

TECHNICAL REPORT

Determination of anti-viral activity of Noble Biomaterials' X-STATIC Technology against human coronavirus OC43 strain

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Abstract

Noble Biomaterials initiated research to better understand X-Static Technology's antiviral effectiveness against human coronavirus. Procedure was industry-standard ISO testing against coronavirus strain OC43, the coronavirus most commonly associated with human infections. Findings were that X-STATIC Metallized Fabric demonstrated a statistically significant reduction in virus viability of the Human Coronavirus OC43 at the highest viral concentration whereas the control fabric showed no effect.

Materials and Methods

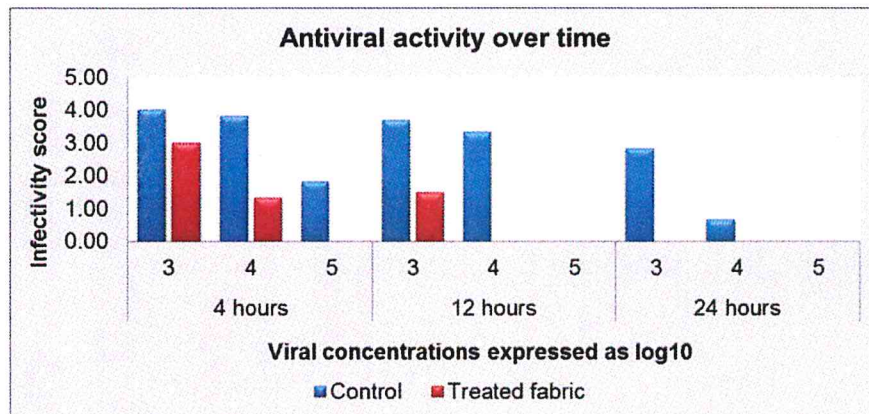
Methodology was to have an accredited third-party lab BioScience Laboratories, Inc. test human coronavirus strain OC43 on X-STATIC Metallized Fabric (style #90615) over time using ISO 18184 procedures. Human coronavirus strain OC43 is a strong strain of the virus and was tested in very high concentrations in this study. Control fabric used was an unmetallized version of the same fabric. All testing was performed in accordance with Good Laboratory Practices (GLP), as specified in 21 CFR Part 58 and the report has been cleared for direct submission to the US Food & Drug Administration (FDA).

Protocol

Testing was conducted based on the International Organization for Standardization (ISO) method ISO 18184:2019(E), Textiles – Determination of antiviral activity of textile product. The samples were inoculated with Human Coronavirus strain OC43 (ZeptoMetrix Corp. #0810024CF) and evaluated at the following timepoints: 4-hour, 12-hour, and 24-hour exposures. The untreated control material was also evaluated after inoculation. This protocol tested three replicates of both the test material and the control. The virus was eluted and plated onto susceptible cells in 8 replicates. Calculations of the estimated virus concentrations were performed using the Behrens-Kärber method.

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Results



Conclusions

Results provided by this accredited third-party lab meet the requirements for a valid test under ISO 18184 method criteria (adequate viral concentration, control fabric not effecting virus viability, low virus decay over testing timeframe, and host cells for virus infection are of acceptable viability). As indicated in the graph, the X-STATIC Metallized Fabric demonstrated a statistically significant reduction in virus viability of the Human Coronavirus OC43 at the highest viral concentration (3 log₁₀) whereas the control fabric showed no effect. X-STATIC Metallized Fabric performed better than the control sample on all tests.

Based on the above graph for Human coronavirus OC43, reduction of viability by time:

- X-STATIC fabric reduces human coronavirus 6x faster than control (4 hrs vs 24 hrs)
- Human coronavirus remained viable for 24 hours on a regular nonwoven fabric, but only 4 hours on an X-STATIC nonwoven fabric
- The infectivity rate of the virus after 4 hours is 3 times greater on the control fabric than on the X-STATIC metallized fabric (at 4log₁₀ virus concentration)
- 95% of human coronavirus are unviable after 4 hours on X-STATIC Metallized Fabric