

USE OF ELECTROSTATIC SPRAYERS (FOGGERS) WITH EPA-REGISTERED DISINFECTANTS IN RESPONSE TO COVID-19

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BACKGROUND

Coronavirus Disease 2019 (COVID-19) is a respiratory disease caused by the SARS-CoV-2 virus that spreads from person-to-person through respiratory tract expulsion (e.g. sneezing, coughing) of droplets from an infected person to an unexpected person. A secondary risk exists for infection when people touch contaminated surfaces and then touch their mouths, noses, and/or eyes. Effective surface disinfection helps to reduce the risk of disease transmission by removing the virus from the environment.

U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA)-REGISTERED DISINFECTION PRODUCTS

The EPA maintains a list of surface disinfectant products registered to kill the virus. Refer to List N: Disinfectants for Use Against SARS-CoV-2.

(<https://www.epa.gov/pesticide-registration/list-n-disinfectants-use-against-sars-cov-2>)

The products on this list have not been tested against SARS-CoV-2 but have either demonstrated efficacy against a harder-to-kill virus, qualified for the emerging viral pathogens claim, or demonstrated efficacy against another human coronavirus.

A product approved by the EPA will have an EPA registration number that is on List N. The product label will display the number as “EPA Reg. No.” Disinfection products may be marketed and sold under different brand names but share the same EPA registration number. Distributor products may use different brand names for the same approved product. You can identify a distributor product by its three-part EPA Reg No. The first two parts match the primary product numbers. The third set of numbers represents the distributor identification. If you see a product on list N with two sets of numbers and your product has those plus a third set, it is an EPA-registered product.

ENHANCED DISINFECTION USING PORTABLE ELECTROSTATIC SPRAYERS (FOGGERS)

Areas where COVID-19-infected patients were present such as large rooms, latrines, barracks, cafeterias, gyms, buses, and medical facility waiting rooms can be difficult, labor intensive, and time consuming to disinfect. Portable electrostatic sprayers (foggers) can safely, effectively, and quickly apply EPA-approved disinfectants to surfaces of all types in large and small areas including those in hard-to-reach places.

The electrostatic sprayer positively charges the disinfectant as it passes through the sprayer nozzle. This generates positively charged disinfectant droplets that seek out negatively charged surfaces. The positively charged disinfectant droplets stick to the surfaces in a uniform coating that fully covers the targeted surfaces. Over-application is reduced because the charged particles will seek out an exposed surface area instead of adhering to each other. The droplets are applied wet and left to dry, affording the required disinfectant contact time. The recommended disinfection ingredient for this process is a product that uses quaternary ammonium chloride because it is naturally positively charged and more chemically stable for the process. However, hydrogen-peroxide, hypochlorous acid, and bleach-based products can be used in the devices.

Approved for public release; distribution unlimited

Use of trademarked name(s) does not imply endorsement by the U.S. Army but is intended only to assist in identification of a specific product.

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SYSTEM SELECTION

When selecting an electrostatic sprayer system, ensure the electrostatic sprayer can be used with a chemical product from the EPA List N, March 2020. Look for disinfection products that indicate they can be used for fogging and are compatible with the selected sprayer. When disinfecting areas/vehicles with electronic equipment: (1) select chemical products with neutral or close to neutral pH concentrations (after dilution per the manufacturer's guidance) to lessen the potential for corrosion or damage to the equipment or (2) choose products indicating they are safe for use on electronics. Products that state "No Wipe" indicate no residues remain after the manufacturer-recommended contact time. Products that state "Wipe" indicate some residuals may remain that require wiping from high-touch, food preparation, and hygiene surfaces. Sprayer systems are available as rolling carts, backpacks, and handheld devices. Handheld and backpack models can be heavy when filled with liquids. Corded devices provide unlimited power and droplet charging, which result in consistent performance; however, the cord can pose an obstacle to movement. Battery-powered units are highly mobile but must be recharged often to ensure complete charging of the disinfectant particles.

FREQUENCY OF DISINFECTION

This disinfection technique can be performed routinely as needed but must be conducted once the area/vehicle is vacated. For example, if you are transporting potentially infected patients on a bus and need to transport additional bus loads, you can disinfect the bus after every transport if needed. You could disinfect a potentially exposed barracks building or gym daily after closing time if needed. The time between disinfection and reuse of the area/vehicle is the required dwell/contact time (1–10 minutes on average) and time required to wipe the surfaces after fogging.

GENERAL PROCEDURES

- Obtain manufacturer-recommended personal protective equipment (PPE) for the disinfectant product chosen.
- If dilution of the stock chemical is required, prepare fresh disinfection solutions daily.
- Vacate the area to be cleaned of all personnel except the people conducting the cleaning.
- Don appropriate PPE for manual surface cleaning tasks.
- Enter the area, remove all trash, debris, and so forth, and dispose as general solid waste.
- Clean soiled surface areas with an approved cleaning product to remove dirt, food wastes, stains, body fluids, and so forth.
- Remove all paper products from the area.
- Close windows, doors, and other openings in the area.
- Don appropriate PPE for disinfectant fogging.
- Apply the disinfectant fog to all surfaces in the area, except ceilings and surfaces not exposed to droplet contamination. Follow the manufacturer's operating guidance for the sprayer to ensure the fog has time to adequately wet the surfaces.
- Depart the area and allow the manufacturer-recommended dwell/contact time for the surfaces to dry (most fall between 1–10 minutes).
- Remove PPE used for disinfection and wash hands.

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- If the product recommends wiping or doesn't provide any recommendation about wiping, Don PPE (gloves), enter the area, and wipe all high-contact, food, and/or hygiene surfaces (latrine counter tops) to remove any residual disinfectant. Use clean wipes for this process.
- Open the area doors/windows and/or activate the heating, ventilation, and air-conditioning system to provide ventilation and to clear any remaining disinfectant odor.

EXAMPLES

Examples provided do not indicate an endorsement of a product or service by the U.S. Army.

- Clorox offers a system called the Clorox® Total 360® System at: <https://www.cloroxpro.com/products/clorox/total-360/>
- Delta Air Lines® is using the Protec 4 battery sprayer as part of the evaclean™ Protexus Disinfection System: <https://evaclean.com/products/protexus-cordless-electrostatic-sprayers>
<https://news.delta.com/coronavirus-update-deltas-cleaning-measures-protect-public-health-and-safety-check-arrival>
- Victory Innovations® system at: <https://victorycomplete.com/>

LOW-VOLUME FOGGERS

Low-volume fogging devices are also available on the market. These devices do not charge the particles to provide uniform application to the target surface. Instead, the device operator must display technical expertise and knowledge to sufficiently wet the surfaces without over saturation. The devices work with all types of disinfection solutions and could be an alternative for qualified technicians since they are readily available on the market.

USE OF CONTRACTOR SERVICES

Industrial cleaning and restoration contractors offer services using electrostatic systems and/or low-volume fogging systems if purchase of the equipment is of concern or unavailable due to limited supply. Secure contract services in advance of need on a contingency basis.

DO NOT RE-PURPOSE INSECTICIDE/HERBICIDE APPLICATION EQUIPMENT

Select a new device that is specifically designed for disinfectant application with use of EPA-registered disinfectants, and choose a device that is compatible with the selected disinfectant chemical. *Do not re-purpose any equipment previously used for pesticide/herbicide applications.* Electrostatic sprayers and low-volume foggers previously used for insecticide/herbicide applications are regulated under EPA Federal Insecticide, Fungicide, and Rodenticide Act regulations and are considered contaminated.

REFERENCES

Centers for Disease Control and Prevention (CDC), Coronavirus Disease 2019 (COVID-19), Healthcare Infection Prevention and Control FAQs for COVID-19. Page last reviewed March 24, 2020: <https://www.cdc.gov/coronavirus/2019-ncov/infection-control/infection-prevention-control-faq.html>

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CDC, COVID-19, Cleaning and Disinfecting Your Facility, Page last reviewed March 27, 2020: <https://www.cdc.gov/coronavirus/2019-ncov/prepare/disinfecting-building-facility.html>

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