

## **ABSTRACT: EFFICACY OF THE UVDI HVAC V-MAX UVC SYSTEM AGAINST AEROSOLIZED SARS-CoV-2**

**Background:** This in vitro study was designed to determine the efficacy of two different UV-C lamp mounting configurations in a modeled HVAC system. The product provided for testing by UVDI is a commercially available in duct modular UV-C system. The UVDI V-MAX UVC system is designed to be placed inside the HVAC ductwork or air handling unit (AHU) of a facility to decrease the spread of pathogens throughout the HVAC system while it is operating. For this challenge, the SARS-CoV-2-CA1/2020 pathogen was used. Coronavirus can be spread through the air and by touching contaminated surfaces. There is a demand for disinfectant devices that have a proven ability to reduce infectious pathogens in the air thereby reducing the risk of human infection and transmission. UVDI supplied a pre-packaged modular UV-C system which contained multiple pre-wired drivers and UV-C lamps. For the testing, power was supplied through a power regulated 120v outlet with surge protector and backup battery system. Test procedures were followed using internal SOPs for aerosolized viral pathogen challenges and subsequent decontamination. All internal SOPs and processes follow GCLP guidelines and recommendations.

**Results:** When tested against SARS-CoV-2-CA1/2020 virus, the presence of the UV-C system inside the modified HVAC ducting showed a reduction of detectable pathogen at the downstream collection point. Under optimal conditions with a pre-defined UV-C lamp orientation and CFM the system was able to achieve a 99.99% reduction of recoverable viral media in the airstream of the testing system.

## **EQUIPMENT PROVIDED:**

MANUFACTURER: ULTRAVIOLET DEVICES INC.

MODEL: V-MAX

SERIAL #: N/A



## **CONCLUSIONS:**

In test condition (A) with the UV-C lamps placed perpendicular to the airflow the UV-C system achieved an average reduction of 98.17% of collectable viral media. In test condition (B) with the UV-C lamps placed parallel to the airflow there was an observed 99.99% reduction of collectable vial media. Collection samples were compared to control value collections to obtain the average % reduction.

When aerosolizing pathogens and collecting said pathogens, there are variables that cannot be fully accounted for, namely, placement of pathogen, collection volume, collection points, surface saturation, viral destruction on collection, viral destruction on nebulization, and possibly others. Every effort was made to address these constraints with the design and execution of the trials. And these efforts are reflected in the meaningful recovery of virus in the control test.

Taking these variables into account, there was a high level of inactivation efficacy achieved by in-duct UV-C lamps in both placement orientations.