LRC Indoor Testing & Research
140 Iowa Lane, Suite 102
Cary, NC 27511

Indoor Environment Cleaning & Disinfection

COVID-19 DECONTAMINATION

WORKER PROTECTION
Personnel conducting the decontamination should be healthy and trained to properly use appropriate personal protective equipment (PPE). At a minimum, this includes disposable coveralls, gloves, eye protection, and N-95 particulate filtering mask (RIA, 2020). Following the decontamination, any workers who fall ill within the following two-weeks for any reason, must report it to their supervisor for assessment by a medical professional.

SARS-CoV-2 (COVID-19)
The COVID-19 Human Coronavirus is an enveloped, single-stranded RNA virus, very similar to the SARS-CoV virus from 2002-2003. Previous research showed that animal coronaviruses could survive from 5-28 days on hard surfaces, depending upon air temperature and RH (Casanova et al, 2010); and a more recent study has confirmed that COVID-19 can survive up to 2-3 days on plastic and stainless steel, 4 hours on copper, and up to 24 hours on cardboard (van Doremalen,et al, 2020). While studies on coronavirus survival on fabric are scant, data show survival on cotton cloth for only one hour (Lai et al, 2005).

DECONTAMINATION
Enveloped viruses have a lipid coat that renders them very susceptible to inactivation by detergents and disinfectants. It is important to understand that the first approach to microbial reduction in any environment on any hard surface, is to conduct cleaning first, to physically reduce contamination, followed by application of a disinfectant to inactivate any remaining residual (Cole, 2019). This is also consistent with EPA-registered disinfectants that require use on "clean" surfaces. Many disinfectants in the marketplace have virucidal coronavirus label claims or are shown on the label as pre-approved for use against emerging pathogens (EPA, 2020). Steam cleaning is also effective at inactivating viruses within 1.0 second at 100°C (Firquet et al, 2014).

Thus, as an approach to cleaning and disinfecting an indoor environment in response to the COVID-19 virus is synonymous with an approach toward cleaning and disinfection as a major component of healthcare infection control. And that involves the following steps:

- ✔ **Assess the scope of the job**. This will determine the personnel, equipment, and materials and supplies needed to complete the job. If less than the entire occupied area of the

structure is to be decontaminated, determine the location and sizes of those areas to be cleaned and disinfected, such as common areas, breakrooms, special equipment rooms and restrooms.

- ✔ **Shut down the HVAC** system to prevent the spread of aerosols throughout the structure.

- ✔ **Identify and clean hard surface, high-touch contact points** using trigger spray application of cleaner (allowing dwell time if one-step cleaner/disinfectant is used), with wipe down using disposable towels, and changing towels frequently to avoid cross-contamination. Most commercial cleaners are quaternary ammonium-based products. Avoid preparing and using bleach solutions, as they do not clean and are caustic and corrosive. High contact touch points typically include desktops, table tops, countertops, chair armrests, draw and cabinet pulls, appliance handles and doors (microwaves, refrigerators), elevator buttons, key card devices, door handles, knobs, and breaker bars, all exterior vending machine surfaces, and water fountains. All restroom surfaces must be cleaned to include toilets, seats, stall doors and pulls, flush handles, paper dispensers, sinks and faucets, entry door plates, and floors. For large surface areas, such as hallway walls and floors, detergent applied with a squeegee may be used to clean the surfaces.

- ✔ **Apply appropriate disinfectant** by hand, fogging, or use of a low-pressure hand sprayer, and allow to air dry. Again, avoid the use of bleach solutions, as they are caustic and corrosive.

- ✔ **Conduct HEPA vacuuming** of soft fabric items that can't be laundered, such as upholstered furniture.

- ✔ **Activate the HVAC system** upon completion of cleaning and disinfection.

- ✔ **Run HEPA air scrubbers** for 24 hours throughout the area.

- ✔ **Remove and Dispose of Personal Protective Equipment (PPE)** outside of the cleaned and disinfected building. If removed inside, particulates could be shed that contain the virus.

CLEANING VALIDATION (Optional)

Presently, no methods exist to conduct clearance testing for COVID-19 or any other viruses. However, for some measure of assurance, it is possible to randomly sample hard surfaces to assess whether cleaning and disinfection has achieved an acceptable level of decontamination (to include microbes and associated residues), and determine whether additional cleaning is necessary (Shaughnessy et al, 2013). This testing can be done using ATP sampling to test random areas of a cleaned structure and compare results with an established baseline of acceptable post-cleaning ATP values previously generated by thousands of samples across a variety of surface materials. If areas are identified that indicate incomplete cleaning, then those

surfaces would require re-cleaning. Thus, an experienced team that is familiar with ATP sampling and interpretation would need to be contracted for that purpose.

DISCLAIMER

The above protocol is provided as a guide for professional remediation companies. It in no way warrants that following this protocol will result in a virus-safe environment, as degree of contamination, as well as user experience, equipment, products, and other procedures may produce varied results. Use of this protocol by any party is voluntary and LRC doesn't warrant, imply or guarantee specific results.

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