda.gov/announcement/improving-food-guality-one-light-time

#### **Making Foods Safer**



#### Decontaminating Food Conveyors

Conveyors are a troublesome source of contamination. Current decontamination methods, including washing, steam cleaning and chemical sanitization, require the line to be shut down frequently, and for extended periods to perform each cleaning cycle. Even with a daily cleaning regimen, the continuous nature of food conveyors means that contamination can start building again, immediately after cleaning. Pulsed Light provides food processors with the ability to continuously decontaminate food conveyor surfaces while potentially extending the time between wash-down cycles.



#### Sterilizing Food Packaging

Pulsed Light has proven to be an effective tool to improve food safety, not only for the food products directly, but also for food packaging. As a non-thermal technology, Pulsed Light does not damage low-temperature packaging or the food products that they contain. By treating food packaging with high-energy Pulsed Light, any microorganism which may have been acquired during forming and/or transport can be effectively eliminated.



#### Disinfecting Food Surfaces

Pulsed Light is uniquely suited for the treatment of food surfaces. Approved by the FDA for use on food and food packaging, Pulsed Light deactivates the DNA of pathogens that reside on the surface of many foods, and can accomplish this without negatively impacting taste or appearance. Research has proven that Pulsed Light is effective for a wide variety of foods, including fresh-cut vegetables, meat surfaces and clear liquid foods. Ongoing research continues to add to the list of foods that benefit from exposure to Pulsed Light.

#### Making Foods Last Longer

Many fruits and vegetables have been proven to have their shelf-life extended through exposure to Pulsed Light. Pathogens that can shorten the shelf-life of foods are neutralized, so many foods treated with Pulsed Light are not only safer, they stay fresh longer. As an example, blueberries can be treated to extend shelf life without the loss of bloom (the white powdery substance that appears on fresh blueberries and is a recognizable sign of freshness).





#### **Making Foods Better**

Pulsed Light is not only effective for disinfection and decontamination, it has also been proven to improve foods in a variety of ways. When mushrooms are treated with Pulsed Light, Vitamin D is boosted so that just a handful of mushrooms will provide 100% of the Recommended Daily Allowance, and research has shown that allergens in peanuts<sup>3</sup>, shrimp<sup>4</sup> and other food extracts can be reduced, or eliminated through treatment with Pulsed Light.

 Effects of Pulsed UV Light on Peanut Allergens in Extracts and Liquid Peanut Butter S.DY. Chung W. Yang K. Krishnamurthy, https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1750-3841.2008.00784.x

<sup>4.</sup> Pulsed Ultraviolet Light Reduces Immunoglobulin E Binding to Atlantic White Shrimp (Litopenaeus setiferus) Extract Sandra Shriver, Wade Yang, Si-Yin Chung and Susan Percival, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3155317/

### The Food Safety & Enhancement **Product Lineup**



Benchtop Pulsed Light System



Modular Sterilization System



Conveyor Decontamination System



Research & Development	•			
In-Line Production		•	•	
Food Packaging Sterilization		•		•
Food Conveyor Decontamination			•	
Pass-Through Disinfection				•
Food Enhancement		•		
Food-Grade Stainless Steel Meets IP67 and NEMA 4X Standards			•	•
Chemical Free	•	•	•	•

#### Let's develop a Pulsed Light solution for you.

Let XENON help you to explore and realize the full potential of Pulsed Light for your food safety and enhancement needs.



#### About XENON

With over 50 years of experience in Pulsed Light technology, XENON has established itself as the go-to Pulsed Light solution provider for the food industry. XENON works closely with clients to discover and perfect new applications of Pulsed Light. The company's lineup of high-performance systems provide 360 degrees of food safety, including the sterilization of food and beverage packaging; sanitization of air, space and floors; and the decontamination of food conveyors. In addition to its Pulsed Light systems, XENON designs and manufactures the lamps used in its systems which allows for optimum gas mixtures for specific applications.



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