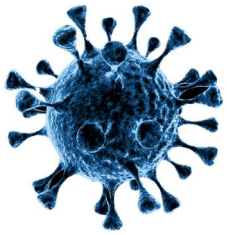
SARS-CoV-2 (COVID-19) 99.4% Reduction Testing Bulletin
Test Date 07/23/2020 – Release 09/01/2020

Top Product Innovations' advanced indoor air quality technology set to contribute to the global fight against SARS-CoV-2 (COVID-19)

Top Product Innovations Inc., a leading provider in Indoor Air Quality (IAQ) technology announced today that third party ionization testing results validated its technology's ability to effectively deactivate SARS-CoV-2 (COVID-19) surface strain with a 99.40% reduction. The bipolar ionization technology known as a Cold Plasma Generator (CPG) is powered by Needlepoint Clusters™.

Independent testing conducted by Innovative Bioanalysis, (BSL-3 Laboratory), utilized a testing chamber to better emulate environmental conditions of heating ventilation and air conditioning systems (HVAC) that are found in both residential and commercial applications. The results for the 60-minute test verified that 99.9% of the virus was inactivated at 60 minutes, 99.4% at 45 minutes, and 82.3% at 30 minutes.

EFFICACY AGAINST SARS-CoV-2 (COVID-19) VIRUS



This in vitro study was to characterize the Phenomenal Aire series C6 Cold Plasma system and determine efficacy against the SARS COVID-19 virus. The Phenomenal Aire series model C6 is designed to deactivate viral pathogens on surfaces and in the air to sanitize enclosed areas.

EXPERIMENTAL DESIGN

A custom designed metal container 72"x30"x30" was used for a direct inoculation testing site. The testing chamber had directed extraction exhaust vent on the top of the container with a HEPA filter to prevent accidental release of the viral media. During the course, of the test 2 AIC2 digital air ion counters were placed directly behind the sampling area and mapped ion levels for the duration of the test. One ion counter recorded negative ions being distributed and one recorded positive ions being distributed. The ambient air inside the container was 71.3F to 72.7F. During the control testing and the viral load tests the temperature fluctuation was consistent. The ambient humidity inside the test chamber was 44.1% and the airflow speed passing across the Aire Series C6 at the time of testing was averaged at 432 FT/M. During the control testing one fan was placed inside the chamber to create the same simulated air flow as the ionization unit.

- 4 stainless steel sample plates were placed 48" away from the center of the Ionization device down-wind from the airflow in an even row. Test pieces were inoculated with the virus by directly applying 1mL of viral media with a known concentration of 6.32 X 10^6 TCID50/mL, spread evenly on the plate and allowed to dry in the testing area. After adequate drying time, 1 sample swab was taken from each test piece at a 15-minute time point, 30-minute time point, 45-minute time point, and 1-hour time point post inoculation
- Swabs were sealed in individual tubular containers containing 1mL viral transfer media and stored in a sealed box for the duration of the test so no further ions could interact with them.

CONTROL SUMMARY

For the control section two separate AIC2 Air Ion counters were placed in the center of the testing chamber. The natural state of ions was counted, little fluctuations were observed. Ion counts were recorded every 0.5 seconds and the average for the duration of the test was 08 ions per cm3 without the needlepoint bipolar ionization units running. There was a spike to approximately 57 ions per cm3 when the unit was opened to remove the ion counters indicating the ion count outside the chamber was approximately 50-70 ions per cm3. Due to the negligible number of ambient ions in the air outside the chamber it was determined they would not interfere with test results.

VIRAL TITRATION DETERMINED BY TCID50 ASSAY PROTOCOL

Each of the 8 samples collected were subject to the same TCID50 assay protocol to determine viral concentration. Each collected swab was vortexed for 1 full minute in 1ml viral preservation media prior to serial dilution.

INNOCULATION OF THE TEST CARRIERS

Each of the 4 testing sites were simultaneously and equally subjected to a 1mL inoculation of viral media containing a known titer of 6.32 X 10^6 TCID50 per mL to ensure saturation of all materials.

EFFICACY TESTING

Viral media with a known concentration was applied via aerosol to the materials in 3 locations throughout the containment unit and exposed to bipolar ionization for a period of 15 minutes, 30 minutes, 45 Minutes, and 1 hour. Swabs were taken of all material and cultured by the same means as the original viral titration performed on the BEI Resources provided SARS-CoV-2 USA-WA1/2020 viral culture. The viral media was exposed to a consistent flow of ion density. The test objective was to obtain 15.0 x 10^3 ions /cc. Ion densities were measured every 5 seconds and the averaged ion density delivered was 15.1 x 10^3 ions /cc.

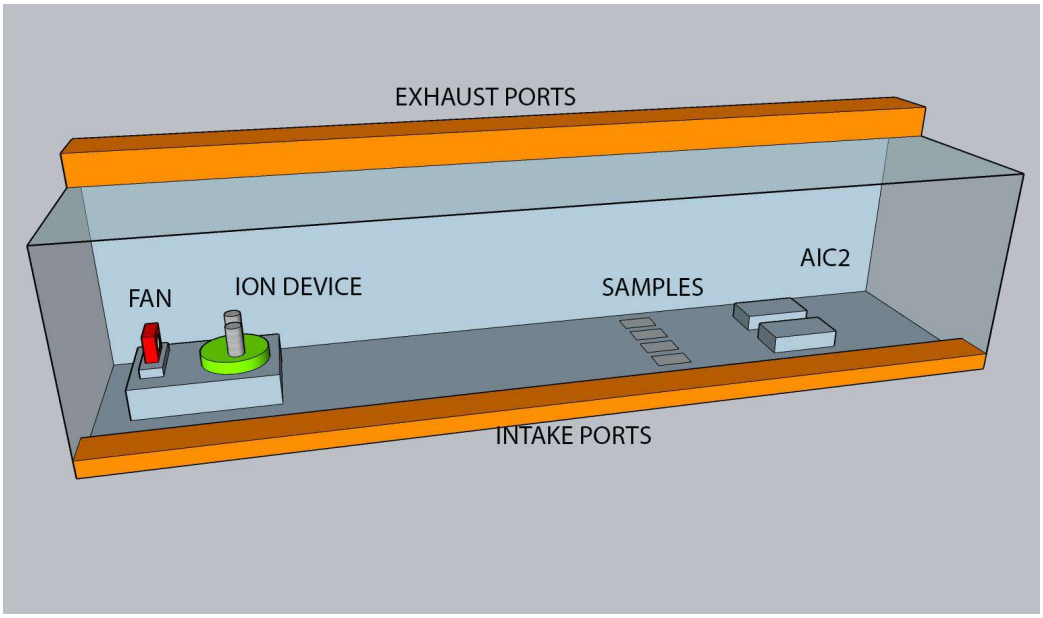


Figure 1: Test Chamber Design

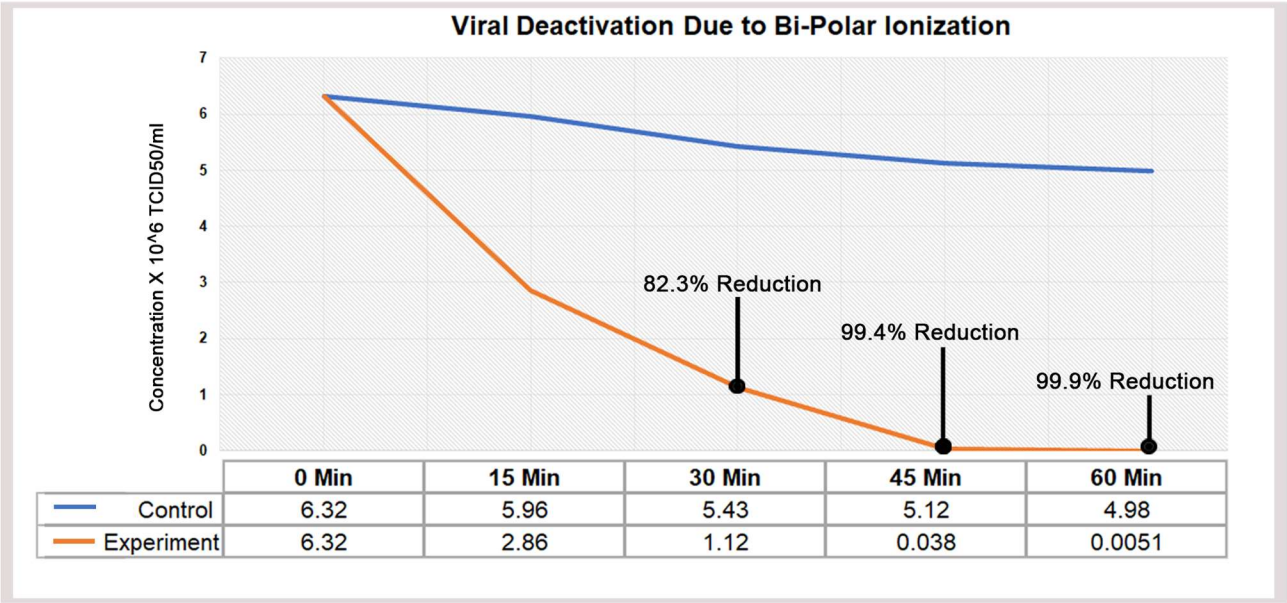


Figure 2: SARS-CoV-2 (COVID-19) 99.4% Reduction Testing Date 07/23/2020

Contact

Owen Blevins, Vice President of Sales
OwenBlevins@topproductinnovations.com