THE EMPIRE STATE BUILDING

New York for New Yorkers
Empire State Building Observatory Reopening

July 11, 2020

EMPIRE STATE REALTY TRUST

ESRT LISTED NYSE

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Mission Statement

The Empire State Building is the authentic representation of New York City to billions of people around the world.

A marvel when built, it is now fully modernized for the 21st century. **No one building has connected more with New York City, New York State, the United States, or the world during the Covid-19 pandemic.**

ESB's lights and social media engagement have internationally celebrated the enduring New York spirit. From our "Pandemic Siren"; to our fundraiser that featured Billy Joel, ESB has **generated more than 33.2 billion media impressions in the United States, Australia, India, and China alone.**

New York City is not open without the Empire State Building Observatory. We share these plans to reopen under Phase 4, Low-Risk Indoor Arts & Entertainment as a public service to guide others to reopen our great city.

- **By Appointment Only**
  - Utilize **timed ticketing**
    - Available on www.esbnyc.com
    - Will prevent crowds outside and inside the Observatory
  - **Initially limit to 500 people** in facility at any one time
    - Above limit represents more than 80% reduction of the overall capacity – well below Phase 4 mandate
- **Visitor Protocol**
  - Required at Entrance
    - **Facial covering**
    - **Temperature screening**
    - Hand sanitization prior to entrance
  - Maintain Separation
    - 70,000 square feet
    - One-way traffic flow
    - **More than 18 feet of separation between visitors**
    - Staff and CCTV monitor compliance to social distancing
  - Exhibits Protocol
    - **Facial contact exhibits disabled and closed**
    - Touch screens to run automatically
    - Regular cleaning of all surfaces

- **Dedicated Entrance**
  - Tenants and Observatory visitors have separate entrances
- **Indoor Environmental Quality**
  - New system installed as part of $165 million Observatory redevelopment completed in December 2019
    - MERV 13 air filters
    - State-of-the-art air purification improves air quality and reduces the risk of virus transmission[1]
    - Fresh air ventilation
    - System designed to provide clean air to over 1,600 hourly visitors
- **70,000 Square Feet Over Five Levels**
  - First Floor, Entry
  - Second Floor, Security Screening and Exhibits
  - 80th Floor, Exhibits
  - 86th Floor, Indoor/Outdoor Observatory
  - 102nd Floor, Indoor Observatory
- **6 High-Speed Elevators In Operation Each Day**
- **Controlled Elevator Capacities - Staff Load and Dispatch Each Elevator**

[1] AtmosAir proven in lab tests by Microchem Laboratory to neutralize 99.92% of coronavirus, see appendix for report


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- **Employee Protocol**
  - **Training**
  - Masks
  - Gloves
  - Face Shields (additionally) for entry screeners
  - Back-of-house procedures
  - Contact tracing
- **Prior Experience**
  - Operated through March 16, 2020
  - **Demonstrated capability to operate with reduced capacity of 500 visitors prior to closing**
  - Took note of Visitor Behavior and built plans to adjust
  - **No staff contracted the virus from the workspace**


SECURITY
HEALTHY HANDS
START HERE
Purell

Empire State Building Observatory		
Total Sq. Ft.	70,000	4 Floors
Average Group Size	2.5	
Reduced Capacity	500	
Total Number of Groups	200	
Total Sq. Ft. Per Group	**350**	

Completed - Phase 4 Low-Risk Indoor Arts & Entertainment Checklist – Physical Distancing

Physical Distancing	MANDATORY	ESBO
1	Limit the workforce and patron/visitor presence to no more than 25% of maximum occupancy, inclusive of patrons/visitors, who must only be permitted entry into the institution if they wear an acceptable face covering, provided that they are over the age of 2 and medically able to tolerate one.	✓
2	Ensure a distance of at least 6 ft. is maintained among individuals (both patrons/visitors and employees) at all times, with the exception of groups visiting the institution from the same household, unless safety or the core activity requires a shorter distance, in which case individuals must wear acceptable face coverings.	✓
3	Ensure that employees wear face coverings any time they interact with patrons/visitors (e.g. ticket sales), and that all individuals, including employees and patrons/visitors, wear face coverings any time they're within 6 ft. of another person.	✓
4	For exhibits in a small area, calculate and enforce maximum occupancy limits and social distancing.	✓
5	Monitor/control flow of traffic into and within the institution to adhere to capacity requirements and enhance employee/security presence to enforce limitations on gathering size, as necessary.	✓
6	Only permit group tours for members of the same household or party and with a maximum capacity under social gathering requirements at the time, including employees and patrons/visitors.	✓
7	Close high-risk interactive exhibits (e.g. those requiring patrons/visitors to touch or wear objects).	✓
8	Close children's play areas or exhibits with play equipment, unless such areas/exhibits can be cleaned, disinfected, and sanitized between each child using the area/equipment who is not a member of the same household or party.	N/A
9	Move any picnic areas and benches 6 ft. apart or close them if they can't be moved.	✓
10	Operate in accordance with industry-specific DOH guidelines where appropriate.	✓

Completed - Phase 4 Low-Risk Indoor Arts & Entertainment Checklist – Protective Equipment

Protective Equipment	MANDATORY	ESBO
11	Ensure patrons/visitors are only permitted entry into the institution if they wear an acceptable face covering; provided they are over age 2 and able to medically tolerate one.	✓
12	Ensure patrons/visitors wear face coverings whenever they are in common areas or scenarios where it may be difficult to maintain 6 ft. of distance (e.g. entering/ leaving the facility, traversing an enclosed small exhibit, interacting with employees) and whenever they are within 6 ft. of individuals who are not members of their household or party.	✓
13	Ensure that any time employees come within six feet of another person, acceptable face coverings are worn. Employees must be prepared to don a face covering if another person unexpectedly comes within 6 ft. Employees also must wear face coverings any time they interact with patrons/visitors.	✓
14	Provide employees with an acceptable face covering at no-cost to the employee and have an adequate supply of coverings in case of need for replacement.	✓
15	Acceptable face coverings include but are not limited to cloth (e.g. homemade sewn, quick cut, bandana), surgical masks, and face shields.	✓
16	Clean, replace, and prohibit sharing of face coverings. Consult CDC guidance for information on PPE, as well as instructions on use and cleaning.	✓
17	Train employees on how to put on, take off, clean (as applicable), and discard PPE.	✓
18	Limit the sharing of objects among employees, as well as the touching of shared surfaces; or, require employees to wear gloves (trade-appropriate or medical) when in contact with shared objects or frequently touched surfaces; or, require employees to perform hand hygiene before and after contact.	✓

Completed - Phase 4 Low-Risk Indoor Arts & Entertainment Checklist - Hygiene and Cleaning

Hygiene and Cleaning	MANDATORY	ESBO
19	Adhere to hygiene, cleaning, and disinfection requirements from the Centers for Disease Control and Prevention (CDC) and Department of Health (DOH) and maintain logs on site that document date, time, and scope of cleaning and disinfection.	✓
20	Provide and maintain hand hygiene stations on site, including handwashing with soap, running warm water, and disposable paper towels, as well as an alcohol-based hand sanitizer containing 60% or more alcohol for areas where handwashing is not available/practical	✓
21	Make hand sanitizer available throughout common areas in the building (e.g. near exhibits).	✓
22	Provide appropriate cleaning/disinfection supplies for shared and frequently-touched surfaces (e.g. door handles, ticket counters) and encourages employees to use them before/after use of such surfaces, followed by hand hygiene.	✓
23	Conduct regular cleaning and disinfection of the building and more frequent cleaning and disinfection for high-risk areas used by many individuals and for frequently touched areas. Use Department of Environmental Conservation (DEC) products identified by the Environmental Protection Agency (EPA) as effective against COVID-19.	✓
24	Discontinue headsets/equipment loaned/rented to patrons/visitors unless they can be properly disinfected after each use.	N/A
25	If single-use items (e.g. maps) are not provided, ensure they are cleaned and disinfected after each use.	N/A
26	Provide for cleaning and disinfection of exposed areas in the event an individual is confirmed to have COVID19, with such cleaning and disinfection to include, at a minimum, all heavy transit areas and high-touch surfaces (e.g. badge scanners, restrooms, handrails, door handles, vending machines, communal coffee stations). Follow CDC guidelines on cleaning your facility after a suspected or confirmed case.	✓

Completed - Phase 4 Low-Risk Indoor Arts & Entertainment Checklist – Communication and Screening

Communication / Screening	MANDATORY	ESBO
27	Affirm you have reviewed and understand the state-issued industry guidelines, and that you will implement them.	✓
28	Post signage inside and outside of the retail location to remind personnel and customers to adhere to proper hygiene, social distancing rules, appropriate use of PPE, and cleaning and disinfecting protocols.	✓
29	Conspicuously post completed safety plans on site.	✓
30	Implement mandatory daily health screenings for employees and, where practicable, contractors and vendors (but do not mandate for patrons/visitors or delivery personnel), including an assessment (e.g. questionnaire, temperature check) asking about (1) COVID-19 symptoms in past 14 days, (2) positive COVID19 test in past 14 days, and/or (3) close or proximate contact with confirmed or suspected COVID-19 case in past 14 days. Responses must be reviewed and documented daily.	✓
31	Immediately notify the state and local health department upon being informed of any positive COVID-19 test results.	✓
32	Designate a site safety monitor whose responsibilities include continuous compliance with all aspects of the site safety plan.	✓

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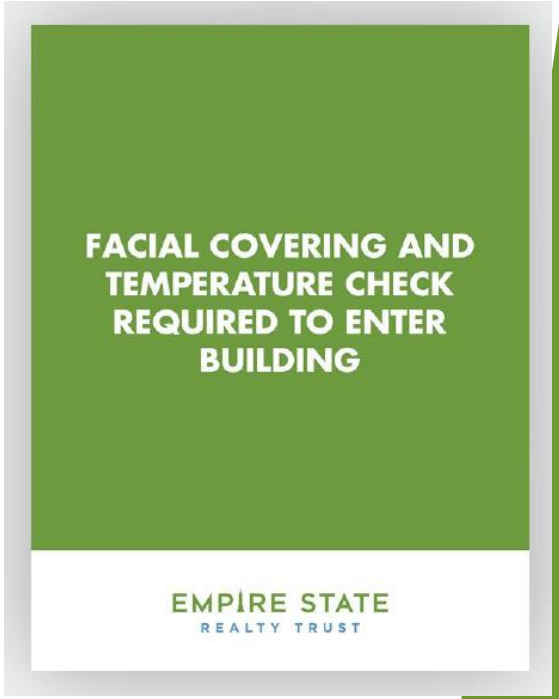
Temperature Screening

- Will take place before entering the Empire State Building Observatory
- 100.4 degrees Fahrenheit or higher will not be permitted
- All Visitors and Staff will be screened
- Security team to conduct temperature screening
- Screeners will wear Gloves, KN95 masks, and face shield



Personal Protective Equipment

- All Visitors and Staff required to wear facial covering at all times
- Empire State Building Observatory will provide all 125 daily Staff members with CDC approved face coverings and gloves

- Inventory will be maintained on a min/max basis ensuring a minimum of 5,000 units always on hand and is sourced through an existing vendor with whom the Empire State Building has long history

Transactional Positions - PPE

- Face Shields, KN95 masks and gloves are required at all transactional posts
  - Temperature Screening
  - Will Call desk
  - Security Screening
  - Cashiers
  - Retail

- Inventory will be maintained on a min/max basis ensuring a minimum of 500 units always on hand and is sourced through an existing vendor with whom the Empire State Building has long history

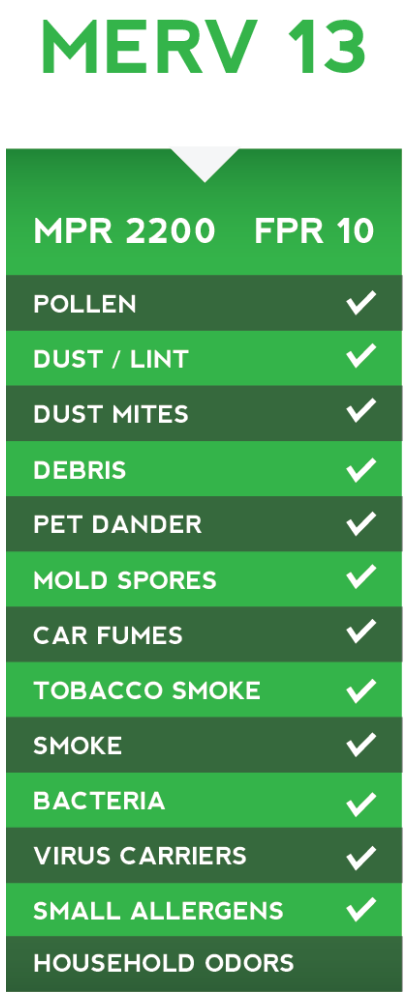
Personal Hygiene

- Staff will be continuously trained and encouraged to adhere to CDC guidelines for handwashing & preventive measures

- Hand Sanitizer will be available throughout the Empire State Building Observatory and back-of-house for Visitors and Staff

Indoor Environmental Air Quality

- The Empire State Building deploys MERV 13 air filters in all of the air handling units that serve the Observatory space
- In addition to utilizing MERV 13 filtration, the Empire State Building Observatory has upgraded its HV/AC system to include AtmosAir
- AtmosAir is a proven air purification technology that acts as a continuous disinfectant, actively reducing airborne and surface contaminants such as odors, VOCs, viruses, smoke, bacteria, and germs
- Continuous ventilation, or the introduction of fresh air and exhaust of indoor air through system designed to handle more than four times the initial 500 visitor capacity



Cleaning

- Frequent sanitizing of all high touch surfaces (*see appendix*)
- Overnight Electrostatic Disinfectant spray of the entire Observatory space
- Shut down exhibits that require close facial contact

Communication & Training for Staff

- Proper Hygiene Protocols
  - Clear Desk Guidelines
  - Cleaning Procedures & Company-Provided Cleaning Supplies

- Social Distancing Protocols
  - Guidelines for corridors, elevator banks, inside elevator cabs (signage provided)
  - Guidelines for common areas: restrooms, breakrooms, changing rooms, and at water refill stations (signage provided)

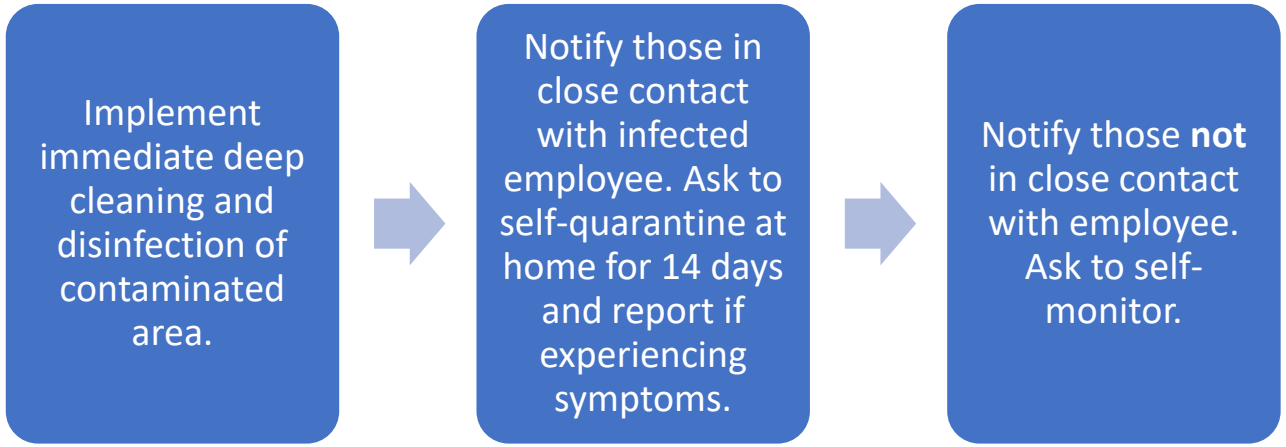
Communication & Training for Staff (Continued)

- Use of PPE required for access to the building (signage provided)
  - Face coverings
  - Hand sanitation
  - Temperature screening

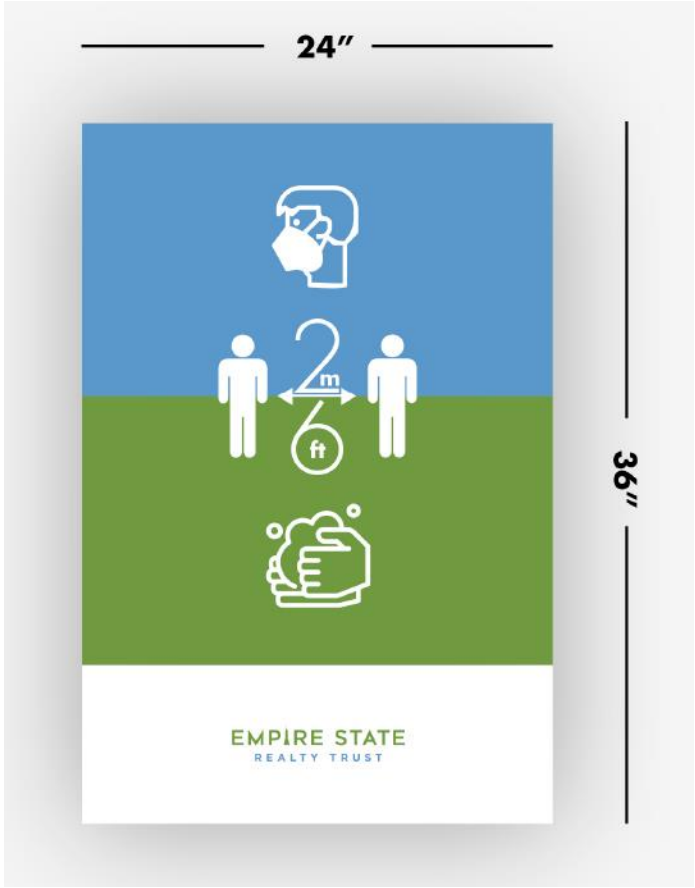
- Cleaning & Disinfecting Protocol
  - Enhanced sanitation procedures implemented in all spaces

Contact Tracing (Employee)

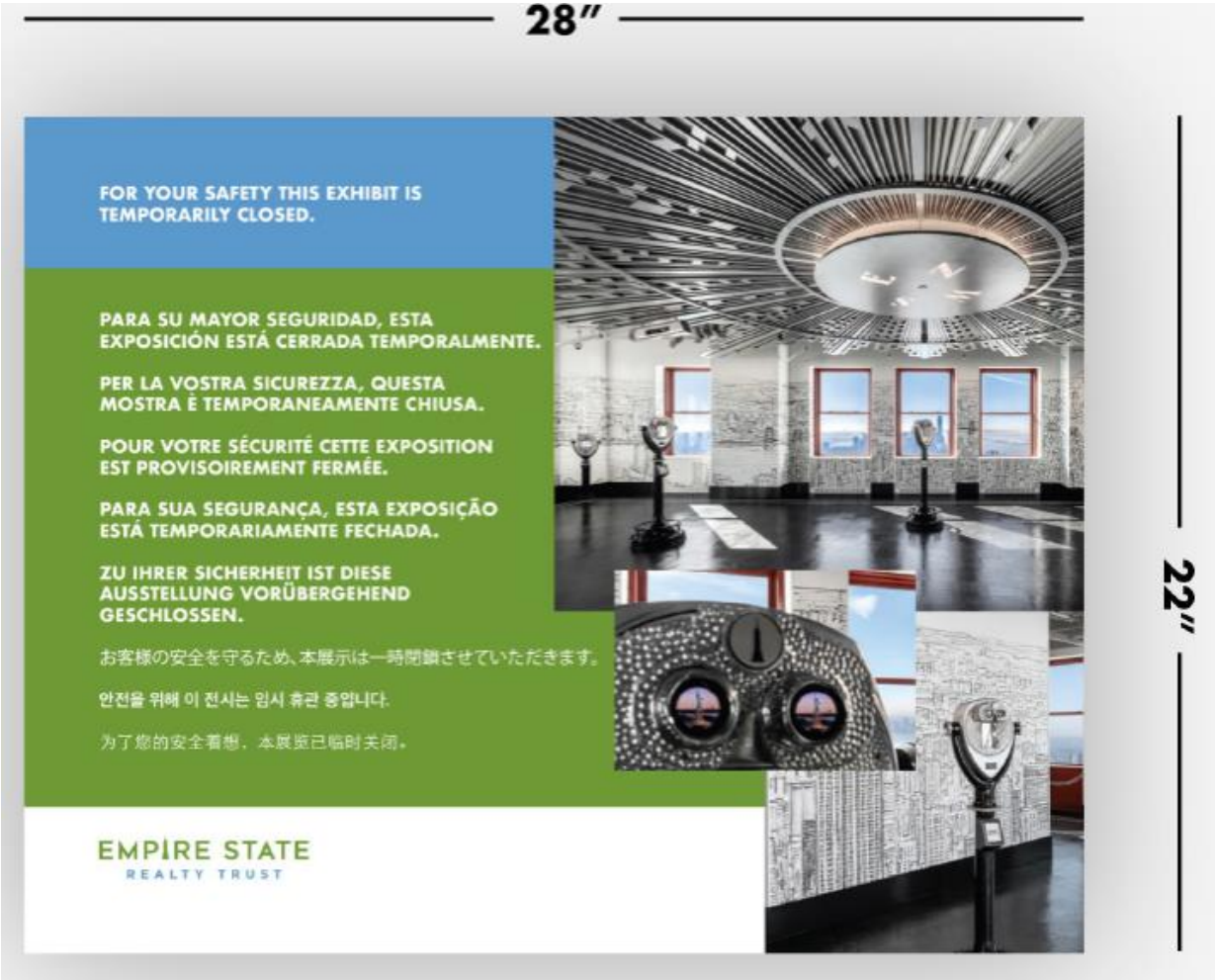
ESRT has developed a standard operating procedure to cover cleaning, disinfection, and contact tracing.



Signage Located Throughout Entire Observatory Experience



Displays to Feature Multiple Languages



Appendix

STUDY REPORT

Study Title
Virucidal Efficacy of a Test Substance For Use on Inanimate, Nonporous Surfaces

Product Identity
AtmosAir Matterhorn Series

Test Microorganism
Human Coronavirus, Strain 229E, ATCC VR-740

Study Identification Number
NG15291

Author
Tamisha Smith, B.S.
Study Completion Date
04JUN2020

Testing Facility
Microchem Laboratory
1304 W. Industrial Blvd.
Round Rock, Texas 78681

Study Sponsor
AtmosAir Solutions
Tony Abate
418 Meadow Street, Suite 204
Fairfield, CT 06824

AtmosAir Solutions - Study ID: NG15291

General Study Information

Study Title:	ASTM E1053 Method (Modified) Virucidal Efficacy of a Test Substance For Use on Inanimate, Nonporous Surfaces
Study Identification Number:	NG15291

Test System

Test Microorganism(s):	Human Coronavirus, Strain 229E, ATCC VR-740
Host Cell(s):	MRC-5, CCL-171
Test Substance:	AtmosAir Matterhorn Series
Test Substance Receipt Date:	09APR2020

Test Parameters

Test Substance Dilution:	Ready to use
Test Substance Application:	Fogging (The Matterhorn device for this study was calibrated to an ion saturation of 1,500 ions per cm^3)
Organic Soil Load:	No additional soil load incorporated into inoculum
Number of Replicates Per Contact Time:	3
Contact Time(s):	30 minutes, 60 minutes, and 120 minutes
Exposure Temperature:	Ambient room temperature (25.2 – 25.6°C, 46 – 47% Relative Humidity (RH))
Neutralization Method(s):	N/A

Study Dates

Experimental Start Date/Time:	21MAY2020 / 1615
Experimental Termination Date/Time:	29MAY2020 / 0938
Study Completion Date:	04JUN2020

TEST PROCEDURE

Summary

- Stock virus was thawed and was not supplemented with an organic soil load.
- Sterile glass Petri dish carriers (100 x 15 mm) were inoculated with a volume of virus suspension. A sufficient number of test and control carriers were prepared.
- Inoculated carriers were dried at room temperature under laminar flow conditions.
- The test device was prepared according to the Study Sponsor's instructions as requested, and applied to the test carriers.
- The control carrier was held covered for the contact time then harvested in the same manner as the test.
- The viral suspensions were quantified to determine the levels of infectious virus using standard cell culture (e.g. $TCID_{50}$) or plaque assay techniques.
- Assay trays/plates were incubated for the period most suitable for the virus-host cell system (e.g. 7 days).
- After the incubation period, the assay was scored for the presence/absence of test virus. The appropriate calculations were performed (e.g. Spearman-Karber) to determine viral titers.
- Log_{10} and percent reductions were calculated for viral films exposed to the test product relative to the titer obtained for the study control carrier(s), and reported to the Study Sponsor.

SUCCESS CRITERIA

The following measures are met to ensure the acceptability of virucidal efficacy data:

- A minimum of 4.80 $\log_{10}$ infective units/control carrier is recovered from each plate recovery control film(s).
- The virus titer control demonstrate obvious and or typical cytopathic effects on the monolayers unless a detection method other than cytopathic effect is used.
- Quantification of the test and control parameters are conducted at a minimum of four determinations per dilution.

The product performance criteria follows:

- In the presence or absence of cytotoxicity, the product should demonstrate a ≥3.00 $\log_{10}$ reduction in viral titer on each surface.
- If cytotoxicity is present, the virus control titer should be increased if necessary to demonstrate a ≥3.00 $\log_{10}$ reduction in viral titer on each surface beyond the cytotoxicity level.

CALCULATIONS AND STATISTICAL ANALYSIS

The $TCID_{50}$ (Tissue Culture Infectivity Dose) represents the endpoint dilution where 50% of the cell cultures exhibit cytopathic effects due to infection by the test virus. The endpoint dilution at which 50% of the host cell monolayers exhibit cytotoxicity is termed the Tissue Culture Dose (TCD_{50}). The $TCID_{50}$, and TCD_{50} was determined using the Spearman-Kärber method and calculated as follows:

Negative logarithm of endpoint titer =

|– Log of first dilution inoculated| – |((sum of % mortality at each dilution/100) – 0.5) x Logarithm of dilution|

The result of this calculation is expressed as $TCID_{50}$/0.1 ml (or volume of dilution inoculated) for the test, virus control, and neutralization control and TCD_{50}/0.1 ml (or volume of dilution inoculated) for the cytotoxicity control.

Calculation of the Log Reduction

The log reduction in viral titer was calculated as follows:

Plate Recovery Control Log_{10} $TCID_{50}$ – Virus-Test Substance Log_{10} $TCID_{50}$

Calculation of the Percent Reduction

The percent reduction in viral titer was calculated as follows:

Percent Reduction = 1- (C/B) x 100, where:
B = Average $TCID_{50}$ of virus in control suspensions.
C = Average $TCID_{50}$ of virus in virus-test suspensions.

The presence of any test substance cytotoxicity were taken into account when calculating the log and percent reductions in viral titer.

If multiple virus control and test replicates were performed, the average $TCID_{50}$ of each parameter was calculated and the average result used to calculate the log reductions in viral titer.

RESULTS

Table 1: Virus Titer and Virus Plate Recovery Control Results

		Virus Titer	Virus Plate Recovery Control Time Zero	Virus Plate Recovery Control 30 minutes	Virus Plate Recovery Control 60 minutes	Virus Plate Recovery Control 120 minutes
Cell Control		0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0
Dilution	10^{-1}	+ + + +	+ + + +	+ + + +	+ + + +	+ + + +
	10^{-2}	+ + + +	+ + + +	+ + + +	+ + + +	+ + + +
	10^{-3}	+ + + +	+ + + +	+ + + +	+ + + +	+ + 0 +
	10^{-4}	+ + + +	+ + + 0	+ 0 0 0	0 0 0 0	0 0 0 0
	10^{-5}	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0
	10^{-6}	0 0 0 0	N/A	N/A	N/A	N/A
$TCID_{50}$ per 0.1 ml		4.50	4.25	3.75 Log_{10}	3.50 Log_{10}	3.25 Log_{10}
$TCID_{50}$ per Carrier		4.80	4.55	4.05 Log_{10}	3.80 Log_{10}	3.55 Log_{10}

Key: + = Virus recovered; 0 = Virus not recovered and/or no cytotoxicity observed;
T = Cytotoxicity observed

Table 3: Test Results at 60 minutes

		Test Results Replicate 1 60 minutes	Test Results Replicate 2 60 minutes	Test Results Replicate 3 60 minutes
Cell Control		0 0 0 0	0 0 0 0	0 0 0 0
Dilution	10^{-1}	0 0 0 0	0 0 0 0	0 0 0 0
	10^{-2}	0 0 0 0	0 0 0 0	0 0 0 0
	10^{-3}	0 0 0 0	0 0 0 0	0 0 0 0
	10^{-4}	0 0 0 0	0 0 0 0	0 0 0 0
	10^{-5}	0 0 0 0	0 0 0 0	0 0 0 0
$TCID_{50}$ per 0.1 ml		≤ 0.50 Log_{10}	≤ 0.50 Log_{10}	≤ 0.50 Log_{10}
$TCID_{50}$ per Carrier		≤ 0.80 Log_{10}	≤ 0.80 Log_{10}	≤ 0.80 Log_{10}
Average Log_{10} Reduction		2.70 Log_{10}		
Average Percent Reduction		99.90%		

Key: + = Virus recovered; 0 = Virus not recovered and/or no cytotoxicity observed;
T = Cytotoxicity observed; [†] *Taking cytotoxicity and neutralization controls into account.*

Table 4: Test Results at 120 minutes

		Test Results Replicate 1 120 minutes	Test Results Replicate 2 120 minutes	Test Results Replicate 3 120 minutes
Cell Control		0 0 0 0	0 0 0 0	0 0 0 0
Dilution	10^{-1}	0 0 0 0	0 0 0 0	0 0 0 +
	10^{-2}	0 0 0 0	0 0 0 0	0 0 0 0
	10^{-3}	0 0 0 0	0 0 0 0	0 0 0 0
	10^{-4}	0 0 0 0	0 0 0 0	0 0 0 0
	10^{-5}	0 0 0 0	0 0 0 0	0 0 0 0
$TCID_{50}$ per 0.1 ml		≤ 0.50 Log_{10}	≤ 0.50 Log_{10}	0.75 Log_{10}
$TCID_{50}$ per Carrier		≤ 0.80 Log_{10}	≤ 0.80 Log_{10}	1.05 Log_{10}
Average Log_{10} Reduction		2.37 Log_{10}		
Average Percent Reduction		99.79%		

Key: + = Virus recovered; 0 = Virus not recovered and/or no cytotoxicity observed;
T = Cytotoxicity observed; [†] *Taking cytotoxicity and neutralization controls into account.*

STUDY CONCLUSION

The purpose of the study was to determine the virucidal efficacy of AtmosAir Matterhorn Series device against Human Coronavirus Strain 229E, with no additional soil load incorporated into inoculum, at contact times of 30 minutes, 60 minutes, and 120 minutes, and at an exposure temperature of 25.2 – 25.6°C, 46 – 47% RH.

At 30 minutes, the Plate Recovery Control demonstrated a viral titer of 3.75 Log_{10} $TCID_{50}$ per 0.1 ml and 4.05 Log_{10} $TCID_{50}$ per carrier. The evaluated test device, AtmosAir Matterhorn Series, demonstrated an average 2.78 Log_{10} reduction (99.92%) in viral titer.

At 60 minutes, the Plate Recovery Control demonstrated a viral titer of 3.50 Log_{10} $TCID_{50}$ per 0.1 ml and 3.80 Log_{10} $TCID_{50}$ per carrier. The evaluated test device, AtmosAir Matterhorn Series, demonstrated an average 2.70 Log_{10} reduction (99.90%) in viral titer.

At 120 minutes, the Plate Recovery Control demonstrated a viral titer of 3.25 Log_{10} $TCID_{50}$ per 0.1 ml and 3.55 Log_{10} $TCID_{50}$ per carrier. The evaluated test device, AtmosAir Matterhorn Series, demonstrated an average 2.37 Log_{10} reduction (99.79%) in viral titer.

Note:
As an enveloped virus, Human Coronavirus 229E is susceptible to inactivation during periods of prolonged drying. Drying times past 1 hour can result in decreased viral recovery due to natural inactviation.

The test substance will be disposed of 30 days after the completion of this study, unless otherwise requested by the Study Sponsor.

The results of this study apply to the tested substances(s) only. Extrapolation of findings to related materials is the responsibility of the Sponsor.