PART 9: CLEANING & DISINFECTING

This section concerns recommendations for how to choose the correct cleaner/disinfectant, how to apply cleaning materials and ensure cleaning staff are protected, basics on air filtration, and more.

9.1 What steps can be taken to ensure that disinfection is done properly?

When disinfecting against SARS-CoV2 (the virus that causes COVID-19), use disinfectants that are on EPA's List N: Disinfectants for Use Against SARS-CoV-2 and formulated with the active ingredients recommended by EPA's Design for the Environment Logo for Antimicrobial Pesticide Products. (As of May 2020, the active-ingredient list includes hydrogen peroxide, citric acid, L-lactic acid, ethanol, isopropanol, peroxyacetic acid, and sodium bisulfate). If concentrated disinfectants are diluted to the proper solution using a portion-control device, put in place a testing protocol to ensure that the correct dilution rate is achieved. Inexpensive test strips (under 10¢ each) are available for many disinfectants.

Cleaning-chemical products should meet EPA Safer Choice Standard; Green Seal standards GS-37, GS-40, GS-52/53; UL Ecologo 2792, 2795, 2777, 2798, 2791, 2796, 2759; or should be used only with devices that use water, ionized water, electrolyzed water, or aqueous ozone and have third-party–verified performance data equivalent to those standards.

If the device is marketed for antimicrobial cleaning, performance data must demonstrate antimicrobial performance comparable to EPA Office of Pollution Prevention and Toxics and Design for the Environment requirements, as appropriate for use patterns and marketing claims.

9.2 What type of hand soaps should be used?

First, prioritize hand-washing with plain soap and water over hand sanitizers when possible.

Hand soaps should meet one or more of the following standards: EPA Safer Choice, Green Seal GS-41, or UL Ecologo 2784. Or they should have no antimicrobial agents (other than as a preservative) except where required by health codes and other regulations (for example, food-service and healthcare requirements).

When soap and water are not available, use hand sanitizers that contain at least 70% alcohol.

9.3 Is there a recommendation for paper towels, mops, buckets, etc.?

Use paper towels, wiping/drying products, mops, buckets, and other tools that meet one or more of the following standards: EPA comprehensive procurement guidelines for janitor paper and plastic trash-can liners; Green Seal GS-01 for tissue paper, paper towels, and napkins; UL Ecologo 175 for toilet tissue and hand towels; or FSC certification for fiber procurement. Also, use cleaning equipment with ergonomic-design features to reduce worker injuries from, for example, vibration, noise, and user fatigue.

9.4 Any recommended procedures on cleaning and disinfection?

Procedures should meet the joint requirements of CDC and EPA on Reopening Guidance for Cleaning and Disinfecting Public Spaces, Workplaces, Businesses, Schools, and Homes.

Procedures should also optimize cleaning-personnel resources and minimize unnecessary use of valuable cleaning products and equipment. Do not overuse or stockpile disinfectants or other supplies. When possible, adjust spaces to minimize frequently touched surfaces and regularly update cleaning personnel on building-occupant activities to ensure that cleaning aligns with the way the building is being used.

Also identify "high-touch points" along with frequencies for cleaning and disinfecting the different objects so designated and have procedures for quantitative testing of surface cleanliness.

9.5 What do we do about protecting those who are cleaning?

Provide personal protective equipment (PPE) — including eye protection, masks, gloves, and gowns — for all cleaning personnel as required by the products and processes being used. Also, consider the requirements of the buildings and its occupants relative to COVID-19.

Use tools, equipment, and procedures that reduce worker ergonomic injuries (for example, to the back, shoulders, and knees).

Also, train personnel about how to properly put on PPE, take it off, and dispose of it.

Train personnel on the hazards of the cleaning chemicals used, in accordance with OSHA's Hazard Communication standard (29 CFR 1910.1200), and comply with OSHA's standards on Bloodborne Pathogens (29 CFR 1910.1030), including proper disposal of regulated waste and PPE (29 CFR 1910.132).

Train on the basics of infection control and the science of cleaning, PPE, ergonomics protection for workers, hazards of disinfectant and other chemical products, disposal of cleaning chemicals, proper use and maintenance of chemical-dispensing equipment, and other products and equipment used in the cleaning process.

9.6 Quality and safe airflow is also a concern. Any recommendations for that issue?

For a building environment, take steps to improve ventilation in the building:

- Increase the percentage of outdoor air (for example, using economizer modes of HVAC operations) potentially to as high as 100% (first verify compatibility with HVAC-system capabilities for both temperature and humidity control as well as with outdoor/indoor-air–quality considerations).
- Increase total airflow supply to occupied spaces, if possible.
- Disable demand-control–ventilation (DCV) controls that reduce air supply based on temperature or occupancy.
- Consider using natural ventilation (opening windows if that is possible and safe to do) to increase outdoor-air dilution of indoor air when environmental conditions and building requirements allow.

- In general, take advantage of the ability to spread the production team and personnel over a wider geographic area to allow more social distancing.

9.7 What about air-filtration methods?

Increase air filtration to as high as possible (MERV 13 or 14) without significantly diminishing design airflow. The fraction of particles removed from air passing through a filter is termed "filter efficiency" and is provided by the Minimum Efficiency Reporting Value (MERV) under standard conditions.

MERV ranges from 1 to 16; higher MERV = higher efficiency:

- MERV ≥13 (or ISO equivalent) are efficient at capturing airborne viruses.
- MERV 14 (or ISO equivalent) filters are preferred.
- High-efficiency particulate air (HEPA) filters are more efficient than MERV 16 filters.

Overall effectiveness of reducing particle concentrations depends on several factors:

- Filter efficiency
- Airflow rate through the filter
- Size of the particles
- Location of the filter in the HVAC system or room-air cleaner

Increased filter efficiency generally results in increased pressure drop through the filter. Ensure that HVAC systems can handle filter upgrades without negative impacts to pressure differentials and/or air-flow rates prior to changing filters.

Generally, particles with an aerodynamic diameter around 0.3 μm are most penetrating; efficiency increases above and below this particle size.

Consider running the ventilation system even during unoccupied times to maximize dilution ventilation.

Generate clean– to less-clean–air movement by re-evaluating the positioning of supply and exhaust-air diffusers and/or dampers and adjusting zone-supply and exhaust-flow rates to establish measurable pressure differentials. Have staff work in areas served by "clean" ventilation zones that do not include higher-risk areas, such as visitor reception or exercise facilities (if open).

Also consider using portable HEPA fan/filtration systems to help ultraviolet germicidal irradiation (UVGI) as a supplement to help inactivate the virus.

Be sure to implement changes and confirm that building systems are operating as expected. If using air-treatment measures, use devices with third-party testing to ensure that no harmful byproducts are produced.

To minimize ozone generation, for example, the air-cleaning device should be listed and labeled in accordance with UL 2998, and ultraviolet-generating devices in supply air or spaces shall not transmit 185-nm wavelengths. This wavelength produces ozone.