

MADICO[®]

***Introduction to Neutralux[®]
Antimicrobial Surface Protection Film***

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August 17th, 2020

Welcome to Madico's Webinar Series.



*This webinar is approximately 20-25 minutes
with 5 minutes at the end for Questions.*

- All participants are on mute.
- Please locate the Chat feature.
- If you have any questions, please enter them into the Chat conversation.
- All questions will be addressed at the end of the webinar.
- A recording of this webinar will be available on MadicoU within a few days.



OUTLINE

Introduction to Antimicrobials

- What is an Antimicrobial substance?
- Function of Antimicrobial substances?
- Types of Antimicrobials

Why use Antimicrobials

- Manage bacteria growth on surface
- Help prevent spread of germs

Antimicrobial Substances

- Silver as an antimicrobial - History
- Mechanism and How does it work?

Madico's Neutralux Antimicrobial Surface Protection Film

- Product Construction
- AgION certification
- Neutralux Performance Data
- Neutralux Surface Characteristics
- Neutralux Applications



INTRODUCTION TO ANTIMICROBIALS

What is an Antimicrobial Substance?

- An antimicrobial is an agent that kills microorganisms or stops their growth. They can be grouped according to the microorganisms they act primarily against i.e. bacteria, fungi and viruses.

Function of Antimicrobial Substances?

- Antimicrobial substances are agents that can kill a wide range of microbes on non-living surfaces to prevent the spread of illness. They can also protect surface from mildew growth, discoloration, staining, odor development and surface degradation.

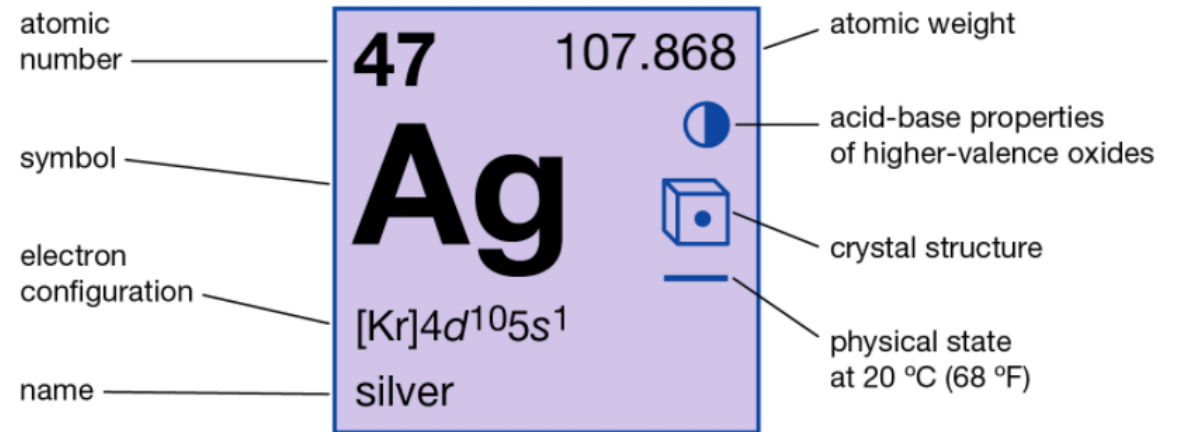


INTRODUCTION TO ANTIMICROBIALS

Types of Antimicrobials

- Antibiotics are used against bacteria
- Antifungals are used against fungi
- Antiseptics are substances applied to living tissue to help reduce infection
- Antivirals that can be used against a virus
- Substances such as silver can provide protection and have impact on multiple microorganisms

Silver



Transition metals	Solid
Face-centred cubic	Equal relative strength

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WHY USE ANTIMICROBIALS?

- There are up to 500 times more microbes on a phone than on a toilet seat.
- There are up to 75 times more microbes on a keyboard than on a toilet seat.
- The kitchen is the “dirtiest” room in your house? (i.e. more microbes than a bathroom!)
- In American hospitals alone, the Centers for Disease Control (CDC)* estimates that HAIs account for an estimated 1.7 million infections and 99,000 associated deaths each year. Of these infections:
 - 32% of all healthcare acquired infection are urinary tract infections
 - 22% are surgical site infections
 - 5% are pneumonia (lung infections)
 - 14% are bloodstream infections

* <https://patientcarelink.org/improving-patient-care/healthcare-acquired-infections-hais/>

ANTIMICROBIAL ELEMENTS & HISTORY

Antimicrobial Elements

- Silver (Ag^+), Copper ($\text{Cu}^+/\text{Cu}^{2+}$), Zinc (Zn^{2+}) and Gallium (Ga^{3+})
- Polymers charged with quaternary amines

History – Use of Silver as an Antimicrobial Agent

- 1500 BCE: Therapeutic purposes - Han Dynasty, China
- 69 BCE: Treat ulcers and wound healing
- 79 AD: Egypt - Long-term water storage
- 700's - 900's: Blood Purifier
- 1880's: Crede's silver nitrate eye drops for infants
- 1960's: Silver compounds begin to be used in burn wards
- 2000's: Agion antimicrobial used in "in body" medical devices (catheter)
- 2009: Madico introduces AMO (Anti-Microbial Film) now referred to as **Neutralux**



WHY USE SILVER & ANTIMICROBIAL MECHANISM

Why Silver?

Antimicrobial properties of silver have been known for a long time. In ancient times, silver salts were used to disinfect and preserve food and water. Silver kills microbes when it is oxidized and releases silver ions. Nowadays, many bacteria become resistant to antibiotics, so silver is increasingly being used in disinfectant solutions, and as a component of various coatings in ionic or nanoparticle forms.

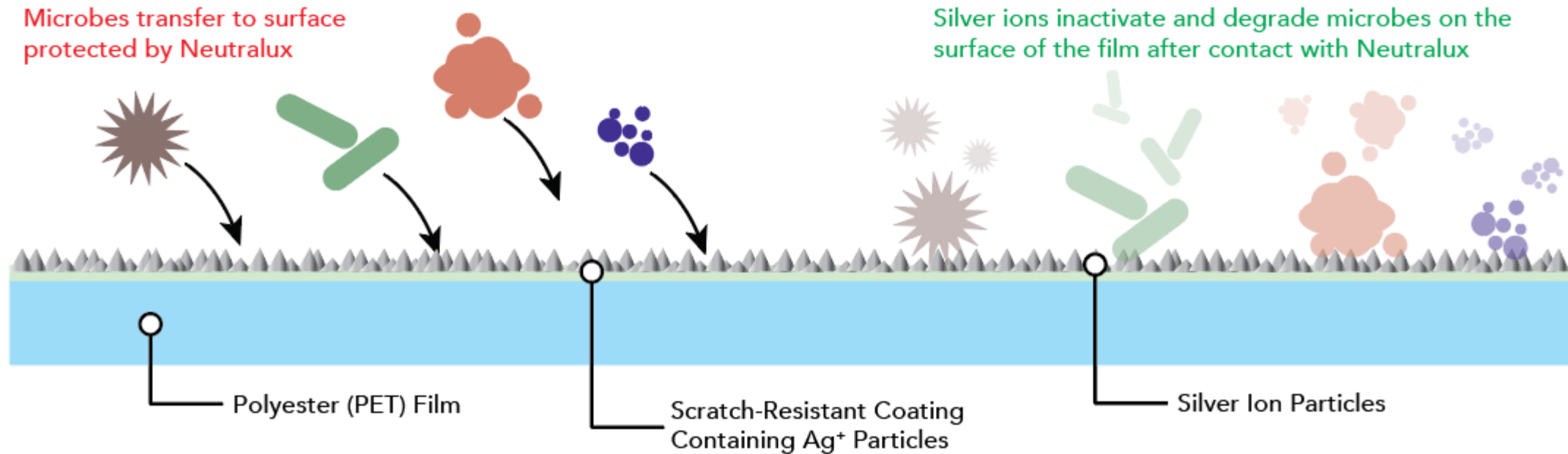
Mechanism

Silver ions attack multiple targets in the microbe to prevent it from growing into a destructive population.

1. Prevents respiration by inhibiting transport functions
2. Inhibits cell division (reproduction)
3. Disrupts cell metabolism



HOW IT WORKS



Microbe cell function is disrupted and growth is inhibited.



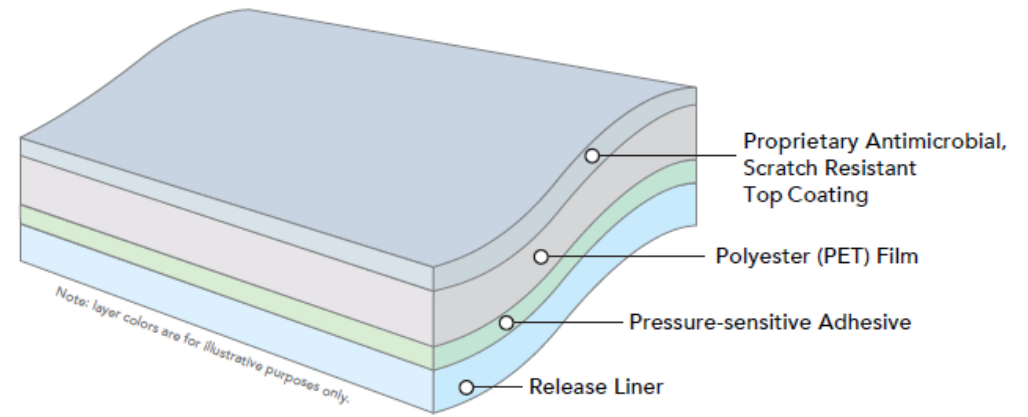
NEUTRALUX - PRODUCT CONSTRUCTION

Madico's Neutralux is a 4 mil film combined with a silver-based top coat and hard coat that makes it microbial and scratch resistant. The film can be applied to surfaces in order to inhibit growth of microbes, which can cause odors and stains. Madico's top coat continuously kills microbial contaminants and resists microbe growth on the surface of the film, providing the film with built-in protection without releasing toxic substances into the environment. The active ingredient in the top coat is EPA-registered and FDA listed. Neutralux can be replaced as needed based on the degree of wear and traffic.

Material Construction:

- Top coat.....0.20 mil
- PET.....4 mil
- Adhesive layer.....0.80 mil
- Release liner.....1 mil
- Total laminate thickness.....6 mil

All thicknesses are based on nominal data.



NEUTRALUX ACTIVE ANTIMICROBIAL INGREDIENT - AGION®

Environmental Protection Agency (EPA)

- Registered as a preservative & bacteriostatic agent for broad range of uses
- For treated articles under 40 CFR 152.25(a)
- Can be incorporated into fibers, polymers, coatings
- Designed to protect the product (treated article claim)

Food & Drug Administration (FDA)

- Listed under the FDA Food Contact Substance Notification for use in all types of food-contact polymers in 21 CFR, Parts 174 through 186

Europe Biocidal Products Directive 98/88/EC

- Silver is an existing active substance under the BPD

European Food Safety Agency

- Approved for plastics, polyolefins and poly (alkylene terephthalate)



ANTIVIRAL PROPERTIES OF AGION[®] - TEST RESULTS

Chinese CDC (2003)

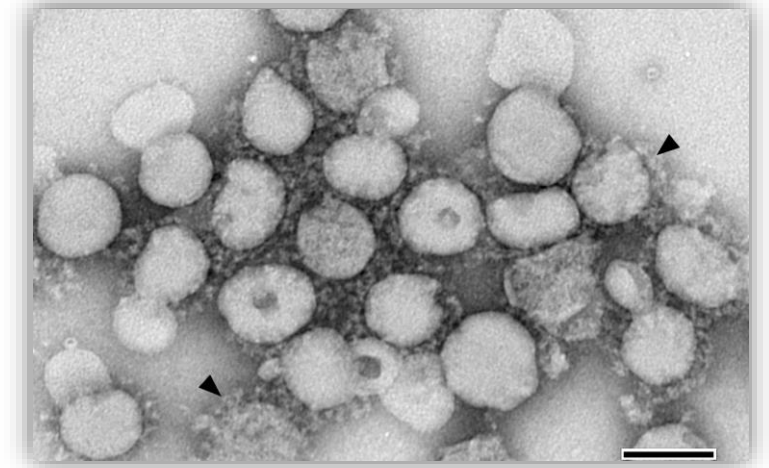
- Complete inactivation of SARS Virus in 2 hours

University of Arizona (2004)

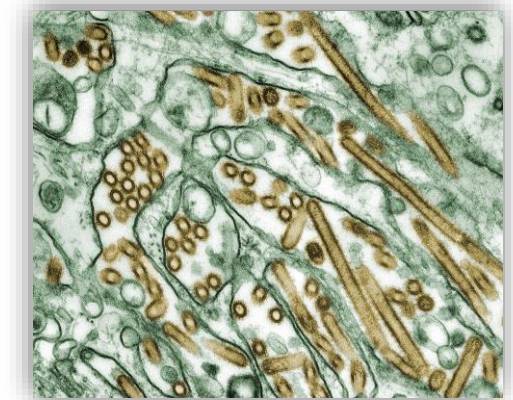
- 90% reduction of SARS Virus (229E) in 1 hour
- 99% reduction of SARS Virus (229E) in 2 hours
- 99.999% reduction of SARS Virus (229E) in 24 hours

Chinese Academy of Agricultural Sciences (2006)

- 99% reduction of H5N1 avian influenza in 10 minutes



Microscope image of SARS

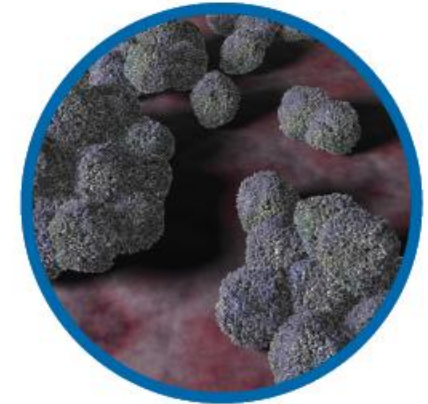


Microscope image of H5N1 Avian Flu

NEUTRALUX EFFICACY – PERFORMANCE DATA

Efficacy of Neutralux*

Microorganism	% Reduction over 24 hours
Bacillus cereus	99.9955%
Pseudomonas aeruginosa	No live cells
Streptococcus pneumonia	No live cells
Escherichia coli	99.9999%
Staphylococcus aureus	99.999%
Klebsiella pneumonia	99.9998%
Acinetobacter baumannii	99.9978%
Candida albicans	99.981%
Aspergillus niger	99.91%



*JIS Z 2801 Antimicrobial products – Test for antimicrobial activity and efficacy.

NEUTRALUX – SURFACE CHARACTERISTICS & PROPERTIES

Neutralux adheres to the following surfaces:

- Glass
- Aluminum
- Wood
- Natural Stone
- Stainless Steel
- Marble

* Blister Free Neutralux adheres to the following surfaces:

- Polycarbonate
- Acrylic

**Product is under development*

- Extremely hard and durable surface
 - Pencil Hardness >6B
 - Taber Abrasion Δ Haze <2%
- Excellent dimensional stability
- Visible Light Transmission (VLT) >90%
- Efficacy has been proven in independent laboratory testing
- Does NOT impact human health

Chemical Resistance of Top Layer

Disinfectants.....	Excellent
Water.....	Excellent
Mild Acids.....	Excellent
Salts and Alkaline.....	Excellent
Petroleum-based Grease.....	Excellent
Oils.....	Excellent
Solvents.....	Excellent



NEUTRALUX - APPLICATIONS



- Touch screens
- Tables
- Door push/pull plates
- Face shields
- Grocery cart handles

- Medical equipment
- Food trays
- Display counters
- Walls & partitions
- Display screens

- Counter tops
- Handles & hand rails
- Toilet seats
- Baby changing stations

- Arm rests
- Restroom stalls
- Elevators
- Hotel TV remotes
- Key pads





QUESTIONS?



Upcoming April Webinars



- **August 26** – Benefits of Joining IWFA
- **Sept. 15**– How to Advertise on Social Media



THANK YOU

