MICRO 360 SHIELD™

Overview

STAR BIO SOLUTIONS LLC

What is MicroShield 360?

- An EPA registered and FDA approved coating system that imparts durable biostatic activity to a wide variety of substrates. The system drastically reduces potential for cross-contamination while also preventing mold and odors from ever forming.

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What MS360 Brings to the Market

- Residual coating that provides protection between cleanings
- Technology creates a safety net against human error in cleaning and disinfecting
- Currently holds EPA and FDA regulatory approvals for 1000+ facility types, 1500+ surfaces

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MS360 Goes Beyond Traditional Disinfection

- UV lighting
- Chlorine bleach
- Formaldehyde & aldehydes
- Quaternary ammoniums
- Chlorhexidene
- Sodium hydroxide
- Phenols

NO RESIDUAL PROTECTION

MS360 Antimicrobial

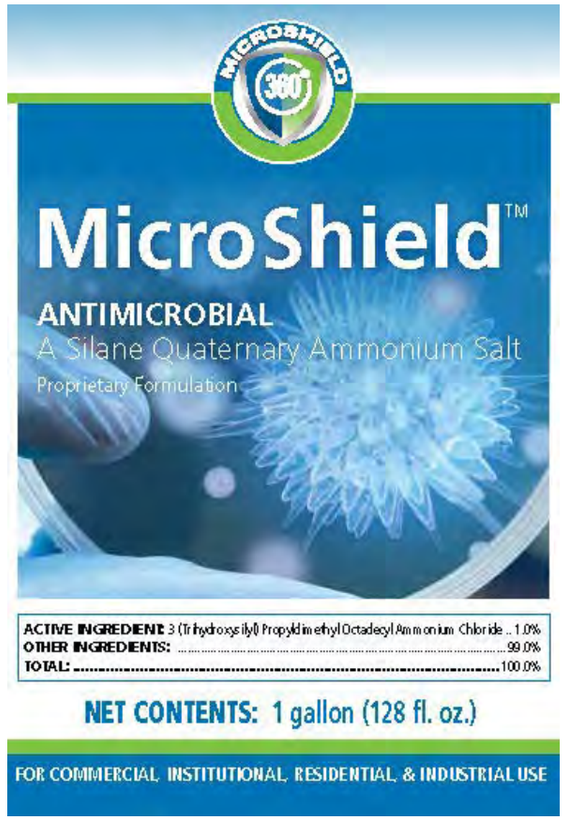
Constant Residual Protection Between Cleanings

MicroShield 360 Renew (disinfectant)

- Eliminates 99.99% of microbial contamination
- Daily use cleaner, sanitizer and disinfectant

MicroShield 360 Antimicrobial

- Physically bonds to surface for lasting protection
- Works WHILE people are in facility



Application

- Electrostatic gun ionizes the solution and applies a charge to the mist
  - Particles are 900x smaller than normal sprayer droplets
  - Charge is 75x the force of gravity
- MicroShield 360 Renew (surface prep)
- MicroShield 360 Coating (finish)
- Room is ready immediately following drying of surfaces ~5min

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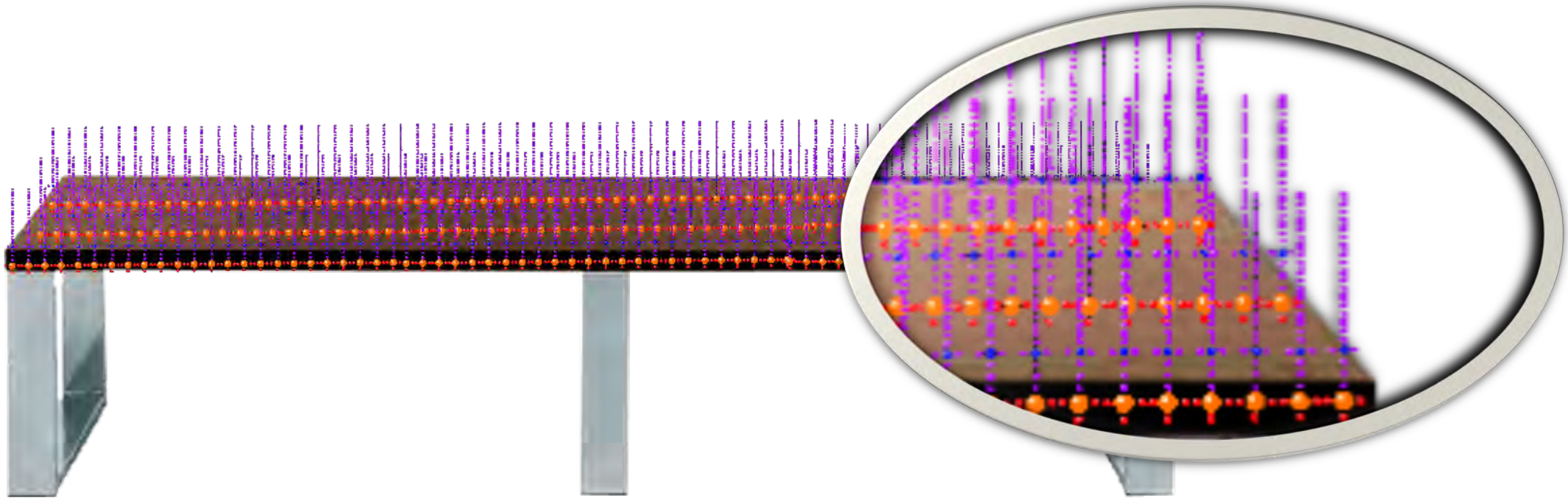
Post Application – **Permanent** Bond

Forms a covalent bond that cross-links and polymerizes to itself and the target surface. This creates a uniform and cohesive web across the substrate.



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MicroShield 360 In Action

01

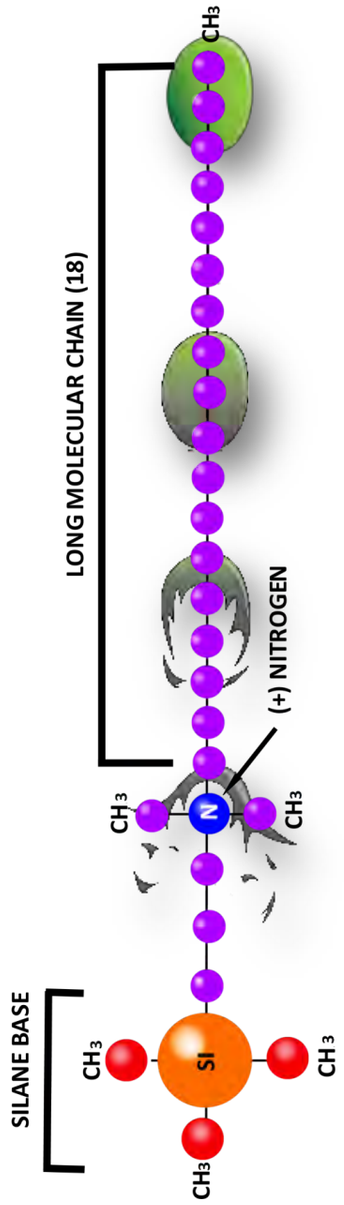
Nitrogen atom's positive charge attracts the cell toward the coating

02

Long carbon chain pierces the pathogen and disrupts its physical structure

03

Once the pathogen contacts the nitrogen atom it applies a charge which neutralizes it



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MicroShield 360 Research

- **EFFICACY:** The MicroShield 360 technology has exhibited 99.9999% reduction in surface contamination relative to a control after 120 individual passings.
- **DURABILITY:** Research shows MicroShield 360 on a surface after 60 power washings and 60 scrubbings with 3M (Scotch Brite) scouring pad over 9 months.
- **KILL RANGE:** Shows the technology performs extremely well on a diverse group of surfaces while preventing bacteria, odors, and mold from living on them.

* These are not label claims, rather information on durability.

Ohio State University

- Performed on Listeria
- Testing began 3 months post application
- Washed with detergent and 3M scrub pad then immersed in water and allowed to dry before inoculating
- Showing a log 6 reduction (99.9999%) after 20 washings or 120 passings on the same square inch

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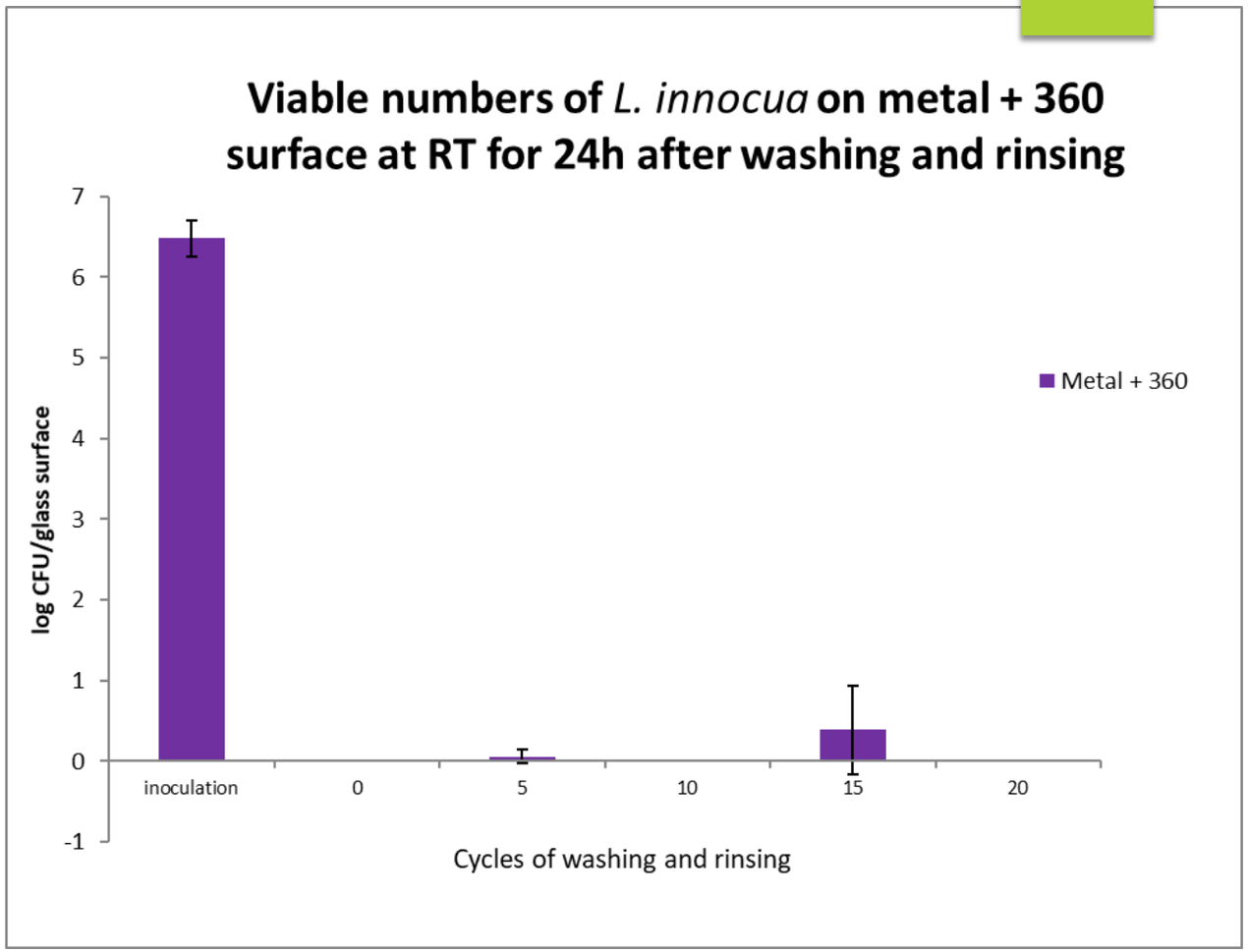

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Testing Completed by Independent Labs in 2019

Date Testing Conducted	Pathogen	Carrier	Method	Strength	Temperature	Time	Results
6/10/2019	Campylobacter jejuni	50x50mm acrylic	Japanese Industrial Standard Z 2801	full	36 +/- 1C	10 minutes	70.24%
6/10/2019	Campylobacter jejuni	50x50mm acrylic	Japanese Industrial Standard Z 2801	full	36 +/- 1C	1 hour	99.74%
5/16/2019	Salmonella enterica	50x50mm acrylic	Japanese Industrial Standard Z 2801	full	36 +/- 1C	Time zero	98.49%
5/16/2019	Salmonella enterica	50x50mm acrylic	Japanese Industrial Standard Z 2801	full	36 +/- 1C	10 minutes	99.67%
5/16/2019	Salmonella enterica	50x50mm acrylic	Japanese Industrial Standard Z 2801	full	36 +/- 1C	1 hour	>99.98%
5/16/2019	Salmonella enterica	50x50mm acrylic	Japanese Industrial Standard Z 2801	full	36 +/- 1C	24 hours	99.998%
5/16/2019	E. coli	50x50mm acrylic	Japanese Industrial Standard Z 2801	full	36 +/- 1C	Time zero	99.64%
5/16/2019	E. coli	50x50mm acrylic	Japanese Industrial Standard Z 2801	full	36 +/- 1C	10 minutes	>99.96%
5/16/2019	E. coli	50x50mm acrylic	Japanese Industrial Standard Z 2801	full	36 +/- 1C	1 hour	99.97%
6/24/2019	Staphylococcus aureus	4.8 cm diameter swatches of leather	AATCC 100	full	36 +/- 1C	24 hours	99.84%
6/24/2019	Klebsiella pneumoniae	4.8 cm diameter swatches of leather	AATCC 100	full	36 +/- 1C	24 hours	97.50%
5/16/2019	Candida albicans	50x50mm acrylic	Japanese Industrial Standard Z 2801	full	30 +/- 1C	Time zero	78.57%
5/16/2019	Candida albicans	50x50mm acrylic	Japanese Industrial Standard Z 2801	full	30 +/- 1C	1 hour	>98.41%
5/16/2019	Candida albicans	50x50mm acrylic	Japanese Industrial Standard Z 2801	full	30 +/- 1C	24 hours	>99.98%

Shows how fast MicroShield 360 begins to work

* These are not label claims, rather information on how quickly MS360 begins to work

MICROSHIELD 360

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	Silver-Based	MicroShield 360	Triclosan-Based	Bleach
COST	Expensive	Economical	Moderate	Economical
DURABILITY	Embedded in/on fiber or as a coating. Loses potency (leaching)	Permanent and non-leaching	Embedded in/on fiber or as a coating. Loses potency (leaching)	Works only while wet with no residual protection
MODE OF ACTION	Releases ionic free radicals that react with cell DNA and disrupt the cells life processes	Physically ruptures the cells membrane and provides a shock neutralizing the cell	Releases PCB (Bischlorinate Phenol) for consumption or absorption to kill cell	Hypochlorous acid, the active ingredient in bleach, causes the unfolding of proteins in bacteria
RESISTANCE FORMED	Yes. As concentration weakens (leaching) it no longer efficiently kills lending to formation of resistances	No. As the coating is non-leaching it never sacrifices its self to kill and therefore always maintains lethal power	Yes. As concentration weakens (leaching) it no longer efficiently kills lending to formation of resistances	Yes. As concentration weakens (leaching) it no longer efficiently kills lending to formation of resistances
SAFETY	Harmful if inhaled, absorbed through skin and moderate eye irritant	Mild eye irritant	Main active ingredient banned in various countries.	Highly toxic where as a few drops to a teaspoon can provide a lethal oral dose

Implications for Market

OVERALL REDUCTION IN BIO-LOAD ACROSS A FACILITY

LOWER TRANSMISSION OF CELLS FROM SURFACES TO PATRONS AND STAFF

SAFETY NET AGAINST HUMAN ERROR IN CLEANING

BRAND ENHANCEMENT & REDUCTION IN LIABILITY

OVERALL BETTER ENVIRONMENT

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Additional Info

FOR MORE INFORMATION PLEASE VISIT:
STARBIOSOLUTIONS.COM

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OR CALL 956-284-6147

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