



**SILVER** GUARD

*Coronavirus*

# HISTORY OF THE USE OF SILVER FOR ITS

**Ancient Greeks**  
used silver vessels for water purification and placed silver dollars in their wooden water casks and milk containers to delay spoilage, prevent dysentery, and prevent illnesses.

**In the Middle Ages**  
silver spoons were used to feed the infants of wealthy royal families. They believed that those "born with a silver spoon in their mouths" benefited from silver's purifying and antibiotic properties.

**In the 1800's**  
they used silver nitrate in newborn infant's eyes to prevent post-delivery infections.

**Settlers in the Australian outback**  
added silverware in their water tanks.

**During the times of "America's Old West",**  
silver coins were put into drinking water barrels, for protection against water-borne illness.



# ANTI-BACTERIAL AND ANTI-VIRAL PROPERTIES



## *During the World War I,*

Colloidal Silver was also adopted as a treatment for infections.



## *During the Civil War,*

silver was used to treat syphilis.



## *During the mid-1960s*

NASA created a lightweight generator to distribute silver ions into the drinking water aboard the Apollo spacecraft.



## *Today,*

silver is used in dentistry for a variety of purposes, ranging from fillings, braces and tools.



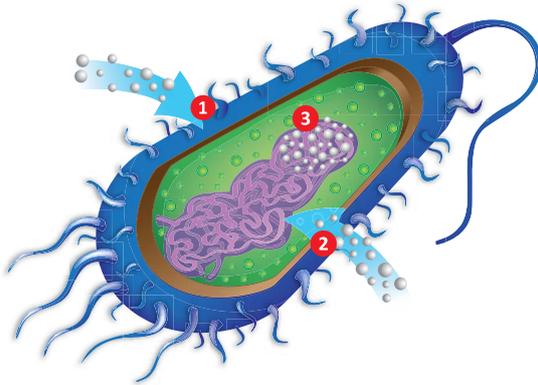
## *Today,*

Silver is the basis of countless innovations, ranging from deodorant formulas, bandages and silver finishes in a variety of textiles.



# SILVER EFFECTS, ON BACTERIA

Silver ions are now considered a viable alternative to antibiotics and seem to have a high potential to solve the problem of the emergence of bacterial multidrug resistance. In particular, silver particles (AgNPs) have attracted much attention in the scientific field. Silver has always been used against various diseases; in the past it found use as an antiseptic and antimicrobial against Gram-positive and Gram-negative bacteria due to its low cytotoxicity.



1. Silver ions ( $\text{Ag}^+$ ) bind to the bacterial cell wall blocking transport of substances in and out of the cell.
2. Silver ions are transported into the bacterial cell where they block the respiratory system destroying energy production.
3. In the bacterial cell silver ions interact with DNA and inhibit bacterial cell division stopping replication.

Silver ions perform their deadly work by punching holes in bacterial membranes and wreaking havoc once inside. They bind to essential cell components like DNA, preventing the bacteria from performing even their most basic functions.

## References:

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6272636/>

<https://www.sciencemag.org/news/2015/05/silver-turns-bacteria-deadly-zombies>

# SILVER EFFECTS ON VIRUSES

Newer clinical laboratory research demonstrates that silver is so powerfully effective against viruses, it even stops the deadly HIV (i.e., the AIDs virus) from infecting human cells. Research dating back to the 1980's demonstrates that silver can stop numerous types of viruses from replicating, simply by bonding to them. In fact, silver altogether decimates many viruses, simply by being in close contact with them.

## Examples:

- During the Spanish Flu in 1918, the proprietary silver-based antimicrobial ointment Argyrol was applied to nasal mucous membranes to prevent infection.
- Silver nanoparticles undergo a size-dependent interaction with herpes simplex virus types 1 and 2 and with human parainfluenza virus type 3.
- In a study published in the Pharmaceutical Chemistry Journal back in September 1992, it was found that that several different preparations of colloidal silver showed amazing efficacy against the smallpox virus.
- SARS coronavirus: Chinese Centre for Disease Control against SARS, found that small amounts of silver particles begin killing the virus within four hours, and destroy all SARS viruses within 24 hours.
- Silver was found to prevent replication of Hepatitis B Virus.

## References:

[https://www.coloplast.com/products/wound/articles/silver-a-powerful-weapon-against-microbes/#section=Reference-list\\_463946](https://www.coloplast.com/products/wound/articles/silver-a-powerful-weapon-against-microbes/#section=Reference-list_463946)

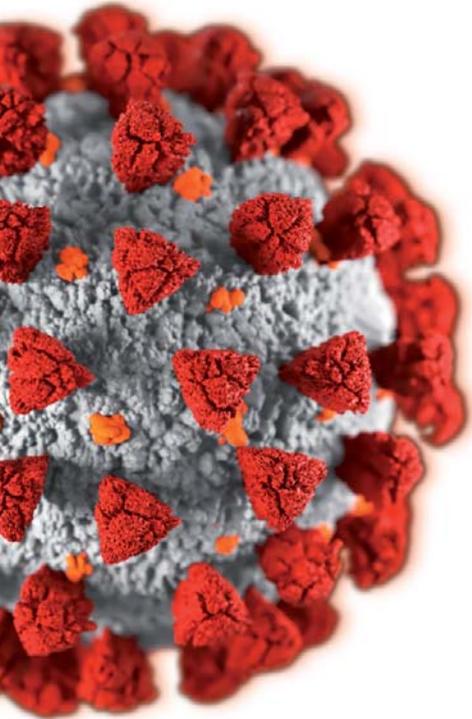
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3826769/>

<https://www.sciencedirect.com/science/article/pii/S0304389416302382>

<https://www.purecolloids.co.uk/index.php/31-pages/case-studies/67-undeniable-industry-leader>



# ASSUMED EFFECTS OF SILVER IONS, SPECIFICALLY ON CORONAVIRUSES



Medical pre-print servers include comprehensive studies from Italy, Israel and China, suggesting that the inhalation of silver nano particles as a treatment for Covid-19 patients.

It is strongly assumed that they inhibit the replication of Coronavirus and destroy them on direct contact. Hereby it is still being studied whether it is the silver particles that have a stronger effect or the silver ions that they release.

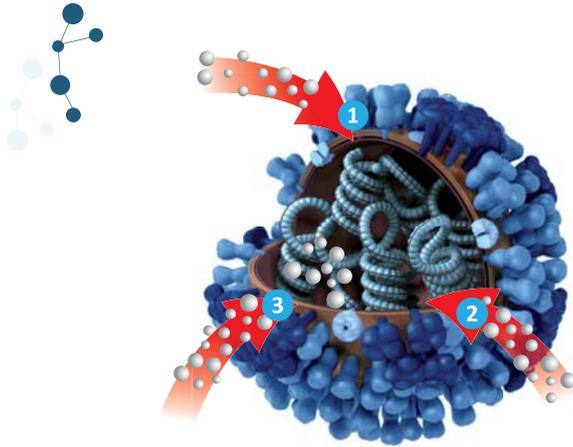


## References:

- [https://www.researchgate.net/publication/340270205\\_Formulations\\_for\\_COVID-19\\_Treatment\\_via\\_Silver\\_Nanoparticles\\_Inhalation\\_Delivery](https://www.researchgate.net/publication/340270205_Formulations_for_COVID-19_Treatment_via_Silver_Nanoparticles_Inhalation_Delivery)
- <https://www.sciencedirect.com/science/article/pii/S0142961214000842?via%3Dihub>
- <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6264685/>
- <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6412188/>

# HOW IT WORKS

When silver comes into contact with Oxygen, oxidation occurs which causes the release of positively charged silver ions. Silver ions are also released from the silver particles when they come into contact with moisture, such as body fluids.



## HOW SILVER IONS WORKS

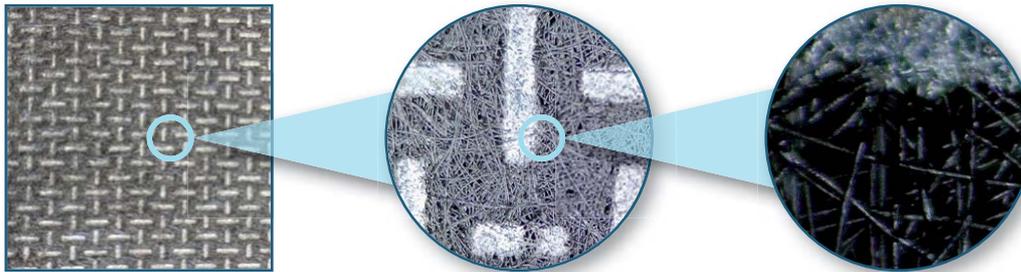
They inhibit the reproduction of the microbe by:

1. Silver ions breaking through the cell wall.
2. Silver ions disrupting the respiration of the microbe.
3. Silver ions attaching to the DNA of the microbe to stop cell replication.

Silver ions pierce through the external surfaces of the cells and damage their DNA, as well as the protein structure, halting their metabolism and reproduction until they die. Since the silver ions are positively charged and the viruses negatively, they attract each other like magnets. This makes the process very rapid. Inhibition occurs in seconds, and destruction in only minutes.

## SILVERGUARD – “EARTH” FOR FACEMASKS

The product „Earth“ from KC’s Silverguard range is a densely constructed nonwoven product. All of it’s fibers are fully enveloped by 99.9% pure silver.



When this product is used as a facemask layer, the inhaled air is sent through a vast jungle of silver covered polyamide fibers. Bacteria and viruses are forced into direct contact with the fiber walls and flooded with silver ions. The surface area of the silver on all the fibers maximizes the release of Silver ions and additionally provides a particle filtration effect.

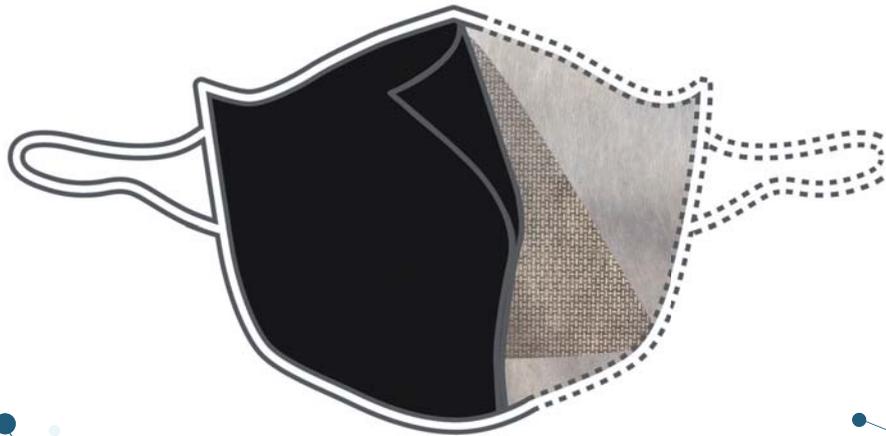


# SILVERGUARD – THE USE OF “EARTH” IN FACEMASKS



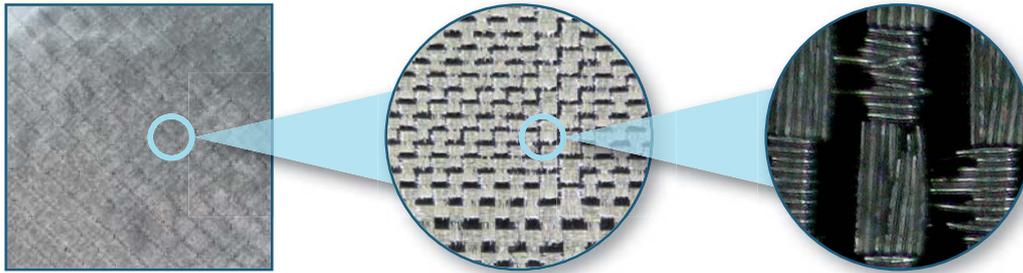
The advantages of „Earth“ for the use in facemasks are clear and convincing:

- ✓ The silver content is 20%. This is 20 times larger, when compared to many silver finishes in ordinary textiles.
- ✓ The nonwoven surface structure maximizes the surface area in which the silver can take it's useful effect.
- ✓ When microbials like bacteria and viruses travel through this dense silver jungle, the harm that is inflicted on them is maximized and greatly accelerated.



## SILVERGUARD – THE USE OF “JUPITER”

The product „Jupiter” from KC’s Silverguard range is a densely woven product in a parachute weave construction. All of it’s filaments are fully enveloped by 99.9% pure silver.



When this product is used as a pocketing material for a self sanitizing pocket, the object that is placed in the pocket will be flooded with silver ions. The bacteria and viruses will be neutralized in only minutes.

# SILVERGUARD – THE USE OF “JUPITER”

A sterilizing facemask pocket is the ideal added feature of garments of all kind, especially as consumers are now more aware of the lasting danger that comes from bacteria and viruses. Sanitizing pouches and handkerchiefs are further useful accessories.



**SILVER POUCH  
FOR FACEMASKS**



**SILVER  
HANCKERCHIEFS**

**SILVER POUCH FOR  
SMARTPHONES**



**SILVER  
FACEMASK POCKET**





• WEARABLE TECHNOLOGIES •



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