

Microsilver BG Information

Antibacterial activity of silver-killed bacteria: the "zombies" effect

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5386105/>

Bio-Gate MicroSilver BG Proves Effective vs. COVID-19 and Other Viruses

<https://www.cosmeticsandtoiletries.com/formulating/function/antimicrobial/Bio-Gate-MicroSilver-BG-Proves-Effective-vs-Corona-and-Other-Viruses-570039571.html>

MicroSilver BG™: A novel, pure silver antimicrobial with highly porous and micro-sized particles

https://www.researchgate.net/publication/287574941_MicroSilver_BG_A_novel_pure_silver_antimicrobial_with_highly_porous_and_micro-sized_particles

MicroSilver BG™
(close-up of one particle)

- Pure silver powder additive
- Surface area: up to 5m²/g
- Average particle size: 10µm

Highly porous particle:

- Surface area: up to 5m²/g
- Silver Porosity: 90-95%
- Average particle size: 10 µm
- No nano particles
- INCI Name: Silver
- CAS No.: 7440-22-4

Manufactured according to:

- ISO 13485 (medical devices)
- ISO 9001

Approvals / Certifications:

- Biocidal Product Directive (EU)
- REACH pre-registered
- FDA Masterfile
- EPA (USA)
- ECOCERT
- COSMOS
- NPA
- Patented

Nano free
according to DIN ISO 15320-1

MicroSilver BG™

ECO CERT
COSMOS CERTIFIED

* This terminology is only accepted in Europe.

Antiviral* Efficacy of Microsilver Test Results

Product	Cytotoxicity log ₁₀ CD50/ml	Titer Virus Control (log ₁₀ TCID50/ml)	Titer Virus Control (log ₁₀ TCID50/ml)			Reduction / Efficacy		
			30 sec.	2 min.	30 min.	30 sec.	2 min.	30 min.
Hand Gel A	2.50	6.75	<3.13	<3.13	-	>3.63 (>99.98%)	>3.63 (>99.98%)	-
Hand Gel B	2.50	6.75	-	<2.25	<2.25	-	>4.25 (>99.99%)	>4.25 (>99.99%)
Surface Spray	3.50	6.75	-	5.50	<3.50	-	1.25 (>94.4%)	>3.25 (>99.94%)

- Surface Spray: >94% in 2 minutes and >99.9% within 30 minutes



Opulence Global's screen

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OPULENCE

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MicroSilver BG™ Antiviral* Efficacy Test Setup

Test Samples

1. Hand Gel with 0.1% MicroSilver BG + 63% Alcohol
2. Hand Gel with 0.1% MicroSilver BG + 38% Alcohol
3. Surface Spray with 0.1% MicroSilver BG (no other active)
4. Shampoo with 0.1% MicroSilver BG

- Tests performed in Germany at certified anti viral testing laboratory against enveloped virus
- Testing against MVA which is a so called surrogate virus for SARS Cov 2
- SARS Cov 2 and MVA are both enveloped viruses
- Tested against MVA (modified Vaccinia Virus Ankara)
- 80% of the liquid to be tested
- 0.3 g/l BSA (Protein error)



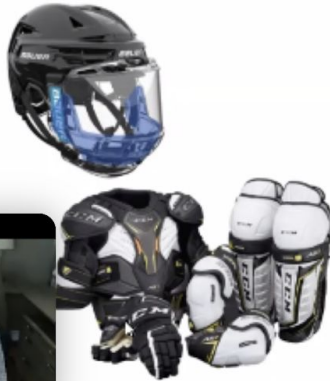
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MicroSilver BG™ Spray Application

Spray onto fabrics to improve the long-term hygiene of textiles, protection products and face masks



01

Eliminating microbes WITHOUT alcohol

Water-based formula with pure MicroSilver BG™: No alcohol or harsh disinfectant chemicals used to be antiviral and antimicrobial

02

Eliminating odour

Odor-binding technology that binds unpleasant odors immediately.

03

Long-lasting protection

Lab tests showed an antimicrobial* effect on the textiles 7 and 14 days after spraying.

04

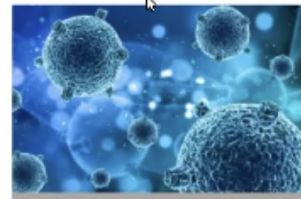
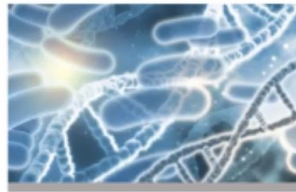
Usage

Suitable for surfaces and textiles, such as breathing masks, face masks, scarves, work clothes. Can be sprayed on inside and outside of masks before and after use.

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Opulence Global's screen

...epled in Europe.



MicroSilver BG™ Spray Test Results

Long-lasting antiviral*, antimicrobial*, anti-odor efficacy

Inhibits >99,9% of bacterial germs even 7 days after application

ISO 20743: Textile was sprayed and tested 2 weeks later against Staphylococcus epidermidis with >99.9% reduction efficacy

Result after 2 weeks



Tested against enveloped viruses (MVA):

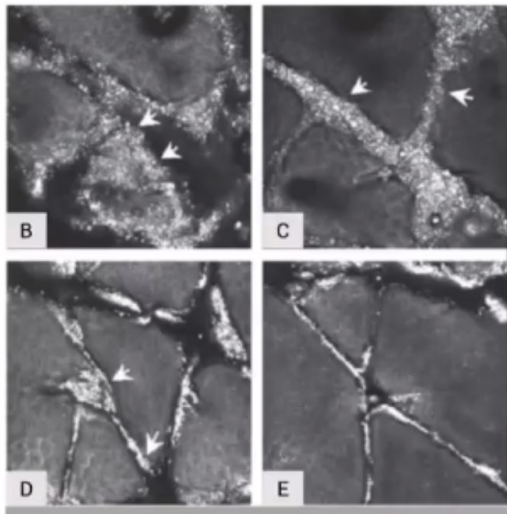
- >94.4% reduction in 2 min
- >99.9% reduction in 30 min
- EN 14476: Spray was tested against enveloped MVA viruses

Result after 2 weeks



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MicroSilver BG™ Maintained on for hours

Long lasting antimicrobial activity on
surface of skin / textile



B & C
Directly after application

D & E
2 hours after application

REC

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MicroSilver BG™ Spray Field Study

- A modern concept for more sustainable hygiene between disinfection cycles
- Field Study with 2 buses from Nuremberg, Germany

- ✓ Continued and lasting reduction of germs by up to 90% over 8-day field trial on numerous surfaces (49 and 54 test points)
- ✓ Awarded contract to supply spray to clean Nuremberg's public transit vehicles
- ✓ In Europe, the product can be marketed as antiviral and help fight COVID-19

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Field Study Results

Results – Interesting Observations – Textiles
The peak values for 2 seats in the bus [RLU]:

	30-JUL-2020		3-AUG-2020	7-AUG-2020
	Before spray	After spray		
Seat 1 Left Row Window	41,309	601	2,049	2,750
Seat 5 Left Row Aisle	23,876	308	2,222	108

- Contamination is huge! *How is this possible?*
 - Backpacks, luggage, shopping bags that had previously been placed elsewhere. Pets? Very dirty clothes.
 - Textile Seats are only deep / steam cleaned with soap solution one time per year
- Efficacy of Spray:
 - Quickly reduction of germs using the MicroSilver spray
 - Sustainable activity over time
- Note: The seats show the highest level of germ contamination in both buses of all surfaces

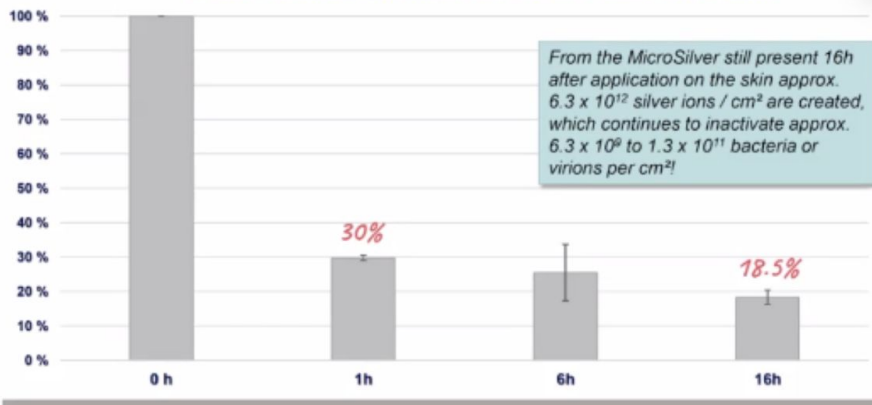
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Analysis (ICP-OES) of Reclaimed Silver Remaining on Skin Over Time

Test product: 0.1% Microsilver Hand Sanitizer

% MicroSilver maintained on the skin over time



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