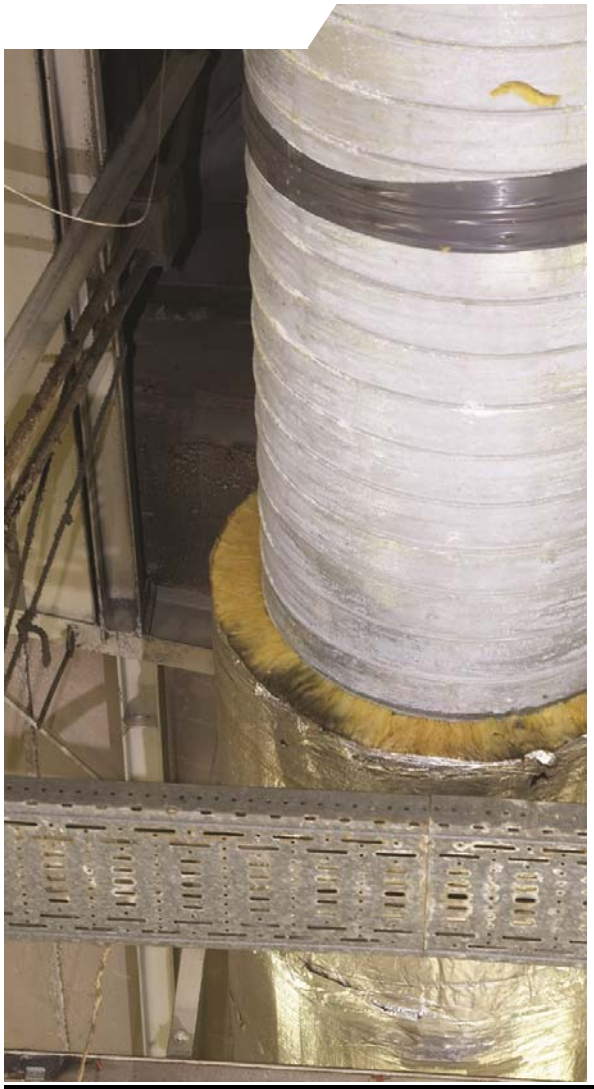
ANTI-MICROBIAL PROTECTION

ARMACELL – MAKING A DIFFERENCE AROUND THE WORLD.

armacell

CONTROL OF MICROBE GROWTH ESSENTIAL FOR OCCUPANT HEALTH

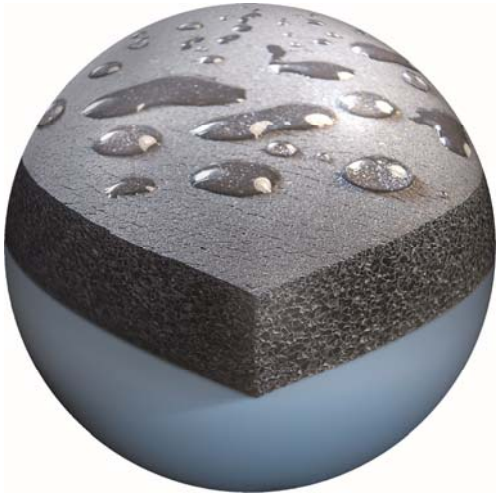


- Microbes: Wide group of different organisms which can cause illness and disease in humans
- Mold spores in the air stream can aggravate respiratory problems.

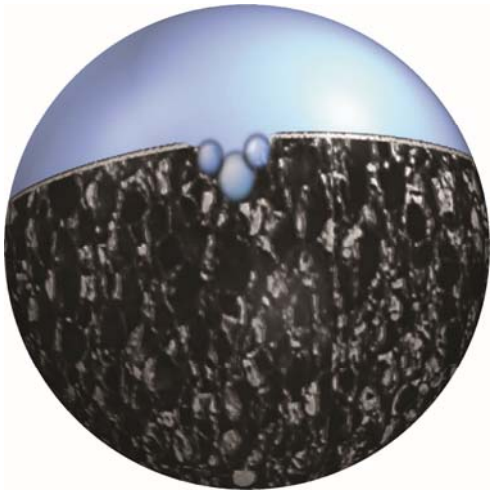
- **With ample food and moisture, mold and bacteria can multiply quickly → dramatic rise in risk of human infection, especially in buildings which may restrict free circulation of contaminated, stale air.**

- Combination of **passive and active approaches can reduce the overall risk** and increase both the air quality and health of a building
- Major objective in sensitive school and hospital environments

2-TIER PROTECTION: PASSIVE CONTROL PREVENTION OF MOISTURE INGRESS

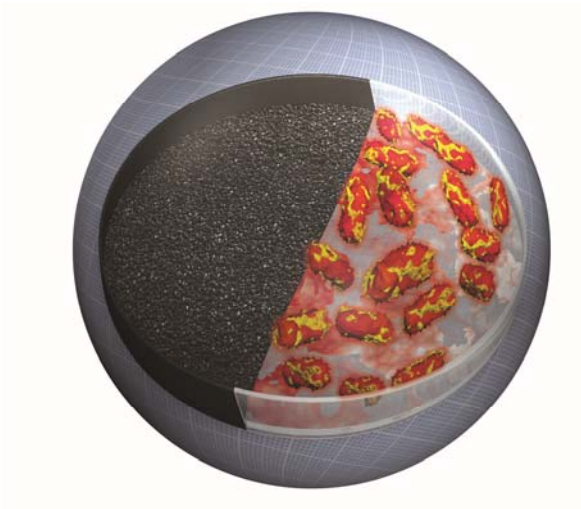


- Closed-cell structure
- Built-in water vapor barrier



- Non-wicking
- Small puncture results in localized damage and not system-wide failure

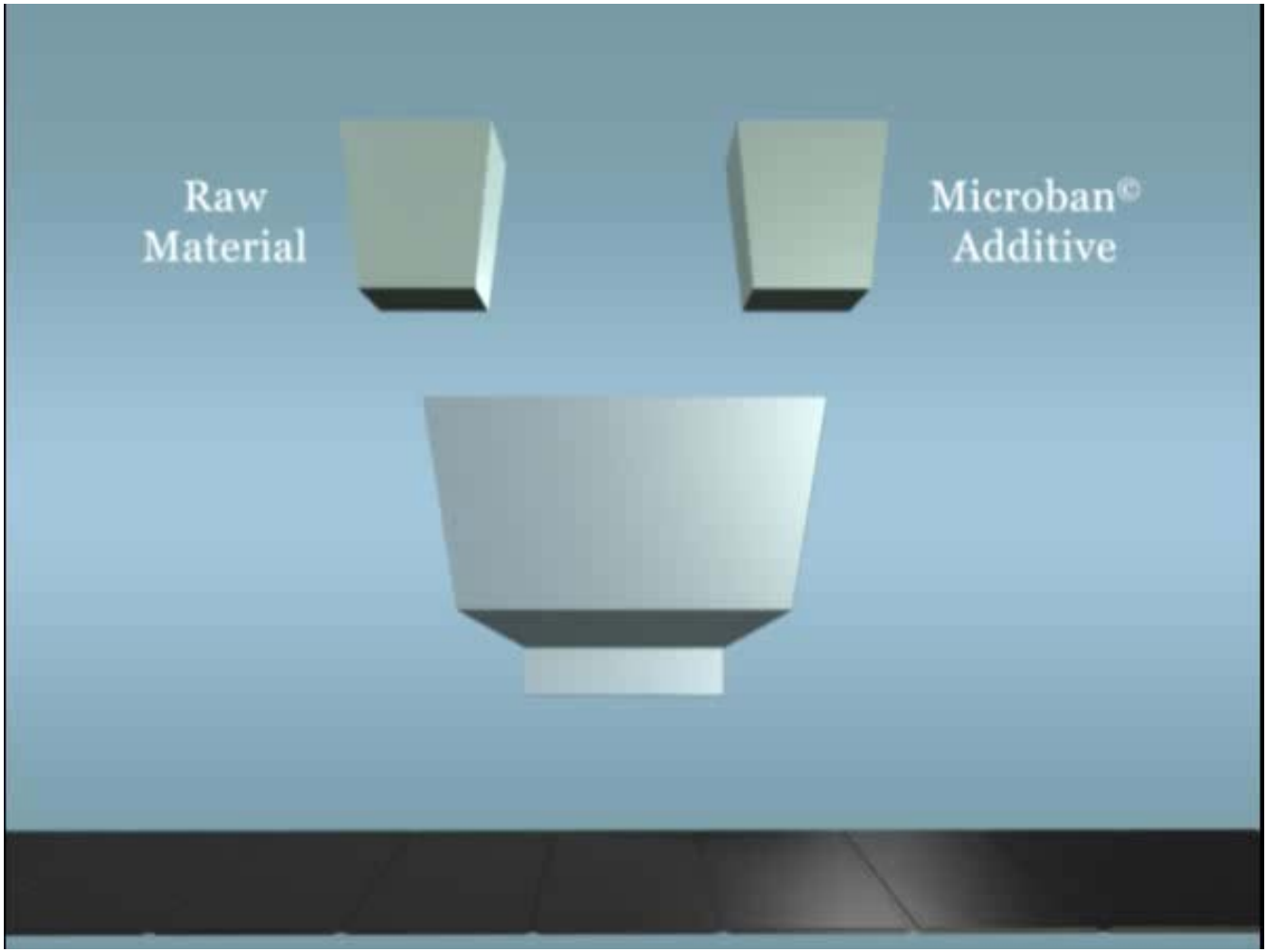
2-TIER PROTECTION: ACTIVE CONTROL MICROBAN® ANTIMICROBIAL TECHNOLOGY



- Microban® is an antimicrobial additive which actively inhibits certain types of mold and bacteria
- Provides effective resistance, even if the surface is damaged or pierced

- Additive added during the manufacturing process of Armaflex® → cannot be used up or washed off
- Offers active antimicrobial protection throughout the service life of the insulation material

BUILT-IN MICROBAN® PROTECTION WILL NOT BE DEPLETED OR WASHED AWAY



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INHIBITS GROWTH OF MOLD AND FUNGI

- Sample treated with Microban® antimicrobial additive
- Zone of inhibition around the sample
- Mold and fungi are unable to grow in proximity to or on the surface of sample treated with Microban®

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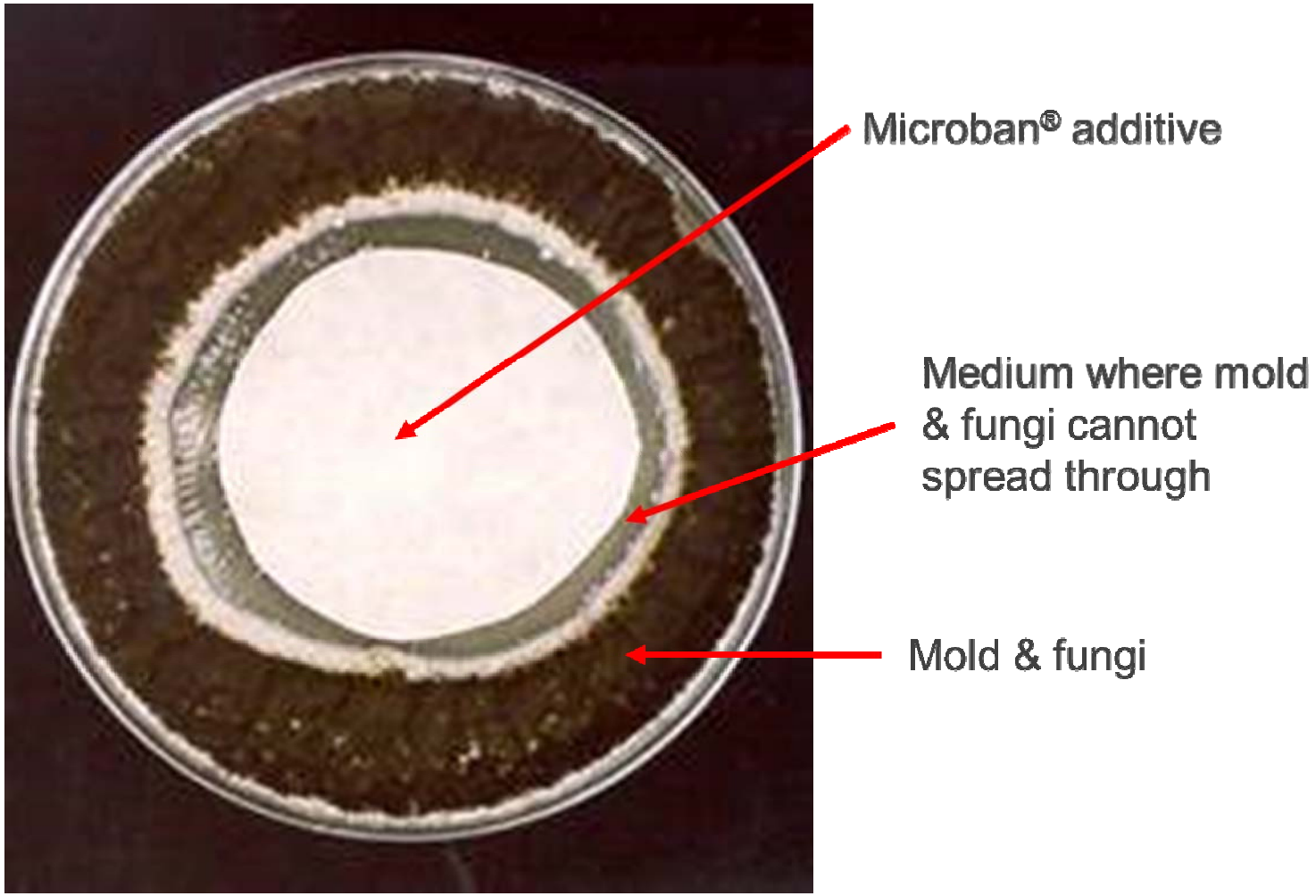
MICROBAN® FORMS BARRIER INHIBITING GROWTH



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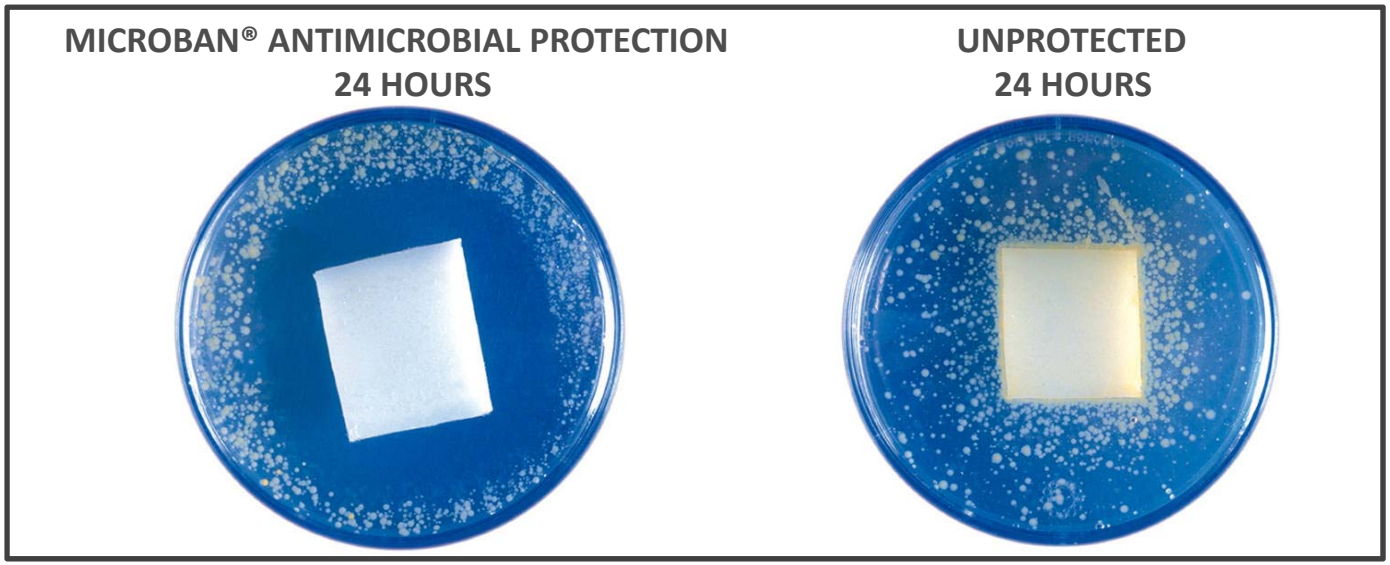
MICROBAN® EFFICACY AGAINST BACTERIA

- Industry standard test method: Both samples were inoculated with bacteria and then photographed after 24 hours.

  Left: Manufactured with Microban® antimicrobial production protection

  Right: Untreated sample

- **Result:** The **sample with built-in Microban® protection showed a zone of inhibition**, i.e. no growth on or around the sample, while the untreated sample on left showed significant contamination.



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MICROBAN® EFFICACY AGAINST FUNGUS

- Industry standard test method: Both samples were inoculated with fungus and then photographed after 14 days.

  Left: Manufactured with Microban® antimicrobial production protection

  Right: Untreated sample

- **Result**: **Fungal growth on wood coupons coated with Microban® treated paints were not observed**, while significant mold colonization was detected on samples coated with unpreserved paint.

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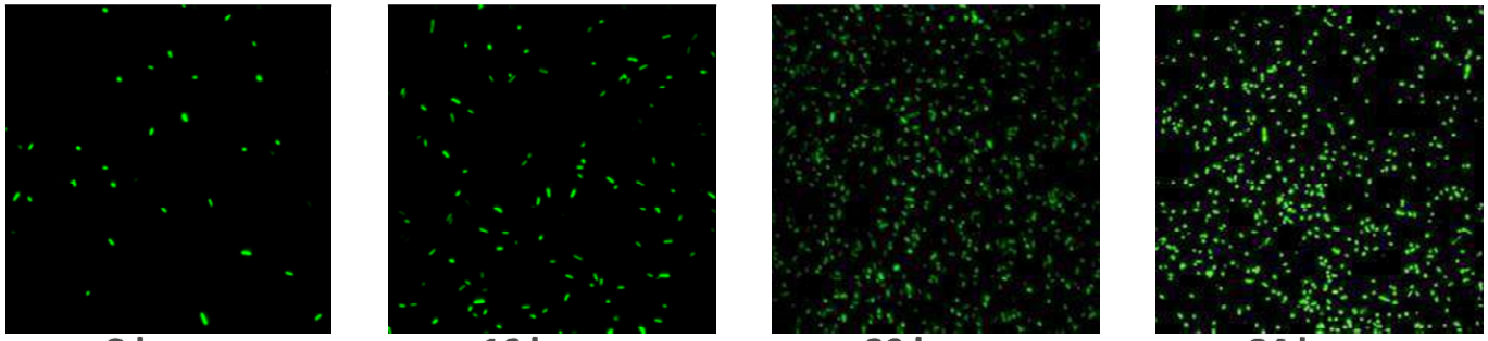
EFFICACY OF MICROBAN® ANTIMICROBIAL PROTECTION

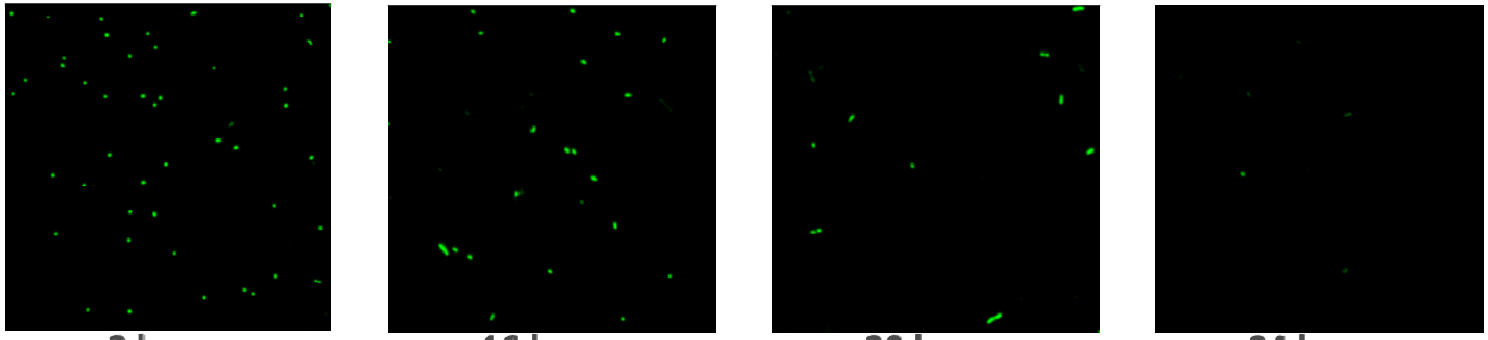
Microban® antibacterial protection

Unprotected Surface



2 hours | 16 hours | 20 hours | 24 hours

Surface with Microban® Antimicrobial Protection



2 hours | 16 hours | 20 hours | 24 hours

MICROBAN® is a registered trademark of Microban Products Company. This information is based upon standard laboratory tests and is provided for comparative purposes to substantiate antibacterial activity for non-public health applications. Microban® antimicrobial technology is not designed to replace good hygiene practices or protect users from disease causing microorganisms. Antibacterial action limited to product surface.

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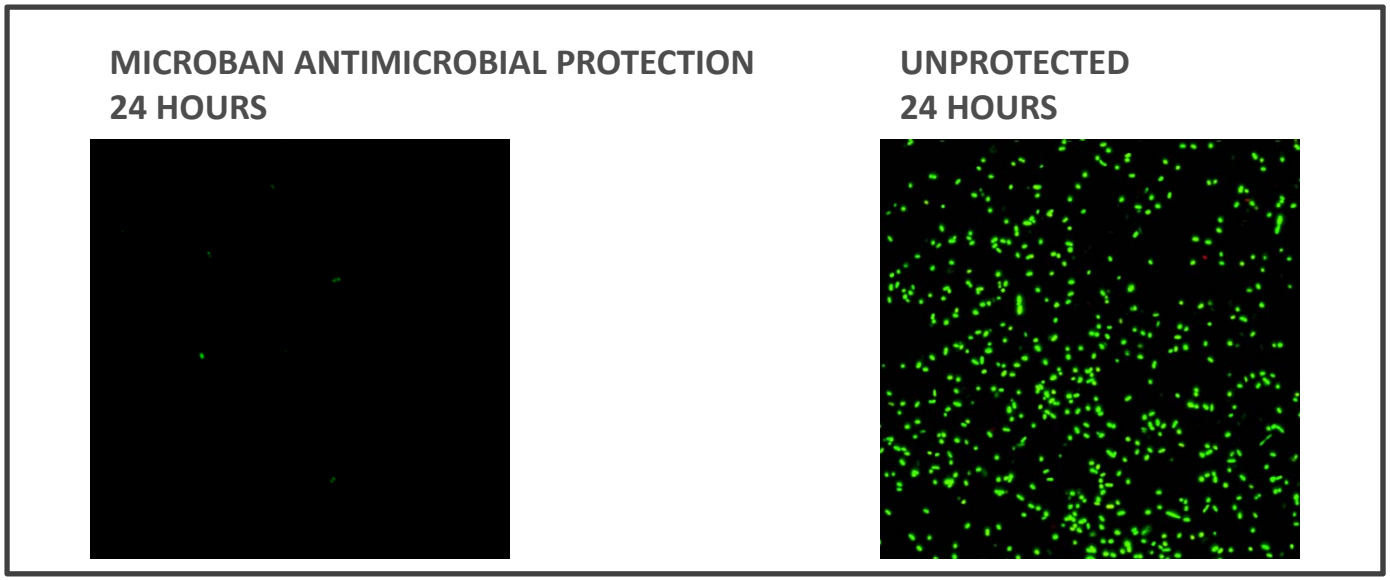
MICROBAN® EFFICACY DEMONSTRATION – CONFOCAL IMAGES

On an unprotected surface, <u>bacteria can double in number every 20 mins</u>. The confocal images to the left demonstrate how Microban® antimicrobial technology begins to work immediately, disrupting key bacterial cell functions so the microorganisms are unable to function, grow or reproduce on the surface. While on the unprotected surface (right), bacteria quickly multiplies over 24-hours.



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