MICROBAN®

The Next Generation Silver Technology

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A Microban International Ltd White Paper

Sectional Contents

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The world is filled with microorganisms including disease-causing and object-damaging bacteria. Practically everything humans or animals touch – kitchen counters, bathroom fixtures, door knobs, floors or medical equipment – is sure to have bacteria like *Escherchia coli* and *Staphylococcus aureus*, which can cause severe illness if surfaces aren't cleaned and disinfected regularly.

Take hospital beds, for example. Established criteria say that to be safe for humans, microbial flora on high-touch surfaces must not exceed 100 colony-forming units (CFU)/100cm2 potential pathogens and 250 CFU/100cm2 total microbial colony counts. Military sponsored research found that harsh disinfectants must be used every two hours to keep ICU bed rails below those levels of disease-causing bacteria, including Methicillin-resistant Staphylococcus aureus (MRSA), Vancomycin-resistant Enterococcus (VRE), two antibiotic-resistant strains of bacteria.[1] The researchers' primary conclusion: Hospital-approved disinfectants can quickly reduce bacteria counts to safe levels, but the bacteria rebound quickly to rise above 250 CFU/100cm2, and each bed rail must be re-disinfected every 120 minutes to maintain continuous, safe protection.

Similarly, the touchpoints of medical scales used in various healthcare environments are constantly in contact with patients, employees and environmental contaminants over the course of a day. Unfortunately, these types of surfaces may often be forgotten or go unnoticed during daily cleaning protocols.

In reality, no one has the time or personnel to clean every surface in a hospital, healthcare facility, shopping center, home, bathroom – or anywhere else – every two hours. Plus, disinfectants can contain harsh chemicals, including bleach and peroxide, which may cause respiratory irritation, be harmful if swallowed, injure bare skin, and damage or discolor the objects they're trying to treat.

http://www.cdc.gov/media/releases/2014/p0326-hospital-patients.html

Solution: Microban® SilverShield

Silver has long been used as an antimicrobial agent, at least since Hippocrates first described silver's antimicrobial properties in 400 B.C., but it wasn't until 1972 that scientists understood how silver works. Small amounts of silver disrupt bacteria's metabolism by preventing it from converting nutrients into energy, which inhibits bacteria survival, reproduction and colonization.[2,3]

Microban's innovative SilverShield takes silver's proven antimicrobial effectiveness in polymers a huge step forward. Because of its unique geometry and highly efficient release mechanism, SilverShield reacts up to 8 times faster than other silver antimicrobials while maintaining polymer durability and integrity.

…business buyers looking to standardize antimicrobial protection across a broad base of products can access medical equipment featuring built-in Microban technology…

Testing shows that SilverShield provides 99% reduction of Salmonella enterica, E. coli, MRSA and VRE at room temperature. Typically, objects can claim antimicrobial effectiveness with tests run at body temperature (37°C) over a 24-hour period, whereas SilverShield has been shown to reduce bacterial loads below safe levels at room temperature (25°C). These more rigorous criteria more closely approximate real-world use, where objects are far more likely to be at room temperature than body temperature.

SilverShield is not designed to replace a disinfectant, but rather complement the disinfectant in the fight against bacteria. Silver is constantly presented on the surface and ready to be released 24/7. This means that polymers with SilverShield offer continuous protection against bacteria, thereby helping to extend the effectiveness of disinfectant chemicals well beyond the 120 minutes before bacteria regain their foothold with disinfectants alone.

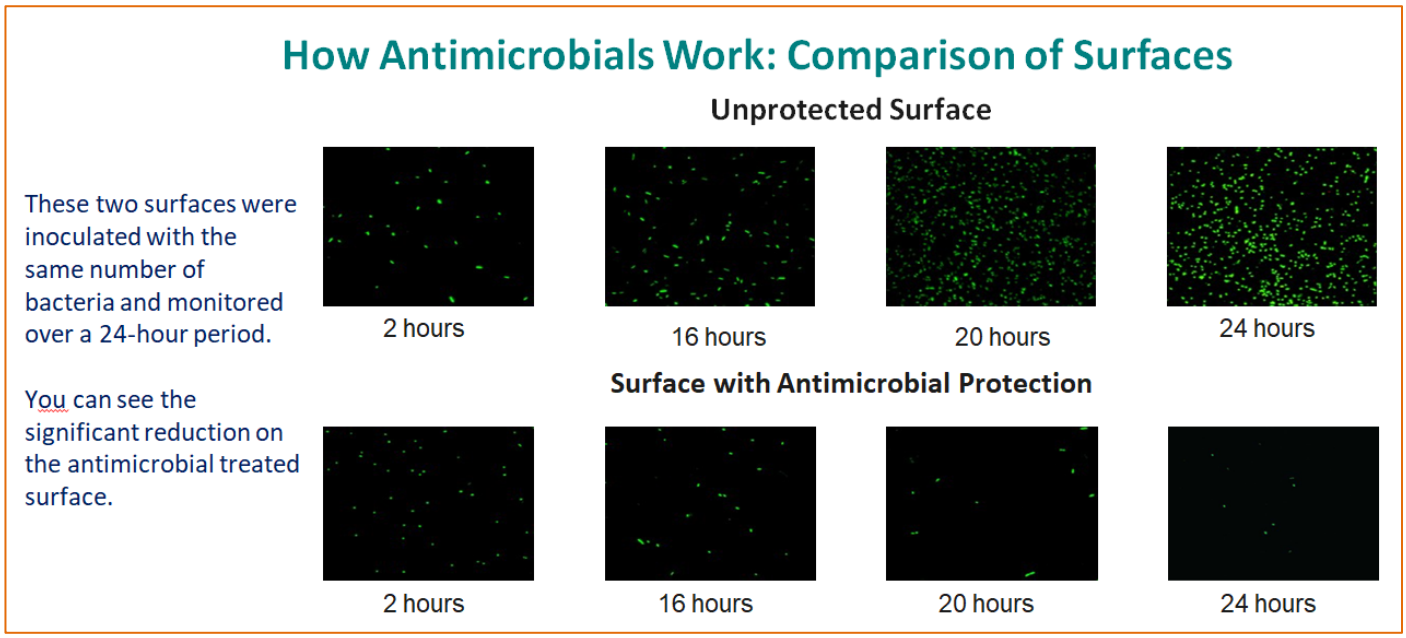
In, for example, healthcare environments, business buyers looking to standardize antimicrobial protection across a broad base of products can access medical equipment featuring built-in Microban technology, such as storage and transport equipment, medical scales, building materials, surgical products and medicine-dispensing units, from a wide variety of leading manufacturers. This standardization contributes to their systematic approach to creating a cleaner healthcare environment.

Microban SilverShield both complements and helps to extend the effectiveness of standard chemical disinfecting routines used in medical settings, homes and public spaces. Also, because it's embedded throughout polymers during the manufacturing process, SilverShield remains effective even if an object is nicked or scratched.

A Safe Alternative

SilverShield is inert until it comes into contact with a damp environment in which bacteria can proliferate. Only then will it release minute amounts of silver – just enough to inhibit the bacteria's metabolism and prevent reproduction. Its accuracy makes it a weapon in the ongoing battle against harmful microbes.

It is registered with the U.S. Environmental Protection Agency (EPA) as safe to use in a variety of applications including those that come in contact with food. Its small, uniquely shaped particles are designed to release silver ions faster than other silver-based products. Even though the particles are small, they are still too large to be considered a nanotechnology, which may alleviate the concerns of some consumers.



SilverShield's intelligence, unique geometry and EPA registration mean it's government approved as safe to use in objects that people or food can touch or can come in contact with. These qualities offer significant market advantages for SilverShield containing polymers.

SilverShield's Market Advantage for Polymers

Microban SilverShield's antimicrobial properties make products more appealing to cleanliness- conscious consumers and business buyers in a wide variety of industries, including health care (e.g., hospital equipment) and construction/hardware (e.g., flooring, faucets, bathroom fixtures, countertops, etc.). Consumers perceive the Microban brand as a valuable trustmark that says they're getting durable and effective antimicrobial protection that doesn't negatively affect products' safety, integrity, functionality, aesthetics or durability.

How SilverShield Is Implemented

Microban works individually with polymer manufacturers to make SilverShield integration as simple and seamless as possible without disruption to existing manufacturing processes.

Engineers develop customized formulations of SilverShield for each individual product, such as an embedded solution in a powder coating process for product surface protection. These custom formulations are tested with manufacturers' own polymers both for antimicrobial effectiveness and to ensure that SilverShield will not degrade or decrease the aesthetics or function of any part of the product. By providing SilverShield to manufacturers in masterbatches and training manufacturing staff on its proper use, Microban makes it very easy to properly insert SilverShield in polymers. Microban also implements a regular and ongoing testing protocol with partners to ensure that the

SilverShield technology continues to work over time, and is consistently being implemented for maximum efficacy.

[1]Attaway, Hubert H. et al. Intrinsic bacterial burden associated with intensive care unit hospital beds: Effects of disinfection on population recovery and mitigation of potential infection risk. American Journal of Infection Control, 2013; 40(10), 907-912.

[2]Jung, W. K., Koo, H. C., Kim, K. W., Shin, S., Kim, S. H., & Park, Y. H. (2008). Antibacterial activity and mechanism of action of the silver ion in Staphylococcus aureus and Escherichia coli. Applied and environmental microbiology, 2008; 74(7), 2171- 2178.

[3]Morones-Ramirez, J., Winkler, J. A., Spina, C. S. & Collins, J.J. Silver Enhances Antibiotic Activity Against Gram-Negative Bacteria. Science Translational Medicine, 2013; 5(190), 190ra81. http://dx.doi.org/10.1126/scitranslmed.3006276

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Company Profiles

In October, 2017, SR Instruments, Inc., and Microban International, LTD, announced a business partnership whereby SR Instruments' flagship product line, SR Scales, will now come standard with Microban SilverShield® embedded antimicrobial technology.

SR Scales infused with Microban technology feature added protection against the growth of bacteria and the technology will be included in all SR medical stand-on, wheelchair, and wall mount scales.

About Microban International, LTD

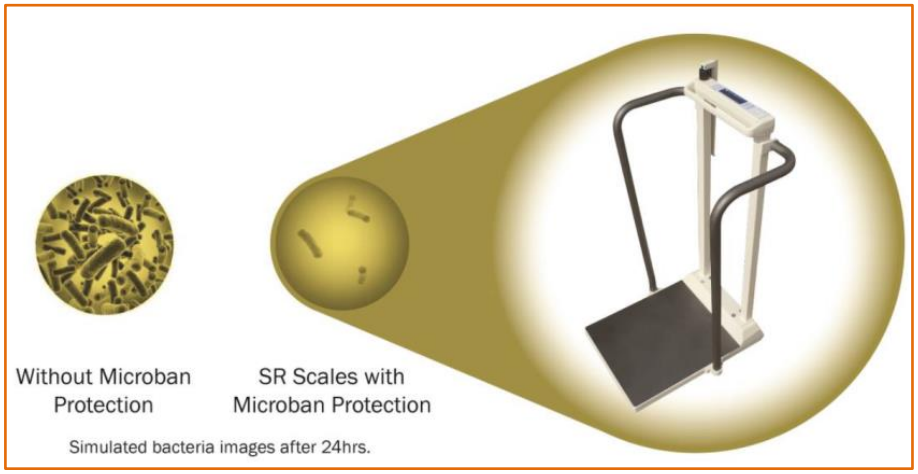
Microban International is the global leader for built-in antimicrobial product protection. With more than 30 years of experience, the Microban team has extensive knowledge across a variety of key industries, including healthcare, food service and building. From durability requirements to marketing support and patent counsel, Microban supplies partners with thorough and advanced services to help them seamlessly deploy new antimicrobial technologies to meet growing consumer demands for products that remain cleaner and fresher for longer.

About SR Instruments, Inc.

SR Instruments, Inc., is a leading manufacturer of purpose-built scales for hospitals, medical facilities, and long-term care centers, as well as OEM and ODM solutions. The company's innovative design capabilities provide leading-edge solutions for efficiently gathering and managing weight data for end users to make better decisions. The company manages the complete process of customizing scales; from initial design concepts and prototyping to manufacturing. Headquartered in the greater Buffalo, NY region, SR Instruments designs and manufactures SR Scales in the USA.

Frequently Asked Questions about SR Scales Infused with Microban® Antimicrobial Protection

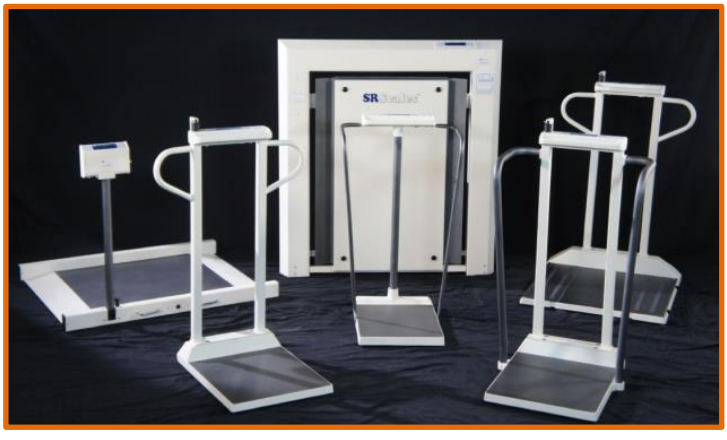
Why did SR Instruments decide to make scales with anti-microbial protection?
Scales are typically deployed throughout a hospital to weigh many patients on a daily basis. These scales are often moved and shared throughout the facility, potentially spreading bacteria to multiple patients. We felt that adding antimicrobial protection to our scales was a proactive approach to help reduce the growth of bacteria on the scales as part of a medical center's approach to creating a cleaner healthcare environment.



Why did SR Instruments Choose Microban® antimicrobial technology for SR Scales?
Microban International, Ltd is a global leader in antimicrobial technologies. The company's products have undergone extensive independent laboratory testing and have a long history of safe, effective use. Microban technology is registered with the EPA and regulatory agencies around the world. The Microban name is a recognized and trusted brand, which can be found in leading consumer and industrial products.*

Which Microban product does SR Scales use?
SR Scales are infused with Microban SilverShield® technology, an embedded antimicrobial on critical scale surfaces. Because of its unique geometry and highly efficient release mechanism, SilverShield reacts up to eight times faster than other silver antimicrobials.*

Which SR Scale models are infused with Microban?
SR Instruments will be incorporating the Microban antimicrobial protection across its entire medical products line-up of stand-on, wheelchair, and wall mount scales.



Which surfaces are treated with Microban technology?
All painted and critical touch surfaces are infused with Microban antimicrobial protection. These include the platform, handrails, display housing, keypad, and visible labeling.

How does having a full line of antimicrobial scales help a medical facility?
As part of a medical facility's ongoing infection control program, Microban protected scales promote a cleaner healthcare environment by inhibiting the growth of bacteria on the scales.

Does Microban antimicrobial technology eliminate the need for standard hospital cleaning procedures?
SR Scales infused with Microban are meant to complement existing cleaning protocols.

Is SR Instruments charging more for Microban protection?
There is no price increase for Microban protection. This is now a standard feature for SR's stand-on, wheelchair, and wall mount scales, made in the USA.

Does Microban protection begin working immediately?
Microban protection begins to work as soon as the micro-organism comes into contact with the product surface. It then works continuously to maintain a consistently lower bio-burden than would be expected on a product without Microban protection. Under the right conditions, microbes on an untreated surface can double every 20 minutes.*

How long will the Microban antimicrobial protection work?
Microban protection is built-in during the manufacturing process and will not wash off or wear away. Microban protection is engineered to provide continuous antimicrobial product protection for the useful lifetime of the product.*

How can I tell the difference between an SR Scale with and without Microban?
SR Scales that incorporate Microban technology will have the "SR Scales infused with Microban" emblem label on the scales.

Where can I learn more about Microban technology?
The following link provides more information and additional resources for understanding Microban, antimicrobials in healthcare, and SilverShield technology:

https://www.microban.com/sr-scales

*Information supplied by and approved by Microban International, Ltd.