

Milliken®

AlphaSan®

Silver Based Antimicrobial



Milliken™

What is AlphaSan?

AlphaSan is a zirconium phosphate-based ceramic ion-exchange resin containing silver.

High temperature stability and low color formation make AlphaSan uniquely suited to provide antimicrobial performance in a wide variety of applications such as plastics, fibers, foams, and coatings. Silver is widely used for human contact applications and is known to be effective against a broad spectrum of microorganisms that cause odor, discoloration, biofouling and other aesthetic problems. These antimicrobial properties can bring additional value through product differentiation to a variety of applications including food packaging, fibers and textiles, kitchen and bath surfaces, wall and floor coverings, medical devices, and appliances.

AlphaSan can be added to approved materials at varying levels to impart bacteriostatic, fungistatic, and algistatic properties to the material and the end-use article. For more information, contact your Milliken Technical Representative regarding applications using AlphaSan.

Features of AlphaSan

Excellent Efficacy | Excellent Durability

Thermal Stability | Processing Flexibility

Manufacturing Ease of Use | Safety



Typical Applications

- Appliances
- Automotive
- Bathroom Fixtures
- Bedding
- Building Materials
- Coatings
- Conveyor Belts
- Cutting Boards
- Filters
- Filtration
- Floor Covering
- Footwear
- Furniture
- Healthcare
- Ice Making Equipment
- Industrial Mats
- Outdoor Furniture
- Sealants
- Socks And Hosiery
- Sportswear
- Storage Containers
- Uniforms
- Water Coolers
- Whirlpool Tubs

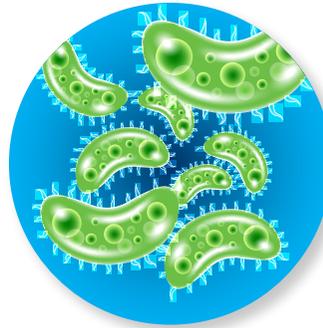


Why do you need an antimicrobial?

Microorganisms, also known as microbes, are living cells so small that most can be seen only with a microscope. Microbes include bacteria, fungi and algae, and are found everywhere on earth. While the majority of microbes do not interfere with most products, in some situations microbes can cause a variety of problems. Growth of microbes on materials such as textiles and plastics can lead to foul odors, discoloration and formation of biofilm (i.e. mildew, slime). In some cases, the attached microbes can even degrade or corrode the material.

Protecting products against microbes begins with proper hygiene and cleanliness. Cleaning and washing materials such as plastics and textiles with hot water and detergents is one of the best ways to remove and kill attached microbes. However, cleaning procedures can be costly and time consuming, and do not offer residual protection against fresh contamination. Use of a dependable, durable and safe antimicrobial is

the best way to provide residual protection against microbial contamination as a supplement to proper hygiene practices. By offering your products the added protection against microbial contamination provided by AlphaSan technology, additional value is created for your customers.



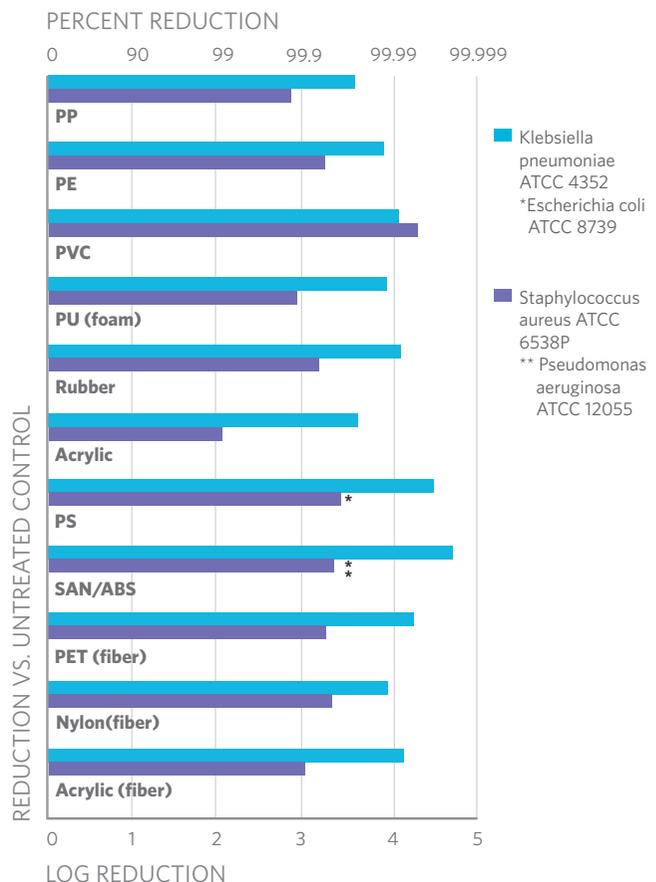
Untreated
Bacteria reproduce and reproduce



Treated with AlphaSan
Exposure to silver ions kills bacteria

Performance

The following efficacy data are presented solely to substantiate the antimicrobial activity of AlphaSan for non-public health applications. This data was collected using standard quantitative methods, and are representative of the antimicrobial performance in a variety of polymers containing 1.0% AlphaSan. The concentration of AlphaSan required for a specific application will depend on several variables, including environmental conditions, other additives in the material, and the level of desired performance.



AlphaSan currently is not registered in the United States of America for any public health applications. According to USEPA guidelines (PR Notice 2000-1), label claims for products sold in the United States are restricted to inhibitory activity against microbes for the protection of the treated article against aesthetic problems such as discoloration, odor or other types of product deterioration or spoilage. In addition, label claims cannot include the names of specific microbes or classes of microbes that are directly or indirectly infectious or pathogenic to man or animal. Please refer to the product label for a list of approved uses.

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About Milliken

Milliken is an innovation company that has been exploring, discovering, and creating ways to enhance people's lives since 1865. Working from our laboratories, application and development centers around the world, our scientists and engineers create coatings, specialty chemicals, and advanced additive and colorant technologies that transform the way we experience products from automotive plastics to children's art supplies. With expertise across a breadth of disciplines that also includes floor covering and performance materials, the people of Milliken work every day to add true value to people's lives, improve health and safety, and make this world more sustainable.

chemical.milliken.com

PLEASE NOTE: As each customer's use of our product may be different, information we provide, including without limitation, recommendations, test results, samples, care/labeling/processing instructions or marketing advice, is provided in good faith but without warranty and without accepting any responsibility/liability. Each customer must test and be responsible for its own specific use, further processing, labeling, marketing, etc. All sales are exclusively subject to our standard terms of sale posted at www.milliken.com/terms (all additional/different terms are rejected) unless explicitly agreed otherwise in a signed writing.

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The Milliken logo is a stylized, cursive script in blue, with a small trademark symbol (TM) at the end.