SEAL-N-KILL

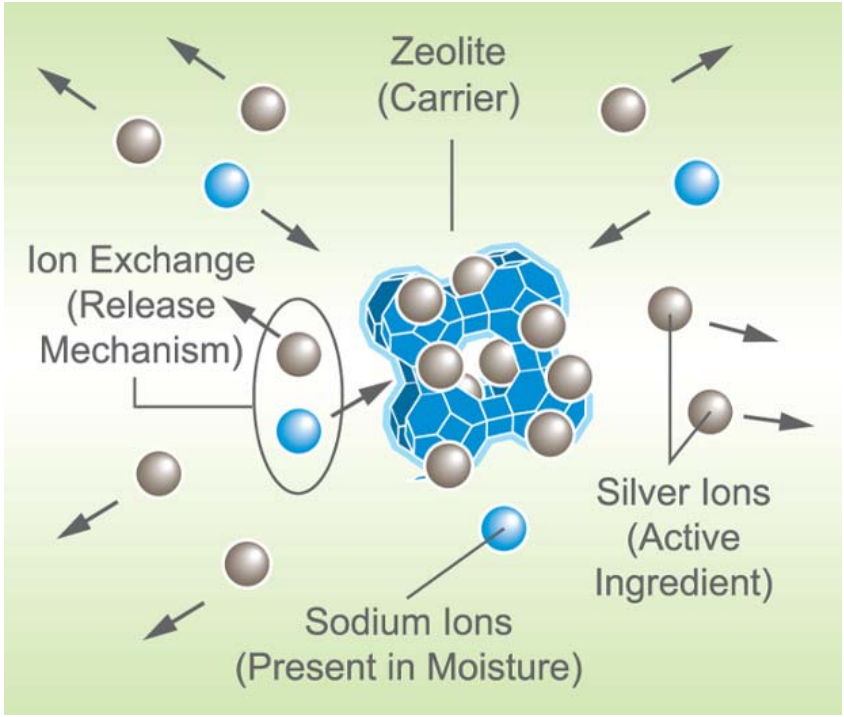
Interchangeable, Antimicrobial,
Protective Barriers

SEAL-N-KILL

- Transparent, Easy to apply- cut, peel and stick
- Patented Agion Antimicrobial Technology
- Unique patent pending design and features
- Protects frequently touched surfaces
- Retains residual activity for a year
- Antimicrobial agents are National Science Foundation (NSF) and U.S. Federal Drug Administration (FDA) listed and U.S. Environmental Protection Agency (EPA) registered. Listed with the Cosmetic, Toiletry, and Fragrance Association as a cosmetic preservative.

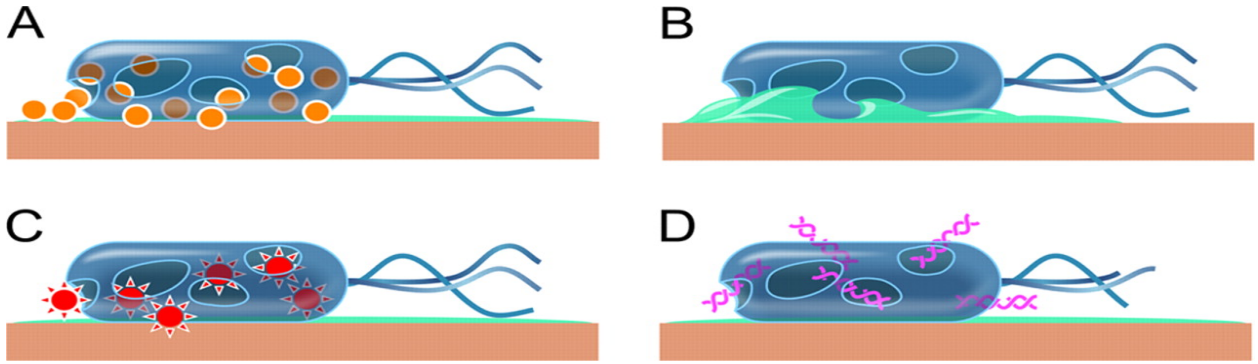
How Does It Work?

- SEAL-N-KILL is impregnated with silver and copper in a patented zeolite carrier that allows a controlled release of metallic ions under microbial growth conditions. The antibacterial, antifungal and antiviral properties of metal ions have been extensively studied.



How do silver and copper ions kill microbes?

- Multiple killing mechanisms; including rupturing cell membrane - cells lose nutrients and water, preventing respiration, inhibiting membrane transport, cell division and reproduction and disrupting cell metabolism. Multifaceted attack prevents resistance formation.



3-Hospitals Study - Frequently Touched Surfaces

Med. Univ. of South Carolina, Charleston, SC, Memorial Sloan Kettering Cancer Ctr., New York, NY, Ralph H Johnson VA, Charleston, SC

Results:

- 1760 objects in 160 rooms were sampled The average MB (Microbial Burden) of the room was 16,885 cfu/100cm2. (colony-forming unit (cfu) is an estimate of the number of viable bacteria or fungal cells in a sample
- Bed rails had the highest comprising an Average of 65% of the MB
- Objects in close proximity to the patient had significantly higher average MBs compared to other objects in the room; bed rails, call button, and chair
- Staphylococcus was the predominant organism isolated from each object and each room comprising 66% of the average MB

Conclusions:

- Objects found in rooms can serve as a reservoir for the spread of bacteria, particularly staphylococci, to patients, healthcare workers, and visitors.
- Objects in close proximity to patients pose the greatest risk, particularly bed rails
- Future studies should focus on strategies to reduce high level bacterial contamination of common objects in patient rooms and potential spread of these bacteria in order to potentially reduce healthcare-acquired infections.

Persistence of clinically relevant bacteria on dry inanimate surfaces *BMC Infectious Diseases* 2006

Acinetobacter spp.	**3 days to 5 months**
Bordetella pertussis	3 – 5 days
Campylobacter jejuni	up to 6 days
Clostridium difficile (spores)	5 months
Chlamydia pneumoniae, C. trachomatis	≤ 30 hours
Chlamydia psittaci	15 days
Corynebacterium diphtheriae	7 days – 6 months
Corynebacterium pseudotuberculosis	1–8 days
Escherichia coli	1.5 hours – 16 months
Enterococcus spp. including VRE and VSE	5 days – 4 months
Haemophilus influenzae	12 days
Helicobacter pylori	≤ 90 minutes
Klebsiella spp.	2 hours to > 30 months
Listeria spp.	1 day – months
Mycobacterium bovis	> 2 months
Mycobacterium tuberculosis	1 day – 4 months
Neisseria gonorrhoeae	1 – 3 days
Proteus vulgaris	1 – 2 days
Pseudomonas aeruginosa	6 hours – 16 months; on dry floor: 5 weeks
Salmonella typhi	6 hours – 4 weeks
Salmonella typhimurium	10 days – 4.2 years
Salmonella spp.	1 day
Serratia marcescens	3 days – 2 months; on dry floor: 5 weeks
Shigella spp.	2 days – 5 months
Staphylococcus aureus, including MRSA	7 days – 7 months
Streptococcus pneumoniae	1 – 20 days
Streptococcus pyogenes	3 days – 6.5 months
Vibrio cholerae	1 – 7 days

SEAL-N-KILL Test Results

Microorganism: *s. aureus*

24 HOUR TEST	Zero Time	24 Hrs	% Reduction
Control	200,000 cfu/ml	1,600,0000 cfu	None (100X increase)
SEAL-N-KILL	200,000 cfu/ml	less than 10*	99.9999%

1 HOUR TEST	Zero Time	1 Hr	% Reduction
Control	240,000 cfu/ml	260,000 cfu	None
SEAL-N-KILL	240,000 cfu/ml	Less than 10*	99.997%

10* Limits of detection

Note: Microbe Burden (MB) in SEAL-N-KILL Test was 29X average MB found on hospital surfaces.

Copper Clad Surfaces Reduce HAI's

- Three medical center study -July 12, 2010 to June 14, 2011. items such as bed rails, tables, IV poles, and nurse's call buttons were made solely from copper-based metals.
- The proportion of patients who developed Healthcare Acquired Infection (HAI) and/or colonization with MRSA or VRE was significantly lower among patients in rooms with copper surfaces (7.1%) compared with patients in traditional rooms (12.3%). The proportion of patients developing HAI was significantly lower among those assigned to copper rooms (3.4%) compared with those in traditional rooms (8.1%).

Application Features

- Available in 2 in x 50 ft rolls, 3 3/8 in x 14 7/8in Push Plate Die Cuts, and Custom Sizes
- Transparent
- Durable, flexible polymeric film will not crack or peel after application
- Easy to cut to size, fit, peel and apply to commonly touched surfaces including flat, angled, curved and circular shapes.
- Adhesive also contains antimicrobial which leaves residual after removal
- Safe to use around food and in food preparation areas

Where to Apply

- **Frequently touched surfaces including**:

Push plates, door handles and knobs, toilet flushers, toilet seats, appliance handles, arm rests, railings, TV remotes, push buttons, touch screens and many more.

- **Locations including**:

Homes, apartments, offices, schools, hotels, restaurants, dormitories, medical facilities, cars, buses, modular homes, boats and many more

Beware of Rapid Surface Testing for Presence of Microbes

- Devices that claim to quickly measure microorganisms on surfaces provide **false readings**
- The devices are designed to only determine whether a surface has been properly cleaned at the time of measurement
- The devices measure the presence of organic material which can include food residue as well as dead or alive microorganisms
- The devices can't tell how many live organisms are present and can't distinguish between one microorganism and another
- The devices can't measure antimicrobial activity or residual antimicrobial activity
- The devices and procedures are not EPA or FDA Approved to test for presence of microorganisms

EPA, FDA and ASTM Approved Microbe Testing

- Approved microbiology testing procedures are well known and give the most accurate, specific results for pathogens or bacteria on a surface, but results are slow and tests are expensive as they are performed under controlled conditions in an experienced lab.
- There are several procedures used to determine presence of microorganisms and antimicrobial activity on surfaces

Use of cultured media placed onto a test surface

1) A culture is prepared of a known organism such as *s. aureas*
2) The number of living organisms in the culture is measured
3) The culture is added onto the test area surface
4) After a set time period (1 hour, 24 hrs, etc) the sample is analyzed to determine number of living organisms
5) Antimicrobial activity is confirmed by the percentage reduction in living organisms over the test time period

Microbiological Testing continued

Swabbing

1) The test surface is thoroughly swabbed and the swabs
2) The swabs are placed into a specific microorganism enrichment broth. For transport to a lab and accurate results the swab samples should be frozen.
3) The sample is then transferred onto an appropriate agar plate medium for the target organism being sought.
4) Report the target microorganism as present or absent.

Testing takes 2-4 days and require a microbiologist for interpretation.

NOTE: There is no simple quick test to determine antimicrobial activity or presence of specific live organisms. Representation otherwise is false and misleading.

Product Claims Regulations

- SEAL-N-KILL falls under the EPA Treated Articles Exemption 40 CFR 152.25(a).
- Products treated with or containing EPA Registered antimicrobial agents and meeting EPA labeling requirements can be sold freely without registration if the stated sole purpose of the treatment is to protect the product itself.
- Product labeling can't make public health claims for control of specific microorganisms or classes of microorganisms that are directly or indirectly infectious. Wording such as "antibacterial," "bactericidal," or "germicidal" is not permitted.
- Antimicrobial claim must be qualified to state that protection is limited to the product itself.