Bulk Sterilization Techniques for Eradicating Coronavirus in Schools & Workplaces

5 methods that help "kill" Covid-19 viruses found in the workplace and school environments, as well as transportation interiors.

Formaspace manufactured this custom mobile unit for a hospital in Florida. It features non-porous epoxy work surfaces that make it easy to sanitize.

AUSTIN, TEXAS, UNITED STATES, October 12, 2020 /EINPresswire.com/ -- As Coronavirus lockdown regulations begin to ease, workers around the country are slowly beginning to return to their places of work – but not without a high degree of apprehension.

Each time commuters get ready to board a train, bus, or airplane, they asked themselves, "Has this seat been sterilized for coronavirus?" These same types of questions weigh on the minds of workers/users returning to office buildings, factories, laboratories, or educational institutions: is the elevator clean? Are the bathrooms safe to use? Is my desk or work surface adequately sterilized?

OSHA and the CDC recently issued updated guidelines that outline key steps that facility managers need to follow to help create a safe and healthy work or school environment.

As it turns out, two of the most important safety guidelines are literally in the hands of workers (or students) themselves. They are:

- frequent handwashing throughout the day and avoiding touching your face
- wearing a mask, which protects others from exposure to your germs and viruses

But beyond these two very important recommendations, what can facility managers do to create a cleaner, safer sterilized environment?

We take a look at five different large-scale cleaning methods that are being used around the world to eradicate the Covid-19 virus from built environments and enclosed interior spaces.

01. Chemically-Based Coronavirus Sanitizing Systems

In our earlier articles about the pandemic, we've written extensively about laboratory research looking at the telltale "spikes" surrounding the Coronavirus. Understanding how these spikes enter the human body (by infecting ACE-2 Receptors) is crucial for developing successful clinical therapies or even an effective Covid-19 vaccine.

However, for sterilizing a built environment, we need to shift gears and focus on the membrane envelope that surrounds each individual Covid-19 virus particle.

	EPOXY RESIN	PHENOLIC RESIN	COLORCORE PHENOLIC	STAINLESS STEEL	HDPE
LAB APPLICATION	HEAVY DUTY	MODERATE	MODERATE	MODERATE TO HEAVY DUTY	LIGHT DUTY TO MODERATE
CORROSIVE CHEMICAL RESISTANCE	HIGH	MODERATE	MODERATE	MODERATE	MODERATE
CARBON-BASED CHEMICAL RESISTANCE	HIGH	MODERATE	MODERATE	HIGH	MODERATE
TEMPERATURE RESISTANCE	HIGH	MODERATE	MODERATE TO HIGH	HIGH	POOR
LEAD TIME	LONG	MODERATE	LONGER THAN OTHERS	LONG	QUICK
MATERIAL	SILICA AND RESIN BASED	PAPER & RESIN BASED	PAPER & RESIN BASED	STAINLESS STEEL	PLASTIC BASED
PRICE	••••	•••	••••	•••••	••
SAMPLE ENVIRONMENTS	CHEMICAL, INDUSTRIAL	MEDICAL, CLINICAL, BIO-SCIENCE	MEDICAL, CLINICAL, BIO-SCIENCE	FOOD SERVICE, MEDICAL, CLINICAL	MARINE BIOLOGY, FOOD & BEVERAGE
	READ MORE	READ MORE	READ MORE	READ MORE	READ MORE

Formaspace offers a wide range of work surface materials designed to withstand heavy-duty use and resist chemical exposure. Your Formaspace Design Consultant can help you specify the best solution for your needs.

Formaspace can also manufacture easy to clean custom tables for use in cafes, bars, and restaurants. Working with partner TWO Furnish, Formaspace built industrial styled furniture for Twitter's new tech hub in Ponce City Market.

Despite their small size (averaging 0.125 microns in diameter), each of these individual virus particles is encapsulated in a relatively fragile lipid membrane, which you can think of as an infinitesimally small drop of oil (or fat, or grease, if you prefer).

That's actually good news. It's relatively easy to break the Covid-19 membrane apart (rendering it effectively "killed") by vigorous handwashing using ordinary soap and water.

Other detergents and chemicals capable of breaking organisms apart (such as alcohol or bleach-based products) are also effective. Quaternary-based disinfectants (widely used in hospitals) are an excellent choice as well, as they are proven to kill pathogens that are similar to the Covid-19 virus.

Who Uses Chemically-Based Sanitizing Systems?

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> *Formaspace*

Practically speaking, nearly every facility team around the world is using some form of chemical treatment (including bleach, alcohol, detergent, and quaternary-based disinfectants) to clean potential coronavirus particles from high touch surfaces.

Some businesses, such as hotels sanitizing guest rooms, are spraying disinfectant over wide areas using fogging machines, fumigation sprayers, or electrostatic spraying systems.

However, the EPA cannot recommend these methods as they have not been able to certify that applying the disinfectants in this manner is effective in eradicating the Covid-19 virus.

What Chemical Products Are Used?

The EPA maintains a list of currently approved chemicals, with disinfection instructions and contact times. The CDC has also prepared specific instructions for cleaning and disinfecting facilities where exposure to the Covid-19 virus is suspected.

What Are The Advantages Of Using Chemically-Based Sanitizing Systems?

Chemically-based cleaning methods approved for sterilizing non-porous surfaces (if done in accordance with CDC and EPA recommendations) are a time-tested and well-understood approach used by cleaning staff worldwide.

Most of the cleaning products are relatively safe (although the standard cautions of avoiding mixing chemicals such as bleach with ammonia apply), but these risks are well understood and not specific to the Covid-19 virus.

The list of approved EPA disinfectant products includes hospital-grade quaternary disinfectant cleaners (active ingredient Quaternary ammonium) that have been shown to kill other pathogens, including HIV, Norovirus, and MRSA.

What Are The Disadvantages Of Using Chemically-Based Sanitizing Systems?

Without an approved method for bulk sterilization (using foggers or sprayers, etc.), the chemically-based sanitation approach remains quite labor-intensive: it takes time for cleaners to apply disinfecting solutions to individual surfaces, wait an appropriate amount of contact time, and then wipe them down afterward.

Many chemically-based systems create fumes and must be used with adequate ventilation. This

poses a problem when cleaning the interior of an aircraft, for example, because the long narrow interiors are difficult to ventilate.

While chemical disinfectants do a good job sterilizing hard services (such as stainless steel or laminate worksurfaces, metal door handles, or ceramic toilets), there are fewer products available to clean non-porous surfaces (such as fabric, leather, or upholstery materials).

To find suitable products for cleaning porous materials, search the EPA's recommended product list for the term "(P)" which indicates porous surfaces; included in this list are quaternary ammonium, hydrogen peroxide, and peroxyacetic acid-based products.

Unfortunately, it appears that treating cloth by laundering is the best cleaning method, but this is not practical in many cases.

Also, some cleaning products can discolor plastics. Test an inconspicuous area first before using it.

02. Ozone-Based Coronavirus Sanitizing Systems

Ozone, which is probably most commonly known as a smog inducing air pollutant, is also a powerful oxidant is used to break apart grease and sterilize clothing in commercial laundries, prevent mold growth on citrus fruit stored in commercial warehouses, and to eliminate the smell of smoke from buildings damaged by fire.

Unfortunately, the concentration of ozone needed to kill coronaviruses inside a building far exceeds the levels of safe human exposure (which is why the EPA specifically recommends against its use for this purpose).

The risk to health is why companies that do use ozone systems (for mold and smoke damage mitigation, for example) have to take extraordinary safety precautions, such as preventing people (or pets) from entering areas undergoing treatment. Ventilating interiors after an application can take hours (or days) before it's safe for people to be let back in.

Given that coronavirus particles eventually "die" on their own (in a matter of hours and days), in nearly all cases, it makes more economic sense just to close a building and "wait" for the virus to be eliminated on its own, rather than go through the effort of conducting an ozone treatment program.

Who Uses Ozone-Based Sanitizing Systems?

Laundry facilities at athletic clubs and assisted living facilities are typical customers for commercial laundry systems using ozone, due to its ability to sterilize laundry and eliminate odors.

Disaster mitigation services, such as companies treating buildings for smoke damage, often employ ozone generators to flood interior spaces with high concentrations of ozone to remove the smell of smoke and to kill mold spores.

Similar systems (commonly known as “smoke eaters”), which operate at much lower ozone concentrations, are used by bars and restaurants to reduce odors generated by cigarettes or cigars.

What Ozone-Generating Products Are Used?

Ozone generating systems use electricity to generate gas. Some designs produce ozone that is dissolved directly into water (for commercial laundries, for example), while others are optimized to release ozone gas directly into the air.

What Are The Advantages Of Using Ozone-Based Sanitizing Systems?

At high concentrations, ozone gas can sterilize surfaces as well as break down grease, kill mold spores, and eliminate odors.

What Are The Disadvantages Of Using Ozone-Based Sanitizing Systems?

Breathing ozone at high concentrations can damage the lungs, with potentially lethal results.

Ozone detection meters are a must-have for use with all ozone applications.

While experienced operators are familiar with the “smell” of ozone, most people will first notice a sudden headache followed by possible fainting or a burning sensation in the lungs.

Because ozone damages plastic and rubber items, systems that use ozone regularly, such as commercial laundries, need to be inspected often for leaky gaskets and hoses.

03. UV-Light-Based Coronavirus Sanitizing Systems

Hospitals concerned about MSRA and other difficult to control pathogens have been investing in UV-light based sanitizing systems in recent years to sterilize patient rooms, surgical theaters, even hallways, and waiting rooms.

Read more...

Julia Solodovnikova
Formaspace
+1 800-251-1505

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