GALLAGHER BASSETT | TECHNICAL SERVICES

Disinfection "Fogging" as a Response to COVID-19 Outbreaks

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We have been asked by our customers as to the appropriate use of an aerosol spray or fogging as a disinfectant to combat the Coronavirus (COVID-19). There is conflicting information as to the effectiveness of these various procedures and the differing chemicals being used.

“Fogging” as a general term refers to the dispersal of finely disposed droplets of disinfectant to treat the surrounding air and surfaces. (Application of disinfectants such as chlorine dioxide or ethylene oxide in the gas phase, for purposes of discussion here, will not be classified as "fogging.") Fogging is a process developed in the food handling/production and pharmaceutical industries over the last decades. It has also been incorporated into some applications in the hospitals/health care industries to varying degrees. Similarly, some aspects of the mold remediation industry have embraced fogging technology. Since the purpose is to control/eliminate surface microbiological contamination, fogging logically has some applicability to biologically-related emergency response such as the COVID-19 pandemic.

There are a variety of disinfectants and delivery systems that are commercially available and utilized, but for ease of discussion, these can be viewed as either "wet" or "dry" processes. Traditional wet fogging is the process in which a liquid disinfectant is dispersed as relatively large droplets (greater than 10 micrometer diameter), that drop out of the air quickly and “wet" the surface. It should be noted only specific disinfectants are approved by the EPA for this use. One of the objectives is to ensure coverage of the disinfectant on all surfaces. While the contact results in the likely deactivation or reduction of target host microorganisms, there is the potential for damage to electronics and other sensitive equipment. Dry fogging, which was developed more recently, generates smaller aerosols (less than 10 micrometer diameter) that tend to disperse more readily and, since the water used to "carry" the disinfectant evaporates readily, surfaces are dry after application. One variation of the dry process (electrostatic spraying) charges the particulates on discharge for better adherence to surfaces upon settling. The success of all of these processes depends upon surface contact of the disinfectant with the biological agent.

Fogging offers several potential advantages as these portable systems precisely control the amount and distribution of disinfectant, and (theoretically) penetrate into inaccessible/void spaces that preclude direct contact cleaning. However, it should be noted that not all disinfectants are recommended for all manual or fogging delivery/application, and their EPA registration is partly dependent upon how the disinfectant is applied. Major differences among the two general fogging technologies are differences/ applicability of a given disinfectant, coverage, and potential damage to building surfaces/contents. For example, the density of the aerosol in wet systems results in stratification near the floor and requires some mechanical ventilation for distribution, as well as managing relative humidity and temperature to be optimally effective. Nevertheless, vaporized hydrogen peroxide (VHP) is a wet fogging application that has been a standard in the research/university biological laboratory industry for several years. The constraint of this system is that it is limited to smaller interior spaces. Dry systems may have better distribution, and appear not as sensitive to temperature and humidity ranges. Also, there is some evidence

of less potential damage from corrosivity. As far as effectiveness, much of the data for dry fogging are based upon small-scale laboratory or bench tests for target microbial contaminants and not "real world" applications. This parallels the case for the virus that causes COVID-19 given there has not been a widely available surface test for the effectiveness of fogging.

CDC recommendations for cleaning/disinfection, to include hand wiping of "high touch surfaces" with an approved disinfectant, establish the current standard of care. While this is the fundamental step in any response protocol, it also requires constant refreshing of disinfectant and towels/cloths. Ideally, disposable wipes with a "one and done" procedure are utilized to increase effectiveness and minimize human error. Fogging, while not a recommended standalone approach, certainly provides an added supplemental step that, depending upon circumstances, should be considered. However, it is not simply a matter of procuring a fogging system, loading disinfectant, and activating a switch. Fogging should be conducted in unoccupied areas under a formal work plan by experienced specialty contractors with appropriate personal protective equipment. Finally, any fogging regimen needs to be integrated with an overall program that involves CDC recommendations for hand wiping/mechanical cleaning.

Our recommendations remain:

1. Fogging should only be deployed as a component of a hand cleaning protocol.
2. Serious attention must be paid to the exact product and delivery mechanism to be deployed. Various EPA approved disinfectants may or may not be approved for fogging. Verify EPA *registration* as well as labeling. Ensure compatibility between chemical and appropriate (porous vs. non-porous) surfaces and sensitive electronics, equipment, building control systems and surface materials.
3. All cleaning and disinfectant applications should be applied by experienced and trained staff operating under an appropriate Health and Safety Plan (HASP), utilizing the appropriate Personal Protective Equipment (PPE).
4. Commercial firms performing disinfectant should be experienced and properly insured.
5. All work should be performed under a *Site-Specific* Cleaning Protocol, which addresses the space use, finished, HVAC system, occupant traffic patterns, etc.

Note: As a result of the outbreak of COVID-19, building owners and managers are seeking the above described services. It should be noted that no cleaning of any type or the use of any commercially available and approved chemicals will totally kill or eradicate the virus. The intention is to disinfect the space, removing as much of the virus and potential hosts as possible, and an attempt to mitigate spreading amongst building occupants. Also, note that there are no commercially available testing methods to definitively determine the presence or absence of Coronavirus pre-or post-cleaning. Test methods being deployed are intended to attempt to show cleaning efficiency, often testing surrogates and not the virus itself. Lastly, post decontamination/deep cleaning there will remain a requirement for facilities staff to conduct continuous and on-gong surface cleaning of high touch surfaces.

Respectfully Submitted,
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