

Guidelines for Safer COVID-19 Cleaning and Disinfection

Effective and responsible cleaning and disinfecting practices for occupant health and safety

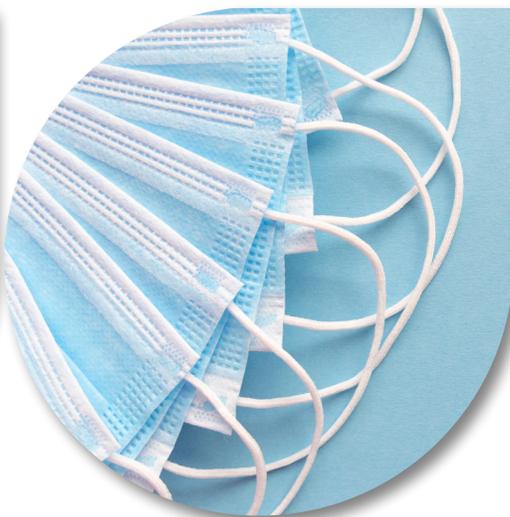


Updated September 2024

Introduction

COVID-19 has transformed the indoor environments of offices, public facilities, and other buildings across the world.

This document, intended for facility, property and housekeeping managers, provides actionable guidelines for the safe and effective cleaning and disinfection of occupied spaces. These five best practices are based on the latest scientific understanding of the particular characteristics of the COVID-19 virus. They also reflect Green Seal's expertise in setting science-based standards for high-performance cleaning products, principles, and practices that reduce unnecessary use of hazardous chemicals and promote safer and healthier indoor air.



Understanding COVID-19

SARS-CoV-2 is the name of the virus that causes Coronavirus Disease 2019, or COVID-19. The primary way people contract COVID-19 is through exposure to respiratory droplets carrying the virus, via one of three exposure pathways:

1. Inhalation via fine respiratory droplets and aerosolized particles.
2. Deposition of fine respiratory droplets and particles on mucous membranes.
3. Touching mucous membranes with contaminated hands, typically from coming into direct contact with virus-containing respiratory fluids.

CDC has stated that the risk of indirect surface to person transmission is generally low.

Vaccination is now the most powerful tool against slowing transmission. Frequent screening testing is also helpful. Even with the new understanding of this virus, the other best methods for limiting transmission remain the same: physical distancing, the correct use of masks, and careful hand hygiene.

COVID-19 viruses are surrounded by a protective lipid envelope, which can be easily broken apart by hand soap, alcohol hand sanitizer, and many types of disinfectant products.¹ Although a COVID-19 virus-free environment cannot be guaranteed, the actions recommended in these guidelines can reduce the risk of transmission.

Planning for Workplace Reopening

Property owners, operators, and managers should assemble teams with appropriate technical expertise to create a written plan for workplace reopening that incorporates the cleaning and disinfecting guidance in this document. Cleaning services providers are an essential part of the planning team because they will be responsible for implementing many of the measures. The plan should conform to any federal, state and local requirements for workplace reopening. Public health agencies and cleaning product suppliers may have information to help ensure that the cleaning and disinfecting portion of the plan reflect best practices, current technologies, and regulatory compliance.

This Green Seal document summarizes five cleaning and disinfecting best practices to help prevent the spread of COVID-19:

1	2	3	4	5
Create a cleaning and disinfecting plan.	Ensure that cleaning personnel are properly trained.	Maintain sustainability and healthy indoor air.	Communicate the cleaning and disinfecting plan.	Provide safer working conditions.

These evidence-based cleaning and disinfecting practices build on “Reopening Guidance for Cleaning and Disinfecting Public Spaces, Workplaces, Businesses, Schools, and Homes,” developed by the Centers for Disease Control and Prevention (CDC) and the Environmental Protection Agency (EPA).² These practices also **incorporate the LEED® requirements for earning [Pilot Credit - Safety First: Cleaning and Disinfecting Your Space](#)**.³ (LEED) Practices that contribute to the LEED Pilot Credit are noted in blue text throughout this document. These guidelines also align with the requirements in the features related to cleaning products, practices, and protocols in WELL v2 and the recently announced WELL Health Safety Rating for Facilities Management and Operations.

¹ <https://cen.acs.org/biological-chemistry/infectious-disease/How-we-know-disinfectants-should-kill-the-COVID-19-coronavirus/98/web/2020/03>

² <https://www.cdc.gov/coronavirus/2019-ncov/community/reopen-guidance.html>

³ <https://www.usgbc.org/credits/safety-first-137-v4.1>

1. Create a Cleaning and Disinfecting Plan

Indoors

Whereas Green Seal's cleaning services standard (GS-42) recommends sanitizing restrooms and disinfecting break rooms and dining rooms during normal operations, the current evidence-based approach recommends increased disinfecting practices while COVID-19 is ongoing.



When and where to routinely disinfect

Routinely clean*:	→ High-touch surfaces such as doorknobs, elevator buttons and light switches.
Close for as long as possible, then clean and disinfect:	→ Areas immediately occupied by a person suspected of infection.
Clean, but don't disinfect:	→ Outdoor areas.

**In areas with low vaccination rates, high transmission rates, infrequent use of other prevention measures, and vulnerable populations, more frequent cleaning and routine disinfection of high touch areas may be considered.*

The COVID-19 response team should prepare plans for three cleaning and disinfecting scenarios for indoor spaces:

- A** Workplace reopening: If a building had reduced operations or was temporarily shut down, take the following steps before increased occupancy:
- Assess the building for mold and excess moisture to determine whether any remediation is needed. Follow CDC's recommendations for flushing the water system and individual water fixtures to remove stagnant water and potential pathogens and pollutants that may have built up during the shutdown. According to CDC, reductions in normal water use can lead to mold and Legionella, as well as other hazards. ⁴

⁴ <https://www.cdc.gov/coronavirus/2019-ncov/php/building-water-system.html>

- Run any inactive HVAC systems for 48 to 72 hours and determine whether any filters need to be cleaned or replaced.
- Conduct routine cleaning and disinfecting if the building has been unoccupied for at least seven days, following the steps in scenario B. This is a CDC recommendation.

If anyone was in the building seven days prior to workplace reopening, conduct enhanced cleaning and disinfecting throughout the building, following the steps in scenario C.

B Routine cleaning and disinfecting: As more people return to the workplace, routine cleaning of areas once a day should be sufficient.

- **Refer to CDC’s decision tool to create a detailed list of high-touch areas to be disinfected.⁵ (LEED)** In areas with low vaccination rates, high transmission rates, infrequent use of other prevention measures, and vulnerable populations, more frequent cleaning and routine disinfection of high touch areas may be considered. Refer to CDC’s decision tool to create a detailed list of high-touch areas to be cleaned. For example, the building’s entry door will be handled more than a classroom door that is kept open all day. Other likely high-touch items include elevator buttons, restroom surfaces, phones, and stair railings.
- Determine the frequency of cleaning and disinfection. High-touch surfaces should be cleaned at least once a day, so scheduling around an average number of unique touches may be a better approach than scheduling based on time alone. For example, an office entrance and lobby may need to be cleaned more frequently at the times when occupants are entering or exiting the building (morning, lunchtime, close of business).
- **Implement a policy to regularly verify cleaning and disinfecting efficacy, beyond a visual inspection (LEED),** for continuous improvement in cleaning and disinfecting practices.⁶ One method to quantify cleanliness is ATP monitoring, which measures the amount of residual organic material. Although ATP monitoring cannot detect the COVID-19 virus, it can detect respiratory droplets or fecal matter that may be infected. Another option that uses cleanliness as a proxy for disinfection efficacy is to apply fluorescent markers to high touch surfaces prior to cleaning and to use ultraviolet light after cleaning and disinfecting to identify any missed spots.
- Consider how cleaning schedules may be affected by COVID-19 policies. Nighttime cleaning services alone may no longer be enough, if it is determined that targeted cleaning and disinfecting is needed during opening hours.

C Following a suspected or confirmed COVID-19 case: Cleaning and disinfecting should be enhanced if someone with COVID-19 was in the building. Even if the case is only suspected, do not wait for the infection to be confirmed: the current lag between testing and results creates a risk that the virus will spread. CDC recommends the following steps for enhanced cleaning and disinfecting:

1. Immediately close off areas visited by the ill persons, including offices, restrooms, and common areas.
2. Open windows and doors where possible and safe, and operate fans (including heating, ventilating, and air-conditioning fan systems) to increase the ventilation rate in affected areas.

⁵ <https://www.cdc.gov/coronavirus/2019-ncov/community/cleaning-disinfecting-decision-tool.html>

⁶ <https://www.cdc.gov/hai/toolkits/appendices-evaluating-enviro-cleaning.html>

3. Leave the spaces occupied by the ill persons for as long as possible, up to 24 hours, to reduce the viral load before allowing cleaning personnel to enter.
4. Clean and disinfect all areas used by the ill persons. Vacuum the space if needed, using a high efficiency particulate air (HEPA) filter.

Outdoors

CDC recommends routine cleaning of outdoor spaces but discourages widespread spraying of disinfectants in outdoor areas, such as on wooden surfaces (benches, tables), groundcovers (mulch), and sidewalks or roads.



2. Ensure that Cleaning Personnel are Properly Trained

In addition to having the proper products and tools, proper training is essential for safe and effective cleaning and disinfecting. Confirm that service provider partners are implementing in-person training and providing materials in appropriate languages for cleaning personnel prior to workplace reopening.

Enhance training for cleaning staff

All cleaning personnel should receive in-person training in appropriate languages on:

- Safe and effective handling and use of products
- Use and maintenance of cleaning equipment
- Preventing ergonomic injuries
- Proper cleaning procedures
- Use of PPE, including how to avoid cross-contamination
- Recognizing COVID-19 symptoms

Typical training for cleaning and disinfecting should cover:

- **Safe handling of all cleaning and disinfecting products, effective cleaning procedures, and the use and maintenance of cleaning equipment. (LEED)** Cleaning personnel who know how to correctly use products and equipment are more efficient and effective at cleaning and disinfecting, and also reduce product waste and chemical exposure.
- **Standard safety precautions, such as reducing and preventing ergonomic injuries. (LEED)**
- **Training on when to wear personal protective equipment (PPE), what kind of PPE to wear, and how to put on and take off PPE to avoid cross contamination.⁷ Training should also include proper disposal of regulated waste and PPE. (LEED)**

Consider choosing a [cleaning service](#) that is certified to Green Seal's GS-42 Standard for Cleaning Services, which ensures third-party verified training and rigorous procedures for effective cleaning and disinfecting.

COVID-19 necessitates more than the usual cleaning and disinfecting training. To reduce the possibility of transmission, the World Health Organization recommends additional training on risk assessment and transmission-based precautions.⁸ Cleaning personnel should know how to recognize symptoms of COVID-19 and what to do if they exhibit any of the signs.

⁷ https://www.who.int/csr/resources/publications/ppe_en.pdf?ua=1

⁸ <https://www.who.int/publications/i/item/cleaning-and-disinfection-of-environmental-surfaces-inthe-context-of-covid-19>

According to the CDC, the following symptoms⁹ may appear 2-14 days after exposure to the COVID-19 virus:

- Fever or chills
- Cough
- Shortness of breath or difficulty breathing
- Fatigue
- Muscle or body aches
- Headache
- New loss of taste or smell
- Sore throat
- Congestion or runny nose
- Nausea or vomiting
- Diarrhea

If someone is showing any of the following signs, seek emergency medical care immediately:

- Trouble breathing
- Persistent pain or pressure in the chest
- New confusion
- Inability to wake or stay awake
- Bluish lips or face

Ensure that all new staff are properly trained before beginning at the worksite. Training on safe and correct usage should be provided for any new devices or types of cleaning or disinfectant products. The science surrounding the novel coronavirus continues to advance with new research, so ongoing trainings to keep staff updated on the best practices are recommended.

⁹ <https://www.cdc.gov/coronavirus/2019-ncov/symptoms-testing/symptoms.html>

3. Maintain Sustainability and Healthy Indoor Air

Enhanced cleaning and disinfecting protocols to protect against COVID-19 should not increase exposure to hazardous chemicals for cleaning personnel or building occupants. CDC has identified asthmatic individuals as a high-risk group for COVID-19.¹⁰ Choosing safer products, especially those that do not contain asthmagens, is critical for protecting this high-risk group.

Please do not hoard or overuse cleaning and disinfecting products, or other supplies. (LEED)

Protect Health During the Pandemic

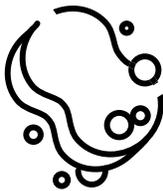
**Effective and responsible cleaning and disinfecting =
No unnecessary hazardous chemical exposure**



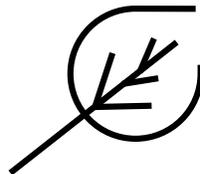
Choose green cleaning products that are certified for performance and safety



Select the disinfectants on EPA's List N that have safer active ingredients



Promote handwashing over hand sanitizer where possible, but choose certified green hand sanitizers where necessary



Choose certified green hand soaps

Cleaning Products

It may be tempting to choose conventional chemical cleaners, but the use of certified green cleaners, such as those certified by Green Seal, is more important than ever during this time of increased cleaning frequency. (LEED) Certified cleaners are proven to be as safe yet just as effective as harsher, more caustic cleaning products at removing dirt and grime.

Certified green cleaners have benefits beyond safer ingredients and proven efficacy: they are concentrates, designed to be diluted with unheated water, and thus they prevent packaging waste and reduce energy consumption for transportation and water heating.

¹⁰ <https://www.cdc.gov/coronavirus/2019-ncov/need-extra-precautions/people-at-higher-risk.html>

Disinfectants

There are many types of disinfectant products on EPA's List N, all of which are effective at deactivating SARS-CoV-2 if used correctly. Because disinfectants are designed to kill pathogens, however, none can be completely harmless, so EPA does not allow manufacturers to label disinfectant solutions with third-party certifications, such as Green Seal. Nevertheless, there are safer options.

Green Seal recommends choosing List N products with one of the following active ingredients:

- hydrogen peroxide**
- citric acid
- lactic acid
- ethyl alcohol (also called ethanol or just alcohol), or
- isopropyl alcohol
- peroxyacetic acid**
- hypochlorous acid

***The combination of hydrogen peroxide and peroxyacetic acid is a designated AOEC asthmagen, so avoid products that contain both.*

EPA's Design for the Environment program (DfE) has reviewed and approved the first six active disinfectant ingredients as being safer than other EPA List N chemicals, but just as effective. **LEED® also requires use of the active ingredients recommended by DfE to earn the LEED® pilot credit for cleaning and disinfecting.** (LEED) In addition to DfE's recommendations, hypochlorous acid is another active ingredient effective against the COVID-19 virus with a low hazard profile. Green Seal has certified several device-generated hypochlorous acid solutions for use as surface cleaners and disinfectants.

A product's inactive ingredients and other factors may affect its safety. Refer to the product safety data sheet (SDS) for information on whether the overall product is classified as hazardous by the Occupational Safety and Health Administration (OSHA).

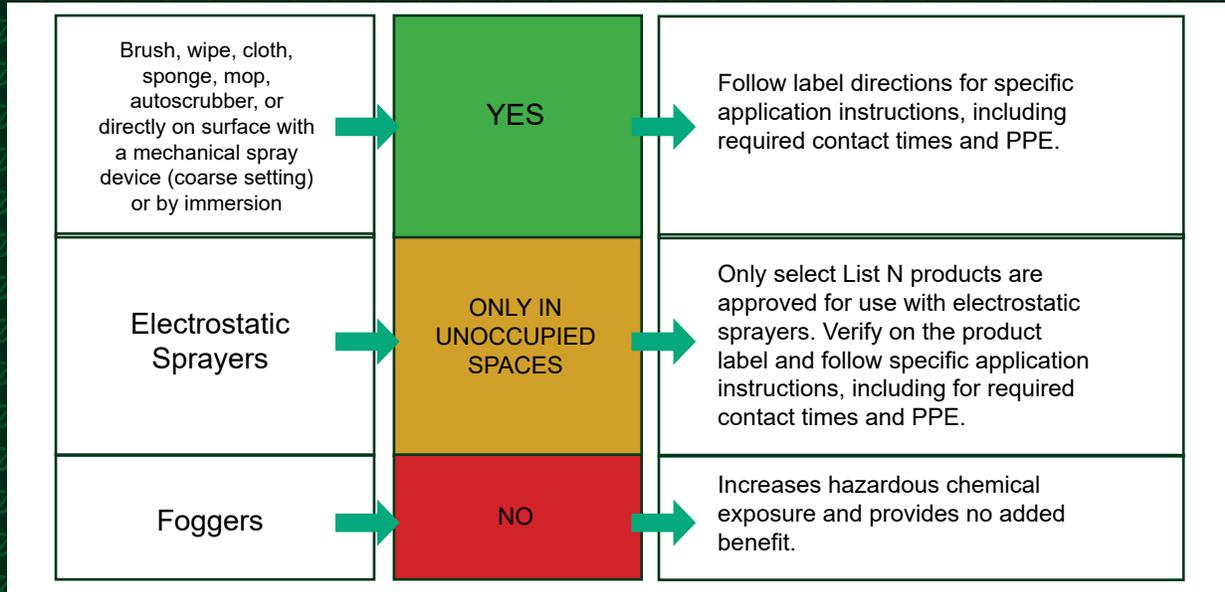
Hand Soaps and Sanitizers

There are many types of disinfectant products on EPA's List N, all of which are effective at deactivating SARS-CoV-2 if used correctly. Because disinfectants are designed to kill pathogens, however, none can be completely harmless, so EPA does not allow manufacturers to label disinfectant solutions with third-party certifications, such as Green Seal. Nevertheless, there are safer options.

Other Supplies

Increased cleaning and the associated increase in cleaning supplies, such as disposable gloves, are inevitable while the pandemic lasts. Wise purchasing decisions can nevertheless help lessen the environmental and health side effects of keeping people safe. Provide disposable hand towels with recycled content, such as those certified under Green Seal Standard GS-01, in restrooms without air hand dryers. Choose reusable options for cleaning where possible, such as microfiber towels and mops (which have the added benefit of requiring less water than other materials) that can be laundered after each use. Use trash bags, mops, buckets, and other cleaning tools that meet EPA procurement guidelines or other similar requirements.

Should you use these application methods if listed on a List N product label?



What disinfectant application options are there?

Like the disinfectants themselves, some application methods are safer than others. Some technologies being marketed for controlling COVID-19 unnecessarily increase hazardous exposures, and others require more proof of efficacy and safety.

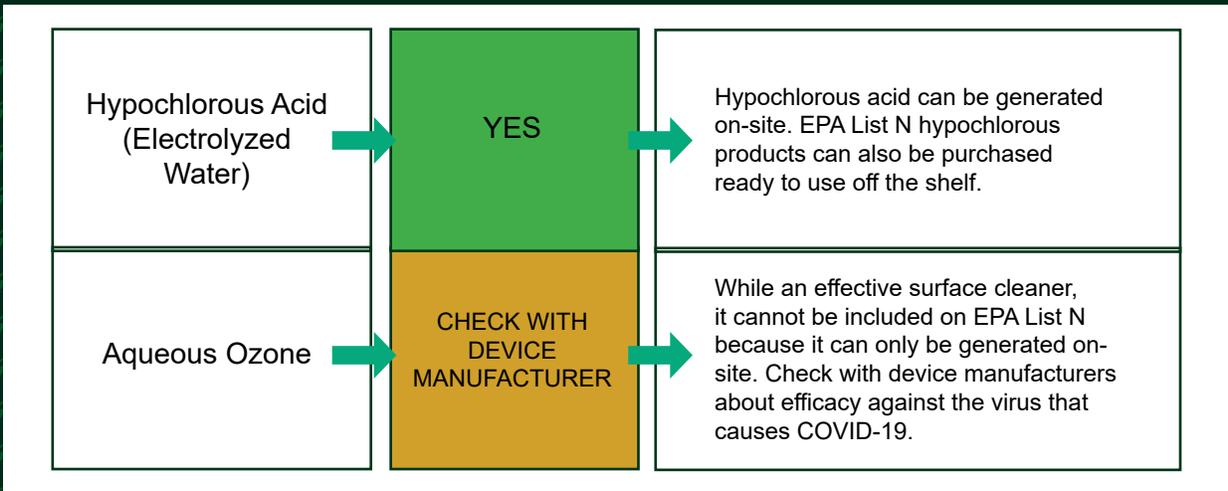
Only use application methods that are listed on the disinfectant's label. If instructions for a specific method are not found on the label, it means that the EPA has not reviewed any data on whether the product is effective or safe when applied this way.

- Wiping a surface with a cloth, mop, or sponge soaked in disinfectant leads to the lowest inhalation exposure. Using a trigger sprayer to spraying coarse droplets of disinfectant directly on the surface is another option, but can lead to increased risk of inhalation.
- Electrostatic sprayer devices spray disinfectant through a nozzle containing an electrode that charges the droplets to increase product coverage rates.
 - Only a small subset of EPA List N products is currently approved for use with electrostatic sprayers. Before applying a disinfectant with an electrostatic sprayer, it is important to verify that the product label specifies that the disinfectant is approved for use with electrostatic sprayers. If so, follow the label instructions for use with electrostatic sprayers and ensure that proper PPE is worn.
 - EPA and CDC are conducting further review to determine whether additional List N products are safe and effective when used with electrostatic sprayers.¹¹

¹¹ <https://www.epa.gov/newsreleases/epa-expands-research-covid-19-environment>

- Both CDC and WHO discourage using a fogger to saturate the air in a room with droplets of disinfectant.^{12,13} This method has not been proven more effective than other methods of application and can increase the risk of exposure to dangerous concentrations of chemicals. These conditions of use may limit the fogger’s usefulness in larger indoor spaces.
 - If the only option is to use foggers, choose products with safer active ingredients that list fogger on the label as an approved application method. Ensure that the room is properly sealed off to entry for the appropriate amount of time during and following disinfectant application, according to manufacturer directions. Ensure that appropriate PPE is worn.

Should you use device-generated solutions for disinfecting?



Can device-generated solutions be used?

EPA’s List N only includes registered pesticides. Pesticide devices are regulated differently by the EPA, so any solutions generated on-site by a device are not eligible for inclusion on List N. However, these device-generated solutions can still play an important role in cleaning and disinfecting.

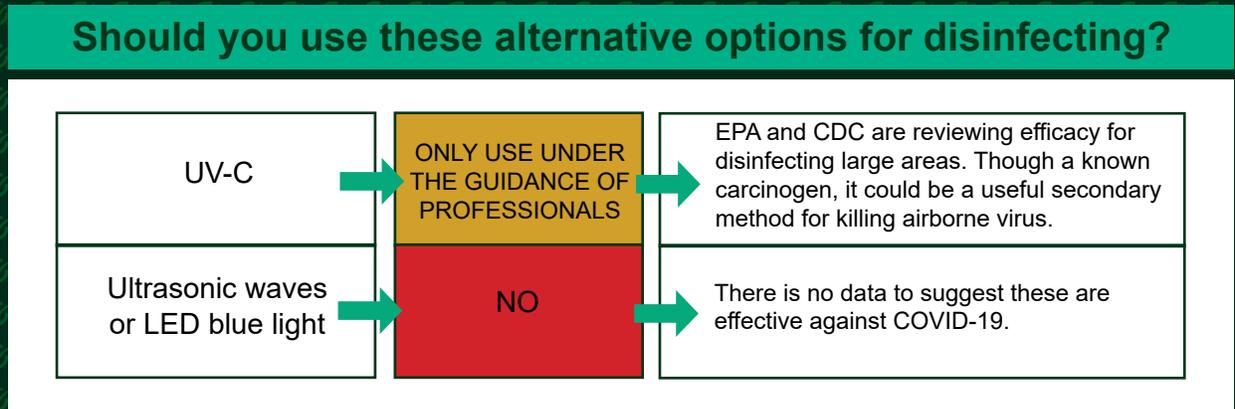
- As seen in an earlier section, EPA List N includes ready to use hypochlorous acid solutions that can be purchased.
 - If using device-generated solutions, refer to the device manufacturer for additional information on efficacy against the COVID-19 virus.
- Aqueous ozone is an effective surface cleaner and has been approved for use as a sanitizer for certain pathogens on surfaces. Aqueous ozone can only be generated by a device, so it is not regulated the same way as ready to use pesticides. EPA’s List N only include registered pesticides, so ozone is not eligible for inclusion on the list. Some device manufacturers have conducted studies that show that aqueous ozone can deactivate coronaviruses similar to the COVID-19 virus, and additional testing on the SARS-CoV-2 virus itself is underway.

¹² <https://www.cdc.gov/infectioncontrol/guidelines/disinfection/index.html>

¹³ <https://www.who.int/publications/i/item/cleaning-and-disinfection-of-environmental-surfaces-in-the-context-of-covid-19>

– Refer to the device manufacturer for additional information on efficacy and safety.

– Note: Ozone gas is toxic. When inhaled at high concentrations, ozone can damage the lungs and exacerbate asthma. At high concentrations, ozone can also damage materials such as rubber, fabric, and electrical wire coatings. EPA has not approved gaseous ozone generators for use in occupied indoor spaces.



EPA and CDC are conducting a joint evaluation on the efficacy of using ultraviolet, ozone, or steam to disinfect large-scale areas.

- UV-C light can reduce the total pathogenic load in air and on surfaces and has been shown to destroy coronaviruses similar to the COVID-19 virus. However, UV-C is a known carcinogen and can damage skin and eyes. Efficacy is also constrained by whether the light can reach the all the sides of materials and surfaces that may be covered with COVID-19 virus for a sufficient exposure time.

– Despite these limitations, UV-C light could be a useful secondary method of disinfection if applied safely, such as installation in air ducts to treat airborne viruses. **This is outside the scope of this guidance document.**

– Due to the known health hazards of UV-C, this technology should only be implemented by trained professionals.

– Note: Ozone gas is toxic. When inhaled at high concentrations, ozone can damage the lungs and exacerbate asthma. At high concentrations, ozone can also damage materials such as rubber, fabric, and electrical wire coatings. EPA has not approved gaseous ozone generators for use in occupied indoor spaces.

- No data indicate that *ultrasonic waves or LED blue light* is effective against coronavirus.¹⁴

¹⁴ <https://www.cdc.gov/coronavirus/2019-ncov/community/disinfecting-building-facility.html>

4. Communicate the Cleaning and Disinfecting Plan

COVID-19 is currently the top health concern for many, and transparency is critical for maintaining trust with property personnel, building occupants and other stakeholders. Develop and follow a communications plan to keep stakeholders apprised of actions being taken about the virus.

Communication Essentials

- ✓ Emergency communications procedures for suspected COVID-19 cases in the building
- ✓ Informational materials for cleaning personnel to share with building occupants
- ✓ Signs indicating whether spaces are closed for cleaning or safe to re-enter
- ✓ Actions people can take, like clearing workstations, to help cleaning personnel

The plan should specify an emergency communications procedure if there is a suspected COVID-19 case in the building. When the pandemic first reached the United States, cleaning personnel were not always advised that a space had been occupied by a suspected confirmed case¹⁵ – critical information that would have allowed them both to protect themselves and to clean and disinfect the space and protect building occupants. Cleaning staff must be told immediately about any suspected cases.

Building management should confirm when each tenant's space will be unoccupied and available for cleaning staff and have a protocol if the space is found occupied. Clear signage and emails identifying spaces closed for disinfecting and spaces safe to reenter will reduce confusion.

In addition, provide materials that cleaning personnel can share to answer occupants' questions about cleaning procedures. (LEED) Include actions that occupants should take to help cleaning personnel effectively clean and disinfect, such as clearing workstations at the end of each day.

¹⁵ <https://www.nytimes.com/2020/03/18/us/coronavirus-janitors-cleaners.html>

5. Provide Safer Working Conditions

To reduce the risk of COVID-19 transmission, implement building-wide policies for occupants and cleaning personnel to practice physical distancing of at least six feet from other individuals and to wear masks, regardless of the cleaning or disinfecting activity being undertaken.

COVID-19 has introduced considerations beyond those used to reduce exposure to chemical products for cleaning personnel. **For cleaning and disinfecting, the most effective PPE items should be worn, to protect staff from both the virus and the chemicals. (LEED)**

Provide safer working conditions

- | | |
|----------------------------|---|
| ✓ Physical distancing | ✓ Changing room and clothing storage for cleaning personnel |
| ✓ Paid sick leave policies | ✓ Personal Protective Equipment (PPE) |
| ✓ Adequate ventilation | ✓ Hand hygiene supplies and reminders |
| ✓ Vaccination promotion | |

Additional precautions can be implemented to create a safer work environment for both occupants and cleaning personnel:

- Provide adequate ventilation to help reduce transmission of COVID-19 as well as reduce buildup of indoor air pollutants that are released during cleaning and disinfecting.¹⁶
 - Facilitate effective hand hygiene. Where water and soap are unavailable for handwashing, provide alcohol-based hand sanitizer (containing at least 60% ethanol or 70% isopropanol). Remind people to avoid touching the eyes, nose, or mouth with unwashed hands.
 - Discuss the importance of vaccination and paid sick leave with service provider partners. Vaccines are the most effective method to drastically slow transmission. Reducing barriers, such as providing paid time off to get the vaccine and to recover from side effects, can increase vaccination rates. CDC has also found that paid sick leave reduces viral transmission.¹⁷
 - Provide space for cleaning personnel to store a change of clothes and a place to change out of uniforms or designated work clothes at the end of their shift.¹⁸ Facilitating this simple activity will help reduce the risk of spreading the virus outside of the workplace.
- Encourage cleaning service providers to use tools, equipment, and procedures to reduce ergonomic injuries. (LEED)**

¹⁶ https://www.aiha.org/public-resources/consumer-resources/coronavirus_outbreak_resources/aiha-covid-19-pandemic-efforts

¹⁷ <https://pubmed.ncbi.nlm.nih.gov/23763426/>

¹⁸ <https://www.health.state.mn.us/diseases/coronavirus/schools/cleanihe.html>

Conclusion

Properly implemented, the effective and responsible cleaning and disinfecting practices recommended in this document will help protect building occupants and cleaning personnel during the COVID-19 pandemic while avoiding the use of hazardous chemicals, technologies and practices that increase health risks yet provide no additional protective benefits.

Cleaning and disinfecting is only one aspect of maintaining the health and wellness of building occupants. The building environment can help limit the spread of COVID-19 if air filtration and humidity levels are increased. Workplace policies, including physical distancing, wearing face masks, and paid sick leave, can also reduce virus transmission.¹⁹

In addition to these Green Seal guidelines, other organizations have useful resources for safer workplace reopening. These include the EPA, the CDC, International WELL Building Institute, Building Owners and Managers Association International (BOMA Intl), FITWEL, the American Institute of Architects (AIA), and Cushman Wakefield.^{20,21,22,23}

¹⁹ <https://www.fitwel.org/covid-19/>

²⁰ <https://resources.wellcertified.com/tools/strategies-from-the-well-building-standard-to-support-in-the-fight-against-covid-19/>

²¹ <https://www.boma.org/coronavirus>

²² <https://www.aia.org/resources/6292441-re-occupancy-assessment-tool>

²³ <https://www.cushmanwakefield.com/en/insights/covid-19/recovery-readiness-a-how-to-guide-for-reopening-your-workplace>