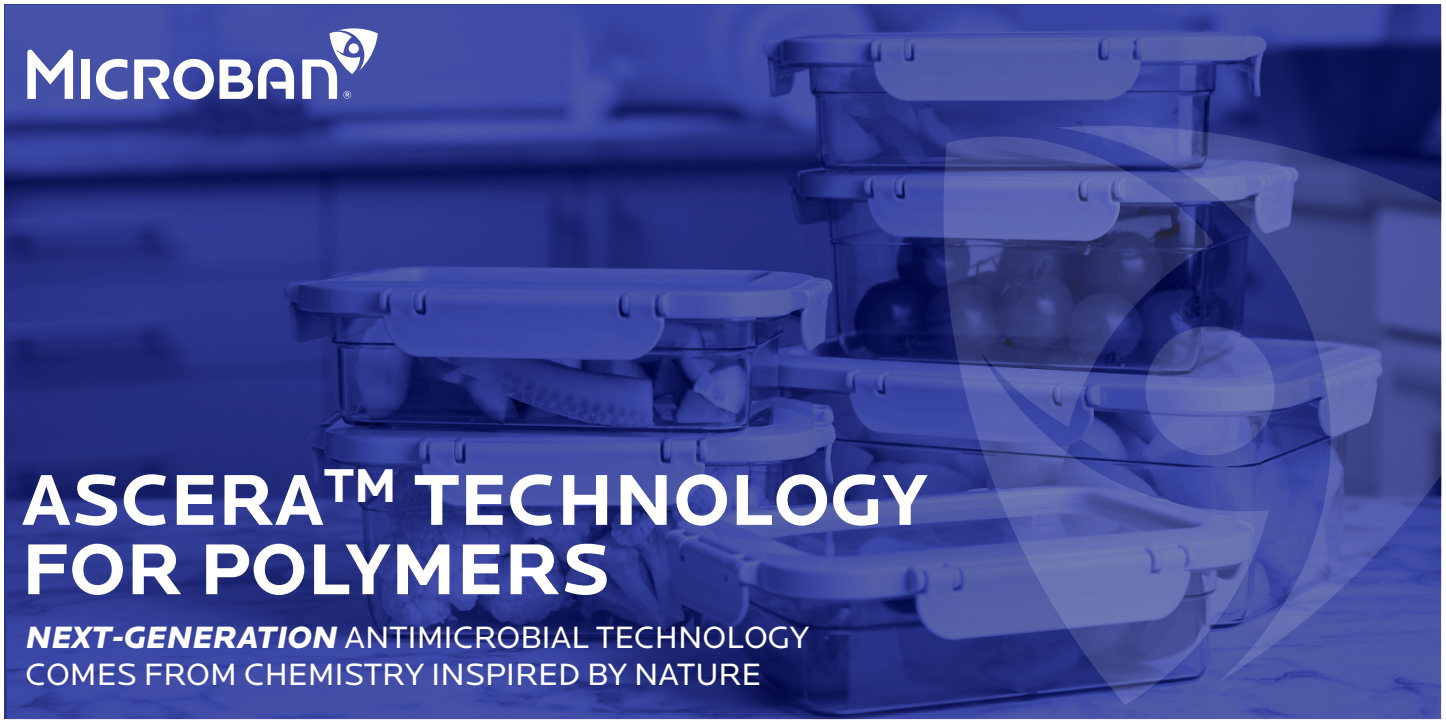


ASCERA™ TECHNOLOGY FOR POLYMERS

NEXT-GENERATION ANTIMICROBIAL TECHNOLOGY COMES FROM CHEMISTRY INSPIRED BY NATURE

Who is Microban International?

Founded in 1984 by two biomedical engineers, Microban International, Ltd. is the global leader in built-in antimicrobial solutions.

CONSUMER TRUSTMARK

Utilized by **300+ companies** worldwide

Proudly displayed on more than **1,000 products**

Globally acknowledged as a consumer Trustmark, the Microban® brand is utilized by 1,000+ companies worldwide and is proudly displayed on thousands of products in over 30 countries.

What is antimicrobial technology?

Antimicrobial technology is a solution that inhibits the growth of microorganisms such as bacteria, mold, and mildew.

Microban has a portfolio of over 25 approved organic and inorganic antimicrobial technologies that can be engineered into products and surfaces. These technologies work to deliver 24/7 product protection against microbial growth, without impacting product performance or aesthetics.

Our mission

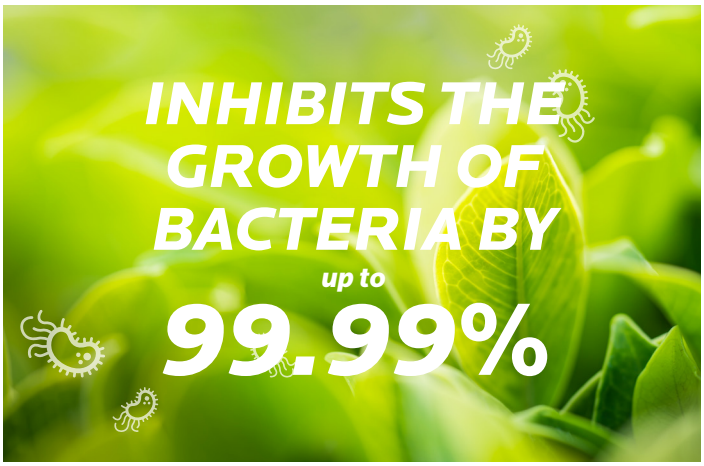
Microban recognizes that the long-term health of our business is directly connected to the health of the planet and local communities. At the core of our technological offerings, Microban is a sustainability-solutions focused company. Microban has been at the forefront of the industry in offering technologies that contribute to sustainability by extending the useful life of products to support efforts to decrease landfill loading, reduce energy and water usage. At Microban, we are also committed to the continued development of technologies that have a non-toxic profile and are environmentally friendly.

What is Ascera?

Ascera is a new, patent-pending antimicrobial product line from Microban. This represents our corporate innovation focus on developing environmentally friendly technology which eliminates metal-based chemistries from the formulation and reduces negative impacts on the planet. With active ingredient inspired by nature*, Ascera serves as a sustainable and effective antimicrobial solution. The technology also has exceptional chemical and UV stability. Microban has developed specific technical products that will enable Ascera to be easily incorporated into a range of molded polymers, textiles and coatings.

Industry-groundbreaking antimicrobial technology for polymers

As the global leader in antimicrobial industry, Microban has innovated a solution to utilize Ascera in polymer applications. Provided in pellet form and incorporated during the manufacturing process, Ascera is embedded into and dispersed throughout the polymer, making it a durable antimicrobial protection. The result has shown that Ascera is effective in inhibiting bacterial growth up to 99.99%. Polymer treated with Ascera won't suffer from bacteria that cause stains, odors and product degradation, further extending the useful life of the products.



PROTECTION THAT LIVES ON MICROBAN®

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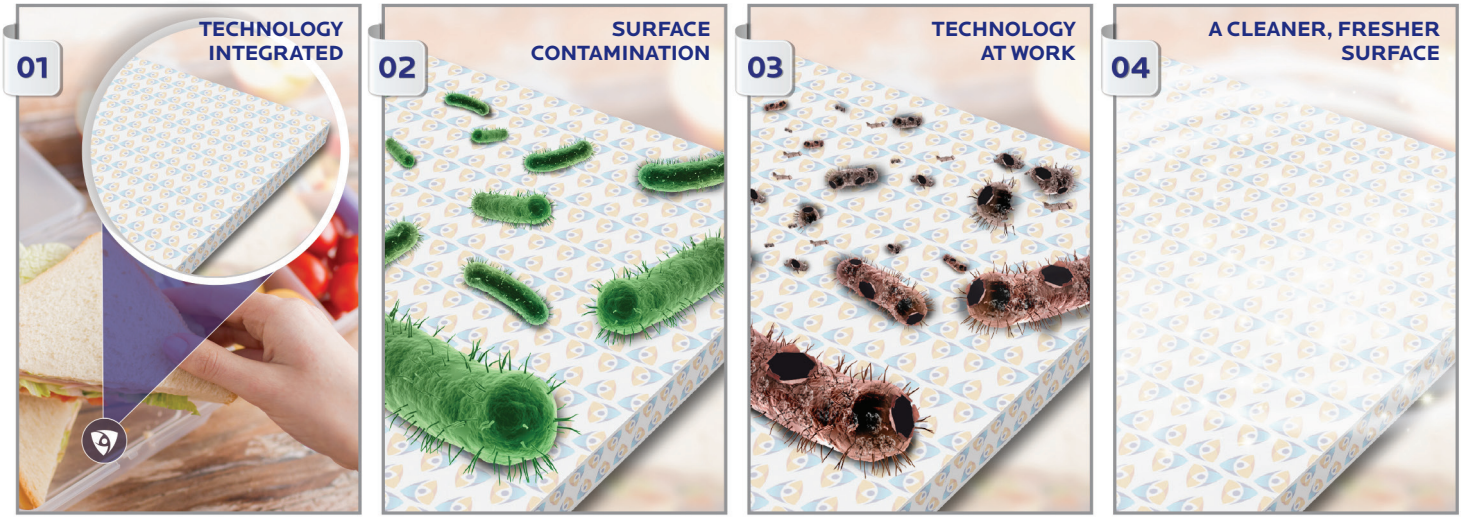
Global Headquarters | 11400 Vanstory Drive | Huntersville, NC 28078 | United States
T: +1 704-875-0806 **E:** info@microban.com **www.microban.com**



How does Ascera work?

Ascera interferes with the cell membrane permeability of microorganisms and hinders the cell's nutrition absorption and conversion processes, inhibiting their growth and survival. Once infused into a product, Ascera will remain active for its expected lifetime.

Technical data – *at a glance*

Antimicrobial efficacy	Antibacterial
Food contact	U.S: Pending EU: Approved
Test methods	ISO 22196: 2011 (AB)

Key applications

Microban antimicrobial technology can be integrated into most polymer materials, including PP, PE, TPE, TPR, PVC, TPU, EVA, and EPDM.

AUTOMOTIVE | ELECTRONICS | HEALTHCARE | FOOD SERVICE | CONSTRUCTION | PACKAGING

24-hour time lapse: untreated surface vs. Ascera treated surface

Using confocal imaging, Microban has captured the differences in bacterial growth on an unprotected surface versus a surface protected with Ascera. On an unprotected surface, the bacteria thrive and reproduce rapidly. On a surface protected with Ascera, the bacteria struggle to survive and their numbers are reduced considerably.

The benefits

- **Nature-inspired –** Industry groundbreaking technology with Microban ingredient inspired by nature*
- **Patent-pending –** Next generation antimicrobial technology from the industry leader
- **Metal-free solution –** Effective alternative to metal-based antimicrobial additives
- **Easy to use –** Easily integrated into existing manufacturing processes with no disruption
- **UV stable –** Ideal solution for use in outdoor applications
- **Multiple applications –** Can be incorporated into a wide range of polymer materials for use in a variety of applications
- **24/7 protection –** Effective against microbial growth 24/7 and for the expected life of coating products
- **Regulatory Registrations –** The technology is registered with EU Biocidal Products Regulation (BPR). U.S. Environmental Protection Agency (EPA) registration is pending

Get in touch - For more information on our turnkey solutions for polymers, contact a member of the Microban team today.

*The Microban technology used in this product is similar to acids found in nature and is used in multiple consumer product applications.

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ASCERA™ TECHNOLOGY FOR COATINGS

NEXT-GENERATION ANTIMICROBIAL TECHNOLOGY COMES FROM CHEMISTRY INSPIRED BY NATURE

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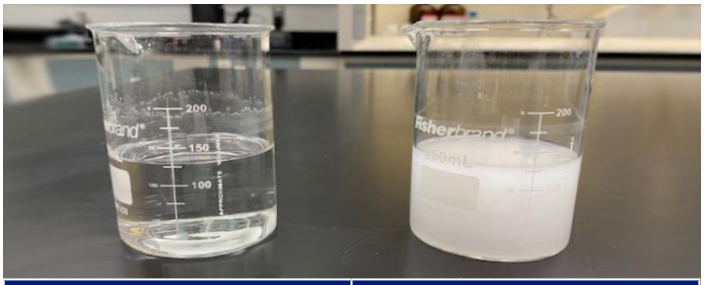
What is Ascera?

Ascera is a new, patent-pending antimicrobial product line from Microban. This represents our corporate innovation focus on developing environmentally-friendly technologies which eliminate metal-based chemistries from the formulations and reduce negative impacts on the planet. With an active ingredient inspired by nature*, Ascera serves as a sustainable and effective antimicrobial solution. The technology also has exceptional chemical and UV stability. Microban has developed specific technical products that will enable Ascera to be easily incorporated into a range of molded polymers, textiles and coatings.

The innovative solvent-based coatings technology

As the global leader in antimicrobial industry, Microban has innovated a solution to utilize Ascera in solvent-based coatings. This technology is designed to seamlessly integrate antimicrobial functionality into solvent-based coating formulations. It provides clear advantages over traditional metal-based antimicrobial systems consisting of insoluble powders that are heavy and difficult to keep suspended. Ascera is a step forward in providing robust turnkey antimicrobial solutions to solvent-based coatings manufacturers.



ASCERA	TRADITIONAL ANTIMICROBIALS
Clear and UV stable	May cause yellowing or other negative visual defects
Easy to incorporate, mix, and disperse	Difficult to incorporate, mix and disperse
Stability after incorporation	May phase separate or settle due to gravity

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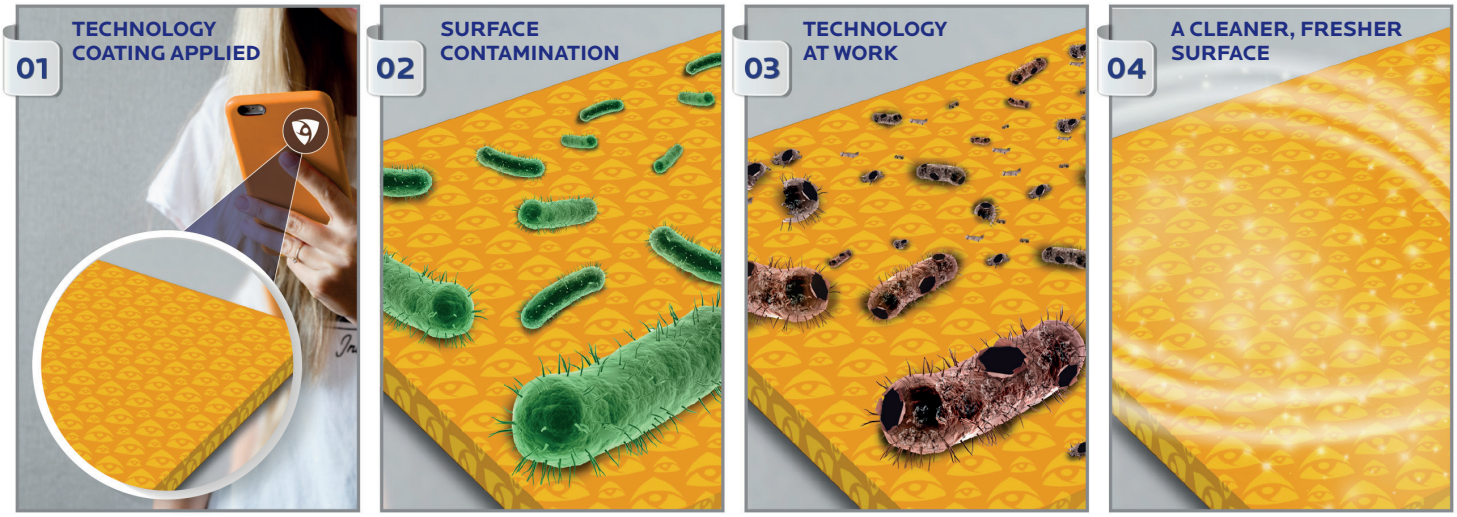

How does Ascera work?

Ascera utilizes an active inspired by nature to help inhibit bacterial growth by up to 99.99%. Standard coating processes (i.e. spraying, roll-to-roll, dip, etc.) can be used to apply coatings using the technology. Ascera interferes with the cell membrane permeability of microorganisms and hinders the cell's nutrition absorption and conversion processes, inhibiting their growth and survival.

Technical data – *at a glance*	
Antimicrobial efficacy	Antibacterial
Food contact	U.S: Pending EU: Approved
Appearance	White flake powder
Test methods	ISO 22196: 2011 (AB)

Examples of Ascera coating applications - solvent-based coatings and paints for application on:

Polymers | Wood | Metal | Glass ...and more

24-hour time lapse: untreated surface vs. Ascera treated surface

Using confocal imaging, Microban has captured the differences in bacterial growth on an unprotected surface versus a surface protected with Ascera. On an untreated surface, the bacteria thrive and reproduce rapidly. On a surface enhanced with Ascera, the bacteria struggle to survive and their numbers are reduced considerably.

The benefits

- **Nature-inspired –** Industry groundbreaking technology with Microban ingredient inspired by nature*
- **Patent-pending –** Next generation antimicrobial technology from the industry leader
- **Heavy-metal-free solution –** Effective alternative to metal-based antimicrobial additives
- **Easy to use –** Optimized processing and manufacturing requirements allow for easy incorporation to a variety of solvent-based coatings systems
- **UV stable –** Ideal solution for use in outdoor solvent-based coating applications
- **Improved quality –** Improved stability with minimal impact on optical properties of solvent-based coatings
- **24/7 protection –** Effective against microbial growth 24/7 and for the expected life of coating products
- **Regulatory registrations –** Registered with EU Biocidal Products Regulation (BPR). U.S. Environmental Protection Agency (EPA) registration is pending

Get in touch - For more information on our turnkey solutions for coatings, contact a member of the Microban team today.

*The Microban technology used in this product is similar to acids found in nature and is used in multiple consumer product applications.

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