

# Coronavirus (COVID-19) Z BioScience Protocol



The Coronavirus can be transmitted by direct human contact (cough, sneeze, or other mucous contact) or by contact with the virus on an inanimate surface. The Z BioScience Protocol is designed to help avoid the transmission of the virus via contact with inanimate surfaces.

As to how long the virus can survive on inanimate surfaces, CDC Director Dr. Robert Redfield told U.S. lawmakers on Thursday (February 30th, 2020):

- *“On copper and steel, it’s pretty typical, it’s pretty much about two hours”,* referring to how long the new coronavirus may be active on those types of materials.
- *“But I will say on other surfaces - cardboard or plastic - it’s longer, and so we are looking at this.”*

The statement from Dr. Redfield is accurate for the very top of surfaces, HOWEVER, there is an additional complicating factor affecting this virus’s survivability on surfaces: surface biofilm.

The Coronavirus may be active for two hours above the biofilm, but it can live indefinitely within the protection of the biofilm.

Consequently, it is critically important that the surface be cleaned down to the microbial level if disinfectants that can kill the virus on contact are to be effective.

## The Coronavirus (COVID-19) Z BioScience Protocol is as follows:

**Step 1 – Clean:** Thoroughly clean surfaces with [Z BioScience Multi-Task Probiotic Cleaner](#) to remove soils and organic contaminants and clean to the microscopic level. Follow the directions on the label for excellent results. A label copy is attached for reference.

**Step 2 – Disinfect:** Apply a disinfectant of your choice following thorough cleaning as specified in Step 1 above. Please note that the product should be solely a disinfectant (and not a combined cleaner and disinfectant) because the combination products have been shown to be ineffective at both functions (cleaning and disinfection).

**Step 3 – Protect:** Apply [Z BioScience Enviro Mist Probiotic Microflora Spray](#) to cover the surfaces with a probiotic layer that will act as a barrier to pathogens on the surface. The probiotics create an environment that is inhospitable to both pathogenic bacteria and viruses and prevent the reestablishment of pathogenic biofilm. A label copy of Z BioScience Enviro Mist is attached for reference.

## The CDC Recommended Protocol - Minimum Two Step Process:

For surface disinfection to be effective, a Two Step protocol must be implemented:

- **Step 1** – CLEAN surfaces thoroughly to remove soils (organic and inorganic).
- **Step 2** – DISINFECT according to product label instructions after cleaning.

The First Step, cleaning all surfaces prior to applying disinfectants, is mandated by:

- US Centers for Disease Control and Prevention (CDC),
- Disinfectant / Sanitizer manufacturer’s product usage instructions

The CDC's "Factors Affecting the Efficacy of Disinfection and Sterilization" calls for:

- 'Meticulous cleaning' of surfaces before application of a disinfectant. <sup>1</sup>

The CDC cites several reasons, including the following:

- Organic matter can interfere with the antimicrobial activity of disinfectants in at least two ways.
  - Most commonly, interference occurs by a chemical reaction between the germicide and the organic matter resulting in a complex that is less germicidal or nongermicidal, leaving less of the active germicide available for attacking microorganisms.
  - Alternatively, organic material can protect microorganisms from attack by acting as a physical barrier; (i.e. biofilm).
- The effects of inorganic contaminants on the sterilization process show the protection by inorganic contaminants of microorganisms to all sterilization processes.

These statements by the CDC emphasize the critical importance of thoroughly cleaning before any disinfection procedure, because both organic and inorganic soils are best removed by surface cleaning agents, not disinfectants.

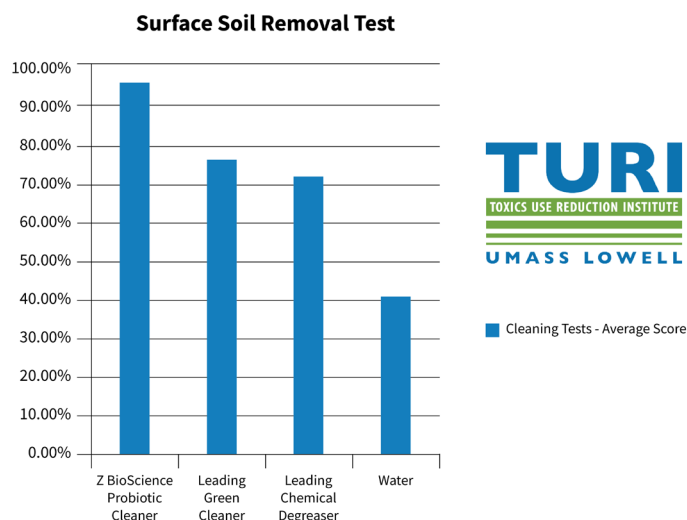
## Step 1 - Surface Cleaning – THE MOST IMPORTANT STEP Z BioScience Probiotic Microflora Enviro Mist

### Soil Removal

Z BioScience's Probiotic Biosurfactant Cleaners represent the best products for this First Step of cleaning surfaces to remove surface soils, (organic and inorganic).

First and foremost, Z BioScience's Probiotic Biosurfactant Pre-Disinfection Cleaner has been tested for its surface soil removal capacity by the Toxic Use Reduction Institute (TURI Labs) at UMASS (Lowell), and shown to remove 95.2% of surface soils, placing it in the top tier of cleaning agents tested.

### Soil Removal Test - TURI Labs:



### Use of ATP to Determine Efficacy of Cleaning:

It is important to be able to objectively, scientifically measure, on-site and in real time, the efficacy of any cleaning process undertaken in preparation for the application of a disinfectant protocol to address critical public health risks.

Measuring ATP levels is the chosen method for the Food Processing and other industries to determine in a timely, accurate and cost effective manner the efficacy of their cleaning protocols.

ATP (Adenosine Triphosphate) is an energy molecule that is present in all living cells. If it is alive or was once alive, it contains ATP. This includes animal cells (dust, oils), plant cells (soils, oils), and bacterial cells (bacteria, viruses). As such, measurements of ATP correlates to how clean a surface is.

<sup>1</sup> <https://www.cdc.gov/infectioncontrol/guidelines/disinfection/efficacy.html>

The less ATP, the less soil and contaminants, and the cleaner the surface is.

The International Sanitary Supply Association (ISSA), and the US Department of Agriculture (USDA), both endorse the measurement of Adenosine Triphosphate (ATP) as an accurate, affordable, on-site real-time means of determining the efficacy of cleaning products and protocols.

Z BioScience's Probiotic Biosurfactant Multi-Task keeps on working to continue to lower ATP levels on the surfaces to which it is applied, as noted in the following example:

### Example of Ongoing Cleaning

Before Cleaning with Multi-Task (12:27 pm)	Immediately After Cleaning with Multi-Task (12:29 pm)	36 Minutes After Cleaning with Multi-Task (1:05 pm)
		

This test was conducted on the desktop surface in front of the keyboard to a computer work station in a school's M&O depot, used by all M&O personnel to retrieve new work orders and record completed ones.

The work station was in constant use between the immediate post cleaning reading (25) and the next reading 36 minutes later.

As seen in this example, ATP levels continued to decline after cleaning, highlighting the ongoing residual cleaning action of Multi-Task Probiotic Cleaner.

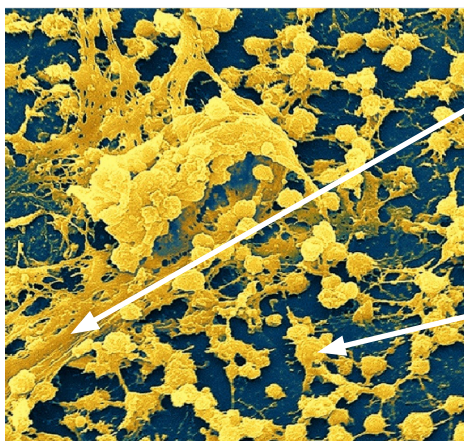
Conventional chemistry cleaning agents provide no such ongoing, residual cleaning action.

### Biofilm and ATP

Why did the USDA and ISSA choose ATP as a measure for clean? Well it comes down to the relationship between ATP levels and biofilm.

Biofilms are made up of any group of microorganisms in which cells stick to each other on a surface. These adherent cells are frequently embedded within a self-produced matrix of extracellular polymeric substance (EPS), which is a polysaccharide.

- It's a protective layer; like a layer of Saran Wrap that bacteria produce to protect themselves.
- When disinfectants are applied, they clean the top of this Saran Wrap type biofilm, but fail to penetrate it.
- Consequently, disinfectants do not get to the pathogen bacteria imbedded in biofilm layers.



#### Biofilm Binding Matrix

Extracellular Polymeric Substances (EPS)  
(exopolysaccharides, glycoproteins,  
glycolipids, proteins ...and more)

#### Micro-organisms

(bacteria, archaea, fungi, algae, viruses)

Microorganisms may be protected from disinfectants by production of thick masses of cells and extracellular materials, or biofilms<sup>429-435</sup>. Biofilms are microbial communities that are tightly attached to surfaces and cannot be easily removed.

Once these masses form, microbes within them can be resistant to disinfectants by multiple mechanisms, including physical characteristics of older biofilms, genotypic variation of the bacteria, microbial production of neutralizing enzymes, and physiologic gradients within the biofilm (e.g., pH).

Bacteria within biofilms are up to 1,000 times more resistant to antimicrobials than are the same bacteria in suspension<sup>436</sup><sup>2</sup>

Reductions in ATP levels are taken to indicate a reduced probability of the presence of surface biofilm:

### ATP Model: Hygienia System SURE Plus

ATP Luminescence Level (RLUs)	Cleaning Effectiveness	ATP Reading (RLUs)	Probability of Pathogenic Biofilm
600 or Above	Ineffective	>300	99.90%
300 to 599	Needs Major Improvement	200	99.00%
80 to 299	Needs Minor Improvement	100	50%
30 to 79	Effective	30	2%
29 or Below	Highly Effective	10	0%
		0	0.00%

Continuing to lower ATP indicates an ongoing reduction in surface biofilm, which improves the efficacy of disinfectants used in Step 2.

### How do Z BioScience Probiotic Biosurfactant Cleaners impact viruses?

- Low ATP levels, (such as 29 or less using the calibrated scale for the Hygienia System SURE Plus meter with UltraSnap swabs in food processing facilities), are indicative of a low probability of the presence of a pathogen biofilm.
- Viruses need a biofilm to exist on surfaces in the absence of a living host.
- Cleaning surfaces in a manner that lowers ATP levels to 29 or less, and maintains those low ATP levels for extended periods, is important as it indicates a low probability of the presence of a biofilm that can support a virus on surfaces.
- Z BioScience’s Probiotic Biosurfactant cleaners have been consistently shown to lower ATP levels further, and maintain those lower ATP levels for longer than conventional chemical disinfectants, and so the lower the probability of viruses being present on such surfaces.

### About Z BioScience’s Probiotic Multi-Task

#### How It Works:

Multi-Task Probiotic Cleaner represents a technological advancement in cleaning by introducing a biological component in the form of safe, beneficial US FDA ‘GRAS’ (Generally Regarded As Safe) schedule listed probiotic bacteria, to enhance the traditional combination of physics and chemistry.

<sup>2</sup> <https://www.cdc.gov/infectioncontrol/guidelines/disinfection/efficacy.html>

As such Multi-Task Probiotic Cleaner represents a biology-based solution to address the biology-based problem of pathogens, (bacteria, fungi and viruses).

The underlying scientific principle as to how this works is the 'Law of Competitive Exclusion':

*Where two or more species, (probiotic and pathogens), compete for the same resource, (food), one will prevail, and the other(s) will be displaced.*

Multi-Task Probiotic Cleaner delivers an abundance of safe, beneficial probiotic bacteria to the surface that overwhelm the pathogens, depriving them of access to the available microscopic food sources, resulting in the pathogens starving.

Furthermore,

- As probiotic bacteria eat, they produce biosurfactants.
- These biosurfactants keep breaking down microscopic surface contaminants, releasing more protein for the probiotics to eat.
- The probiotics eat the new protein and produce more biosurfactants.
- This is an ongoing cleaning cycle that continues until the food source on the surface is exhausted.
- In this process the dominant presence of probiotics starves out pathogens.

This process of displacing pathogens through bio-engineering surfaces so they are dominated by safe, beneficial probiotics, is very different methodology to conventional chemistry solutions.

As such Multi-Task Probiotic Cleaner is not a pesticide, biocide or virucide.

Rather, the presence of the probiotics effectively makes the surfaces to which they are applied hostile / inhospitable to unwanted pathogens such as bacteria, viruses and fungi. The pathogens are biologically displaced.

Lowering ATP levels is evidence of the efficacy of this process.

## **Product Safety – Z BioScience Probiotic Biosurfactant Cleaners**

All of Z BioScience's Probiotic Biosurfactant Cleaners comprise two core constituents:

- US EPA 'Safer Choice' delivery surfactants
- US FDA 'GRAS' (Generally Regarded As Safe') schedule listed probiotic bacteria.

They are also:

- pH neutral
- Safe for application in presence of people and animals
- Compliant with California Prop 65
- Safe for application on all moisture tolerant surfaces
- Environmentally safe and suitable for disposal into municipal waste water systems

## Use of Z BioScience's Multi-Task Probiotic Cleaner:

### Multi-Task Probiotic Cleaner - Mixing Instructions:

- **SHAKE PRODUCT CONTAINER WELL IMMEDIATELY BEFORE DILUTING.**
- **DILUTED PRODUCT TO BE USED WITHIN 5 DAYS**
- Best when diluted with warm potable water up to 120°F
- Dilute as follows using potable city tap water:
  - All Purpose General Cleaning – Dilute 2oz / gallon (1:64)

**DO NOT USE CONTAINERS THAT HAVE BEEN USED  
WITH ANY OTHER CLEANING OR DISINFECTANT PRODUCTS**

### Multi-Task Probiotic Cleaner - Applications:

- 'Spray and Wipe' protocols incorporating microfiber clothes; wipe before product dries.
- 'Mop & Bucket' floor cleaning protocols
- 'Pressure Washers' with warm potable water (not in excess of 140°F)
- Suitable for use with commercial & industrial Zamboni (and other like) floor cleaning equipment
- Suitable for application as a foam.

### Multi-Task Probiotic Cleaner - Storage & Handling:

- Store / keep product away from direct sunlight.
- Do not allow product to freeze;
- Best stored between 36°F and 120°F. .

## Step 2 - Disinfect

Disinfection agent, (bleach, quat, oxidizer).

Such agents should be applied in full accordance with product manufacturer's instructions. This includes:

- Observing minimum dwell times
- Maintain the disinfectant in a wet state for the full duration of the designated dwell time.

Proper Personal Protection Equipment (PPE) as specified by the manufacturer, and related regulatory agencies, should be used by applicators when administering disinfection products.

## Step 3 - Providing Ongoing Protection Z BioScience Enviro Mist Probiotic Microflora Spray

Once disinfection agents have been applied, and dried out on the surface, they offer no ongoing, residual surface cleaning or protection.



Furthermore, because disinfection products are non-specific in their process of microbiological elimination, (they seek to 'kill' both the much needed, beneficial bacteria that are necessary to support occupant wellness, along with the unwanted, potentially harmful pathogen bacteria), they create a microbiological vacuum on the surfaces to which they are applied.

As such these surfaces are now subject to rapid re-habitation by planktonic pathogens, and or re-colonization by surviving pathogens not affected by the disinfection process; (see supplementary paper on Disinfectants to fully appreciate their limitations).

The solution is to bioengineer these surfaces to ensure their ongoing safety in terms of being supportive of occupant safety, through re-populating them with safe, beneficial US FDA 'GRAS' schedule listed probiotic bacteria.

This is best achieved by applying Z BioScience's Enviro Mist Probiotic Microflora Spray.

This is a Ready-to-Use product that is best applied via an Ultra-Low Volume (ULV) Cold Fogger that delivers a droplet size of 10 microns to 20 microns.

Enviro Mist, when applied to areas in this manner, will populate the cleaned and disinfected surfaces with an abundance of safe, beneficial probiotic bacteria, the ongoing presence of which will provide:

- An ongoing cleaning process at the microscopic level;
- Make these surfaces hostile / in-hospitable to the rapid re-habitation and or re-colonization by planktonic pathogens.

#### **Enviro Mist - Product Instructions:**

- **SHAKE PRODUCT CONTAINER WELL BEFORE APPLYING.**
- Product is "Ready to Use" – No dilution required (except where otherwise stated).

**DO NOT USE CONTAINERS THAT HAVE BEEN USED WITH ANY OTHER CHEMICAL PRODUCTS**

#### **Enviro Mist - Application Equipment:**

- Hand Held or Back Pack ULV fogging equipment (droplet range 10 to 20 microns optimal)
- Suggested brand (though not an inclusive list):
  - Longray CarryAll ULV Fogger; B&G Flogger

#### **Enviro Mist - Application Rates – ULV Fogger Protocol**

- Applied at a 10 to 20 microns droplet size 1 (one) gallon should be sufficient to fog up to 8,000 (eight thousand) square foot space to 10,000 (ten thousand) square feet.

#### **Enviro Mist - Application Protocols**

- Use back pack or hand held ULV fogger noted above.
- Objective is to apply a microscopic layer of protective, safe, healthy probiotic bacteria
- Direct misted product onto all water tolerant surfaces.
- Direct mist onto fabric of curtains, over furniture (couches, chairs), surface coverings (bedding, table clothes and mats), carpet, rugs, counter tops, etc.
- **IMPORTANT** – Best not to saturate surfaces. It is not necessary to visually see moisture on the surfaces if you are sure they have been covered.

## CONCLUSION

The CDC's Disinfection Guidelines mandate a 2 Step process:

- Step 1 – Clean surfaces thoroughly with Z BioScience Multi-Task Probiotic Cleaner to remove soils (organic and inorganic).
- Step 2 – Apply disinfectant according to label instructions after cleaning

HOWEVER, the biological constituents (probiotics) included in Z BioScience's products for Step 1 and Step 3 of its protocol deliver unique, ongoing surface protection that the CDC Chemical Disinfection protocol cannot.

- Step 1 – Cleaning surfaces with Z BioScience Multi-Task Probiotic Cleaner delivers superior surface cleaning and preparation to maximize the efficacy of disinfectants.
- Step 3 – Fogging with Z BioScience's Enviro Mist Probiotic Microflora Spray provides ongoing surface protection once disinfectants stop working within minutes of being applied.

### Z BioScience's CLEAN, DISINFECT, and PROTECT Protocol

#### Step 1 – Clean Surfaces with Multi-Task:

- Use Z BioScience's Probiotic Biosurfactant Multi-Task Cleaner to replace current cleaning agents being used.
  - Recommend use of new trigger spray bottles for use with Multi-Task Probiotic Cleaner to avoid chemistry residue from existing products that could compromise the probiotics in Multi-Task.
  - Recommend new microfiber cloths and flat mops to avoid chemistry residue from existing products that could compromise the probiotics in Multi-Task.
  - Thoroughly rinse out all mop buckets, and product holding / reservoir tanks on equipment such as auto scrubbers, pressure washers and the like so as to remove all residue of prior chemistry-only products.

#### Step 2 – Disinfection:

- Apply chosen Disinfectant in accordance with manufacturer's instructions, especially maintaining disinfectant in a 'wet' state for duration of the mandated dwell time.

#### Step 3 – Ongoing Protection with Enviro Mist:

- After Cleaning and Disinfecting steps, surfaces are vulnerable to rapid re-population by unwanted, harmful pathogens, so need an ongoing protective barrier.
- Fogging with with Z BioScience's Enviro Mist Probiotic Microflora Spray provides a protective barrier of safe, beneficial US FDA 'GRAS' schedule probiotics that make surfaces in-hospitable / hostile to pathogens.

Recommend the ongoing use of both  
Multi-Task Probiotic Cleaner and Enviro Mist Probiotic Microflora Spray  
to ensure continued high levels of surface hygiene and protection.



[www.zbioscience.com](http://www.zbioscience.com)

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