UV-C Airstream Disinfection Application Guide for the COVID-19 Virus

The novel COVID-19 (SARS-CoV-2) belongs to the same family of the coronaviruses such as SARS and MERS-CoV. It is well documented that coronaviruses are highly susceptible to germicidal UV irradiation. The table below shows that the susceptibility of coronavirus is greater than 3 times compared to the influenza virus.

Airstream Disinfection					
Microbe	**Type**	**Type**	**RH**	**Diameter**	**UV Dose for 99% Inactivation**
			%	µm	µ-watt-s/cm^2
Coronavirus (incl. SARS)	ssRNA	Air	Lo Rh	0.11	**1200**
Influenza A virus	ssRNA	Air	Lo Rh	0.098	**4000**

Ref: Walker, Chris & Ko, Gwangpyo. (2007). Effect of Ultraviolet Germicidal Irradiation on Viral Aerosols. Environmental science & technology. 41. 5460-5

Correct Application of UV dose

It is very important to ensure that the targeted microorganism is exposed to a sufficient dose in the available space and time of UV exposure. Factors impacting the dose are airflow speed, lamp output, lamp arrangement, spatial constraints, temperature and humidity.

UV systems for air disinfection are typically designed to deliver significantly higher UV doses compared to those designed for coil disinfection. Coil disinfection is a surface application and therefore a large dose can be delivered with a low UV irradiance because of the essentially infinite exposure time. In contrast, the exposure time for a moving airstream in the duct is less than 1 sec (for a 8 ft duct length @ 500 fpm air velocity). Typical UV intensity values for coil disinfection are 50-200 µwatts/cm^2, whereas intensity values for airstream disinfection are typically 1000 µwatts/cm^2 or higher.

Selecting the Correct UVDI Product

UVDI utilizes a sophisticated modeling software to determine the optimal UV configuration required to inactivate different microorganisms for specific duct configurations. UVDI products have been carefully designed to provide the optimum balance of performance, energy consumption and cost.

V-MOD® systems utilize low output UV-C lamps and are designed to deliver appropriate UV doses for Coil disinfection only.

V-MAX™/V-MAX™ GRID systems utilize high output UV-C lamps and are designed to deliver UV dose for Airstream disinfection. Correct system design is modeled for specific AHU configuration, target microorganism and desired "kill" rate. These systems can also be used for Coil disinfection.

UVDI Recommends the Use of the V-MAX™ Product Family for Airstream Disinfection to Help Inactivate the COVID-19 Virus

Please consult with your UVDI representative for more information regarding selecting the correct product for your application.

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