

Hand Sanitizer Product Line White Paper

A product suite scientifically proven to kill dangerous bacteria and viruses for 4+ hours with one application.

- COVID-19
- C. difficile & C. difficile spores
- MRSA
- Other dangerous pathogens



Meditizer
Medical-Grade Hand Sanitizer



02.01 - The Mission

Our Mission and Goals

Our Immediate and Future Mission

As the world is locked in a cycle of uncertainty due to the novel COVID-19 virus, personal preventative measures are key to returning our societies and economies to a greater degree of normalcy. While social distancing and face coverings are chief among these measures, unique products are needed to fill the gaps and help reduce the risk of transmission.

Though COVID-19 remains at the forefront of global concerns, the climbing rate of hospitalizations has brought to light the need to combat many other harmful and infectious pathogens. Bacteria such as *Clostridium difficile* (C. diff), *E. Coli*, *Burkholderia cepacia*, Methicillin-resistant *Staphylococcus aureus* (MRSA) and many other pathogens have proven to be formidable adversaries in their own right.

Our mission is to supply a suite of products that are clinically proven to kill these pathogens and help protect front line workers and essential personnel while they perform their jobs. The average citizen can also greatly benefit from having access to technology that can help them reduce the risk of incidental transmission. The need for these products extends far beyond the end of this current pandemic. They will always be needed to help mitigate the risk of infection and transmission.



Act 1 - COVID-19

A scientifically proven, continuous 4+ hour kill rate with a single application of both the Hand Sanitizer and Mask Spray Products gives us a powerful new weapon against the transmission of this novel virus.

Act 2 - C. DIFFICILE & SPORES

C. diff transmission and infection is a serious concern in the medical arena. This harmful bacteria and its spores are very difficult to kill. Our products are scientifically proven to kill both with a 5.2+ log reduction over 30 seconds.

Act 3 - OTHER PATHOGENS

Our products do not just kill COVID-19 and C. diff. They are effective in killing many other harmful bacteria and viruses that may plague us now or in the future.

03.01 - The Technology

Copper & Magnesium Microplatelets

Copper infused Magnesium Hydroxide Microplatelet Technology.

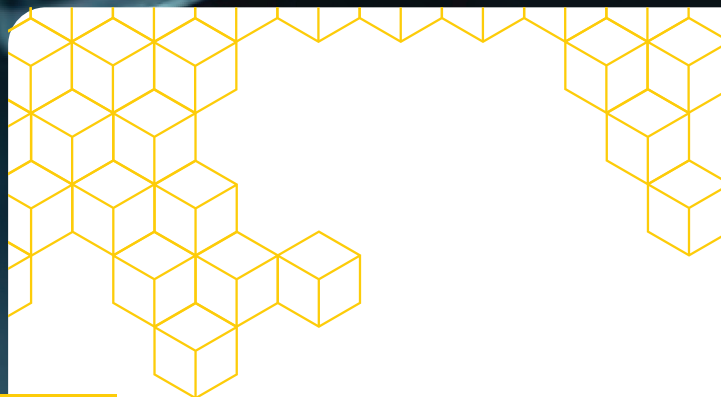
This technology represents a novel material science comprising discs or wafers of Magnesium Hydroxide molecules arranged in 'sheets' or 'layers'. This results in extremely large surface area with potentially reactive hydroxyl groups studding the surface.

Microplatelets (MP's) require contact between themselves and the target microorganism or virus. MP action is focused and direct. Our typical MP configuration is a disc of 200 nm x 100 nm x 10 nm. For comparison is about one tenth of the length of an E.coli bacterium (1,000nm), and about 2/5 it's width (500 nm).

For further reference, the COVID-19 Coronavirus is a sphere of about 125 nm in diameter. These size relations indicate that Microplatelets are in the size range of a number of pathogens and the intimate contact that occurs between the surface of MicroPlatelets and target microorganisms is key to MP antimicrobial potency.

Copper, long known for its anti-microbial properties, is then infused onto the surface of these Magnesium Hydroxide Microplatelets. This combined with the reactive hydroxyl effects of the platelet itself and aided by the addition of Benzalkonium Chloride work in unison to destroy the target micro-organisms.





Magnesium Hydroxide Microplatelets



Magnesium has very unique properties that make the perfect material for MP's.

Infused Copper



Copper has been exploited for its health benefits since ancient times.

Benzalkonium Chloride



Benzalkonium Chloride is recommended by the FDA for sanitizing purposes.

Patent Pending Technologies are the essence of these products.

Surface Area is the key

The key to our technological advantage is in the microplatelet itself. Our partner has developed a cutting edge material science manufacturing method that produces flat plates rather than nodules. Nodules, while possessing a large roughly spherical surface area, have the disadvantage of a very low potential contact area with regards to viruses, bacteria, and other pathogens. Since our kill methodology requires surface contact, it is essential that we have as large a surface area for the pathogens to interact with as possible.

Infused Copper adds to the kill rate

Copper has been exploited for health purposes since ancient times. The process involves the release of copper ions (electrically charged particles) when microbes, transferred by touching, sneezing or vomiting, land on the copper surface. The ions prevent cell respiration, punch holes in the bacterial cell membrane or disrupt the viral coat and destroy the DNA and RNA inside.

These technologies have U.S. patents and patents pending status which is shown in the Documentation section of this white paper.



Benzalkonium Chloride

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- » U.S. FDA recommends Benzalkonium Chloride as an effective sanitizer.
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- » Has recently shown a marked reduction in colony forming units over a several hour period after an extensive antibacterial study.
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- » Studied for virucidal properties against influenza, Newcastle disease, and avian infectious bronchitis.

The FDA has recently indicated support for one of our key ingredients, Benzalkonium Chloride (BZK). BZK is thought to work by cation (positive ion) donation or surfactant activity, either of which have the effect of disrupting the bacterial membrane or viral envelope. In recent clinical studies to demonstrate persistent antibacterial efficacy of a hand sanitizer, BZK produced a marked reduction in colony-forming units at each time points tested at one hour, two hours, and three hours of (3.75-4.16-log₁₀ reductions).

This active ingredient also actively assists by disrupting the cell membranes of the target organisms and is active at relatively low concentrations (0.12%-0.13%). Benzalkonium chloride has also been studied for virucidal activity against influenza, Newcastle disease, and avian infectious bronchitis viruses.



03.04 - Killing Mechanism

Key Facts and Highlights.



Proven Results

ASU's BSL3 Lab from the Bio Design institute and the Southwest College of Naturopathic Medicine & Health Sciences conduct our SARS-CoV-2 test



Prolonged Kill

Test results show a continuous kill rate of more than 4 hours on viruses and bacteria.

How It Works

Viruses and micro-organisms such as bacteria exist within a gel like capsid envelope which protects them from the normal environment. This biofilm surrounds the virus or bacteria and is largely responsible for keeping it viable between hosts. Bacteria within these biofilms are over 1,000 times more resistant to antibiotics. Essentially, the antibiotics can not penetrate the biofilm layer to work against the pathogen contained within.

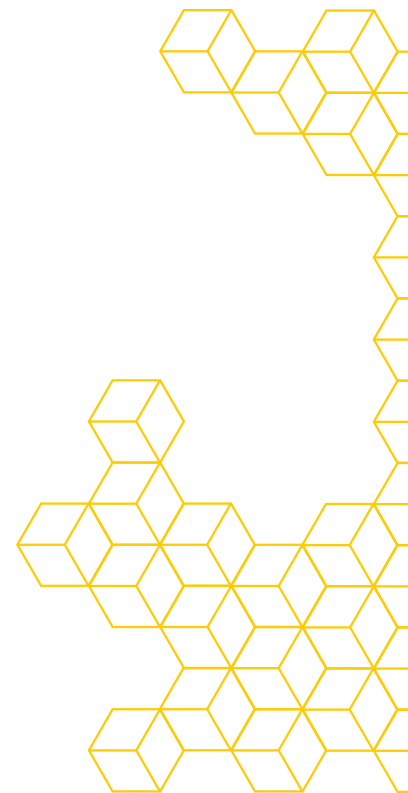
MicroPlatelets kill from the outside. Unlike other approaches, MicroPlatelets are not ingested by the bacteria or fungi. MP's are not taken up by cells. Their surface area render them too large for this concern. They interact with the biofilm directly.

Our MicroPlatelet technology is designed to destroy this biofilm by a chemical/mechanical means, destroying the capsid envelope and ultimately killing the virus, fungi or bacteria hidden inside. The MicroPlatelet is unaffected by this interaction and can survive the encounter to continue killing destroying any biofilm it comes in contact with. Thus, the prolonged and sustained killing effect is realized.



04.01 - Water Based Advantages

Moisturizing, non-alcohol based



4.1 Drawbacks of Alcohol Based Hand Sanitizers

Alcohol based hand sanitizers have several drawbacks versus water based sanitizers. Alcohol based gels or foaming sanitizers tend to dry out the hands by effectively flushing the natural oils from the skin. These oils act as both a skin moisturizer and as part of the body's anti-microbial defense system.

By flushing these oils from the skin, there is a greater chance of hands drying and cracking. Dry hands lead to tiny fissures in the skin that can run deep into the epidermis. These fissures allow additional entry points for harmful bacteria and viruses to enter the body. A moisturizing, water based sanitizer keeps the hands from drying out thereby reducing this risk.

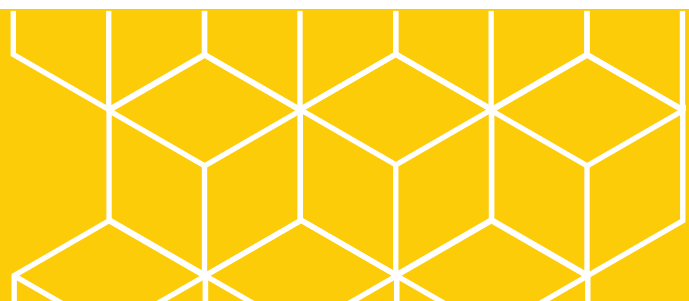
Additionally, alcohol based sanitizers typically use either alcohol or isopropanol. Both are highly flammable substances. The FDA recommends concentrations between 60-90% for maximum efficiency in killing germs. At these high concentrations, these sanitizers become fire hazards.

Hospitals and other medical facilities are required to consult with local fire authorities and adhere to strict regulations and codes regarding flammable substances. This can result in the alcohol based sanitizer being placed in awkward and inefficient locations for routine staff access when placing dispenser stations or storing large quantities of the sanitizer.



4.2 Benefits of Our Water Based Hand Sanitizer Solutions

- » Moisturizes the skin while effectively killing 99.9% of harmful bacteria and viruses on contact.
- » Continues to kill for a period of time longer than that of an alcohol based sanitizer after the solution has dried on the skin.
- » Hypoallergenic Formulation for less skin irritation.
- » Uses a Federally approved effectiveness protocol.
- » Protects against germs and fungus.
- » Works synergistically with the hands natural defenses.
- » Painless application for those with cuts, scrapes, or other wounds on the hands. .
- » Delivered as a pleasant lotion and dries within 30 seconds leaving the hands feeling soft and clean.
- » Nontoxic formula is safer for children if accidentally ingested.
- » Is non-flammable and will not stain surfaces.
- » Will not dry out and crack the skin.
- » Works synergistically with the hands natural defenses.



05.01 - COVID-19 Assay

Summary of SARS-Cov-2 Assay

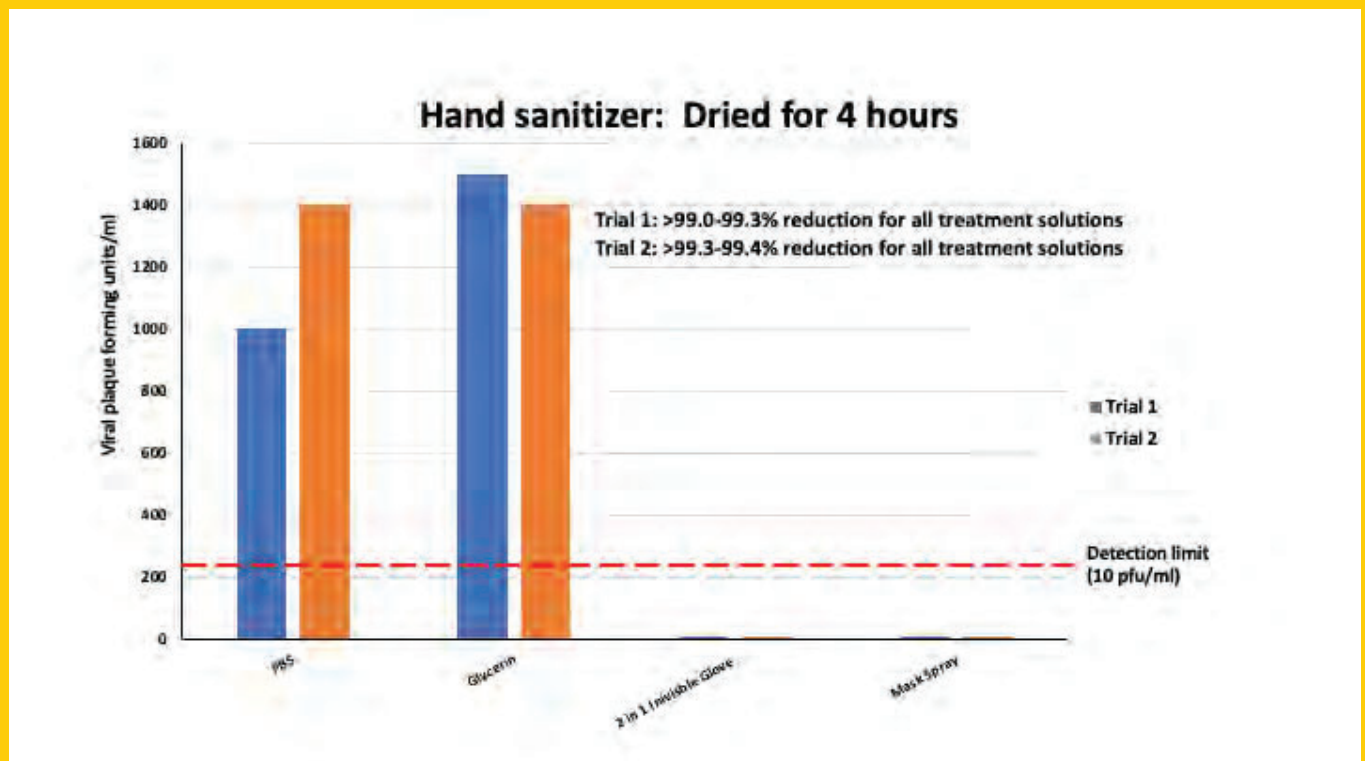
In February of 2021, the Arizona State University's Biodesign institute in conjunction with the Southwest College Of Naturopathic Medicine & Health Sciences conducted an assay to characterize the long term antimicrobial properties of our sanitizing products. The following are the results of that assay.



05.02 - Test Results

4+ Hour Kill Time Claim, Confirmed!

The results of this study, conducted in a certified Biosafety Level 3 facility, support that the 2 in 1 Invisible Glove and Mask Spray products are all able to kill the SARS-CoV-2 virus even after drying on a surface for 1 hour or 4 hours.



06.01 - Bacteria Kill Rate

Summary of Bacteria Kill Rate Test.

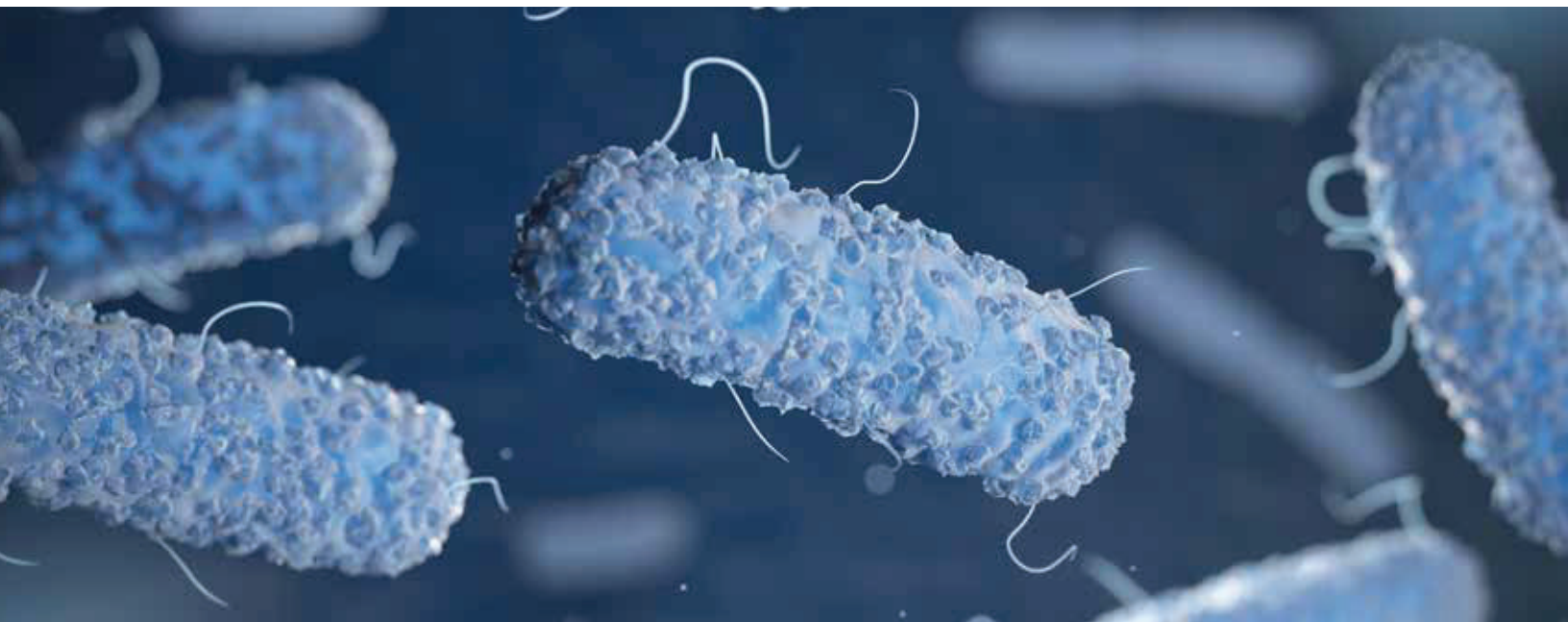
In a test conducted in September of 2020, by Microconsult Inc., a microbiological & analytical testing laboratory, conducted a kill rate test. The following are the results of that test.

Bacteria	30 seconds	Log Reduction	60 seconds	Log Reduction
C. difficile	No Growth	5.38	No Growth	5.38
C. difficile (spore form)	No Growth	5.22	No Growth	5.22
MRSA	No Growth	5.88	No Growth	5.88
L. monocytogenes	No Growth	5.78	No Growth	5.78
E. Coli	No Growth	5.93	No Growth	5.93
P. aeruginosa	No Growth	5.75	No Growth	5.75
B. cepacia	3.10	3.30	No Growth	5.8
S. enterica	No Growth	5.77	No Growth	5.77
E. faecalis	No Growth	5.95	No Growth	5.95
K. pneumoniae	15	4.40	No Growth	5.58
S. pyogenes	No Growth	5.41	No Growth	5.41
C. jejuni	No Growth	5.38	No Growth	5.38

6.2 Explanation of Results

The 2 in 1 Invisible Glove was tested in a Kill Rate Study using eleven bacterial species by a leading microbiological testing facility. The exposure times were 30 and 60 seconds. The 30 second exposure killed all of the organisms from (> 105 cfu/mL) from nine of the species and greater than three log₁₀ from the other two. The 60 second exposure killed all of the organisms from all eleven species.

A second Kill Rate Study was performed on the spore stage of *C. difficile* using the same exposure times. Both the 30 second and 60 second exposures showed complete kill of the test organisms. These data show a very high degree of efficacy suggesting that this hand sanitizer could have a strong impact on bacterial transmission. The action against the spores of *C. difficile* is particularly remarkable.



07.01 - Manufacturing Capabilities & Shipping



Packaging

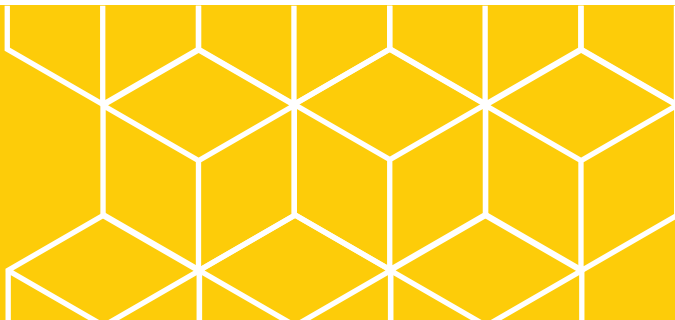
A wide range of packaging are available. Typically, the 2 in 1 Invisible Glove is packaged in 1oz airless pumps, 4 oz squeeze bottles, and various automatic dispenser bladders. However, any size from 1/2 gallon to sachets can be accommodated.

Bulk Shipments

Bulk shipments of product can be delivered in 5 gallon pails, 30 gallon drums, 55 gallon drums, or 250 gallon totes. These can be shipped domestically or internationally as needed.










Production Capacity

Our manufacturing partner has many production facilities in Tennessee, USA and abroad. As of this writing, the production capacity is over 20,000 gallons per day, per shift. New production facilities have been purchased and are in the construction phase. Once complete, the production capacity will be doubled. Greater production capacity will be addressed as needed.



08.01 - Documentation

List of attached documents.

-  **Product Sales Sheets**
Product Descriptions
-  **ASU BSL3 Lab Results**
Dr. Jeff Langland
-  **Kill Rate Results**
Microconsult
-  **Product Safety Report**
Dr. John Harbell
-  **Benzalkonium Chloride Study**
Dr. John Harbell
-  **Summary of Antimicrobial Effects**
Dr. John Harbell
-  **Platelet Technology White Paper**
LifeHope Health LLC/BiocellereX
-  **FDA NDC Listing**
FDA Website Listing
-  **Cost Comparison Analysis**
LifeHope Health LLC



09.01 - Conclusions

White Paper Summary

Meditizer Hand Sanitizing Product Line Summary

Our revolutionary product line utilizes cutting-edge material science to achieve unparalleled killing power against a wide range of harmful microorganisms. The Patented and Patent **pending** microplatelet technology utilized, coupled with copper and benzalkonium chloride, provides for a highly effective product. In addition to being extremely efficacious, our water-based solution removes the harmful side effects of alcohol-based solutions and provides a much safer product.

Recent scientific studies conducted at highly reputable labs show that the products kill the novel SARS-CoV-2 (COVID-19) virus with a 99.99% continuous kill rate over more than 4 hours, while also killing *c. difficile* active cultures and spores as well as many other dangerous pathogens, all with a single application. These products are true game changers, adding an essential layer of protection in the fight against dangerous diseases.

We hope you now share our enthusiasm for these products and can help us set them to work in more common usage. Together, we can help make a positive change by helping to reduce the spread of dangerous pathogens and disease.

