

AIRPHX Independent Testing

December, 2022

The efficacy of AIRPHX technology in addressing pathogen control has been tested (i) by independent third parties in laboratories, (ii) by independent third parties in field installations, (iii) by hospitals in connection with their tracking of hospital-acquired infections, and (iv) by a number of other independent entities, including governmental agencies. The efficacy of AIRPHX technology in addressing volatile organic compounds (VOCs) has been tested by an independent third party laboratory.

1. Laboratory Testing

AIRPHX retained Scientific Air Solutions, an independent bio-safety level 2 laboratory, to conduct laboratory testing on over 30 actual pathogens (not surrogates), including bacteria, virus, fungi and protozoa. The complete list of tested pathogens is set forth below.

Two biosafety chambers (one experimental and one control) were used to isolate coupons that were placed inside a petri dish during the exposure of the surfaces to AIRPHX oxidizing molecules. The surfaces evaluated were surgical stainless steel, polyvinyl chloride and vinyl composition tile. Inside the experimental chamber, temperature and relative humidity were monitored constantly, with target temperature between 25-27°C and relative humidity between 50-80%.

A set of three random coupons per organism were tested immediately (0 hour) to determine the attachment level to the selected surfaces. In addition, four sets of three coupons per organism (randomly selected) were placed inside the experimental chamber at a 30° angle.

The twelve coupons per organism placed inside the experimental chamber were continuously treated with AIRPHX oxidizing molecules for 0.5, 1, 2, 4, 6, 8, 12 and 24 hours. Each chamber was allowed to stabilize at desired oxidizing molecule level, relative humidity and temperature levels prior to introducing the coupons. Oxidizing molecule levels were continuously monitored for oxidizing molecules in one minute intervals with Drager tubes (for hydrogen peroxide) and an AeroQual Series 500 handheld ozone tester with a 0.050 parts per million sensor (for ozone) prior to removing coupons for microbiological testing.¹

The twelve remaining coupons (controls) per organism were placed in a control chamber and held at environmental conditions to determine the natural decay of microbial populations over time. After removing the coupons, the chambers were allowed to re-stabilize at target levels of experimental parameters to minimize experimental variability in the chamber environment.

¹ The negligible levels of ozone produced by AIRPHX provide little, if any, disinfection in the treatment space. Gas phase hydrogen peroxide is an excellent disinfecting agent with a very long half life. The National Institute of Health confirms the efficacy of hydrogen peroxide: "Although nonflammable, [hydrogen peroxide] is a powerful oxidizing agent that can cause spontaneous combustion when it comes in contact with organic material." <https://pubchem.ncbi.nlm.nih.gov/compound/Hydrogen-peroxide>. Current versions of AIRPHX CID 75k units and AIRPHX in-duct units are as effective at addressing air and surface pathogens as prior versions and comply with California Air Resources Board (CARB) stringent ozone emissions standards, with the in-duct units complying with UL 2998 as being "ozone free."

Air and Surface Infection Control

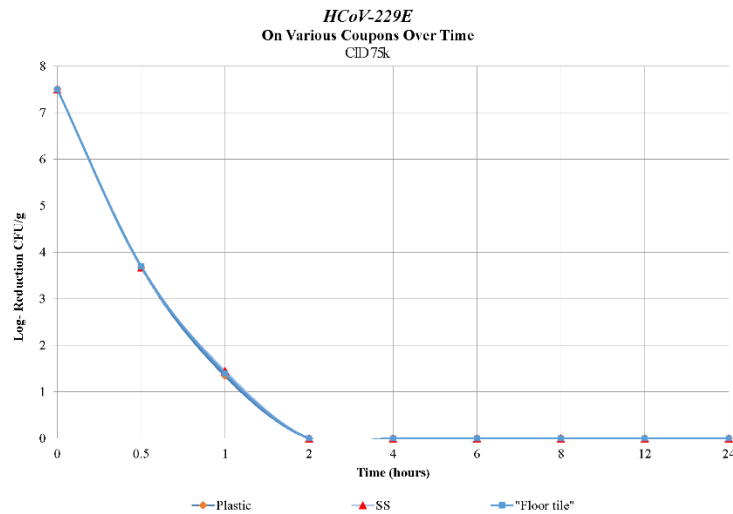
Samples (inoculated and controls) were aseptically collected for microbiological analysis at designated times (0.5, 1, 2, 4, 6, 8, 12 and 24 hours) after completion of the treatment process. Coupons by organism were individually placed inside a sterile centrifuge tube with 15 ml of 0.1% peptone and vortexed for 2 minutes. Serial dilutions (0-5) were made and 0.1 ml spread plated onto duplicate pour plates. Plates were incubated at the respective temperature and time for each organism. Populations were calculated and reported as Log₁₀ CFU/coupon. Reductions were calculated by obtaining the difference between populations recovered on the selective agar at each exposure time and the initial attachment level of the inoculum.

Independent laboratory testing of AIRPHX technology was conducted on the pathogens identified below. AIRPHX technology proved to be remarkably consistent in achieving dramatic reductions of pathogens in short periods of time. See [Exhibit I](#) for representative testing.

Bacteria	Virus	Protozoa/Other
Acinetobacter baumannii	Coronavirus	Blastocystis hominis
Bacteroides fragilis	Hepatitis A	Candida auris
Burkholderia cepacia	Hepatitis B	Cryptosporidium parvum
Carbapenem-resistant	Hepatitis C	Cyclospora cayetanensis
Clostridium difficile	H1N1	Entamoeba histolytic
Clostridium sordellii	Influenza A	Geobacillus
Enterococcus faecalis	Norovirus	Giardia lamblia
Escherichia coli	Rhinovirus	Toxoplasma gondii
Escherichia coli O157:H7		
Klebsiella pneumoniae		
Listeria monocytogenes		
Methicillin-resistant Staphylococcus aureus		
Mycobacterium abscessus		
Pseudomonas aeruginosa		
Salmonella spp		
Staphylococcus aureus		
Vancomycin-resistant Staphylococcus aureus		
Vancomycin-resistant Enterococci		

Scientific Air Solutions was able to test AIRPHX technology against HCoV-229E, a genetic match with SARS-CoV-2. Testing was conducted in a test chamber, with the surface coupons inoculated with the virus. After being exposed to the AIRPHX device using the protocols described above, there was an approximate 3.7-log reduction in organisms in 30 minutes (a 4-log reduction is 10,000 organisms down to 1) with the virus being rendered completely inactive in two hours by destroying the virus at the cellular level (as a result of which the virus is incapable of becoming active again). This was not surprising because it is completely consistent with independent laboratory testing conducted on a number of other viruses, including influenza, norovirus, rhinovirus, hepatitis A, B and C, and H1N1.

Actual testing on HCoV-229E is set forth below.



2. Field Testing

AIRPHX prides itself on living outside the laboratory, so AIRPHX has over 75 independent testing results on actual field installations. An independent laboratory tested for both airborne and surface organisms. Testing was conducted across a broad range of location types including commercial gyms, college sports programs, hospital and healthcare, hotels, casinos, government buildings and commercial offices. These locations varied in size, facility layout, bioburden and indoor air quality prior to treatment of the space by AIRPHX.ⁱ²

Air Testing. Air sampling entailed drawing 30 liters of air per sample using a MicroBio MB1 volumetric air sampler. Air samples were impinged on 15x100 mm potato dextrose agar plates. Air sample morphology and enumeration was completed by Scientific Air Solutions. Recorded results are normalized to colony-forming units per cubic meter of air, or CFU/m³. The reports indicate the predominant organisms identified in the testing, which are generally mold/fungi, because they are typically the most prevalent in outdoor (fresh) air. Provision of “fresh” outside air into treatment spaces (as is currently advocated by the CDC) has the effect of continuously introducing these organisms into treatment spaces. There are many other organisms in the air in the treatment space, including harmful bacteria and viruses like the coronavirus.

Surface Testing. A uniform six inch-by-six inch square surface was swabbed for each sample, with swab sponges forwarded to Scientific Air Solutions for enumeration. All swab samples were examined for the number of organisms and recorded as colony forming units per square centimeter, or CFU/cm². The reports do not identify the predominant organisms in the surface samples, in part because the sponge medium is consumed in the culture process. AIRPHX has been advised by Scientific Air Solutions that the predominant organisms on surfaces likely are similar to those found in the air.

² AIRPHX has continually made improvements to its technology to reduce levels of ozone emitted by the units without reducing their efficacy. The test results reflect testing obtained from a variety of AIRPHX installations.

Again there are many other organisms on surfaces in the treatment space, including harmful bacteria and viruses like the coronavirus.

Treatment. Sample locations were mapped and noted as either air sampling or surface swabbing. Upon completion of pre-treatment sampling, one or more AIRPHX PA2400 units (or in some cases an AIRPHX CID 75k) was placed in the treatment area and activated. The AIRPHX unit was generally allowed to operate continuously for the duration of the test period (which was typically at least several weeks). At the end of the treatment period, in-treatment volumetric air samples and surface swabbing were taken in the same locations as the pre-treatment sampling. External air samples were taken to understand the influence of the supplied air to the test locations.

Predominant Microorganisms; Effect on Other Organisms. Currently, many people are concerned above the existence of harmful bacteria and viruses in their facilities, workplaces and residences. AIRPHX technology produces oxidizing molecules that are excellent disinfecting agents against a wide range of pathogens. Laboratory testing on a variety of pathogens confirms the efficacy (time to effectiveness and percentage of reduction) of AIRPHX technology across a broad spectrum of pathogens, including (in descending order of difficulty with geobacillus the most difficult) geobacillus, protozoa, mold spores, fungi, bacteria and viruses. Because AIRPHX technology is indiscriminate in its destruction (or rendering inactive) of pathogens, Scientific Air Solutions has advised AIRPHX that testing showing reductions of the predominant organisms supports the conclusion that AIRPHX technology is reducing similar or larger percentages of harmful bacteria and viruses in the treatment space, both in the air and on surfaces.

Target Levels of Organisms. Air quality scale for workplaces, public buildings, schools and homes are as follows: (i) less than 100 cfu/m³ is considered clean and acceptable; (ii) 100 to 300 cfu/m³ is marginal; and (iii) more than 300 cfu/m³ is not acceptable and needs corrective action. Contact surface quality scale for workplaces, public buildings, schools and homes are as follows: (i) less than 5 cfu/cm² is considered clean and acceptable; (ii) 5 to 10 cfu/cm² is considered marginal; and (iii) more than 10 cfu/cm² is considered not acceptable and needs corrective action.

Efficacy. When AIRPHX technology was deployed in occupied spaces consistent with proper usage as set forth in the user manual, the airborne organisms were reduced on average by 90+% and the surface organisms were reduced on average by 95+%. Those results generally rendered the treatment space “clean and acceptable”.

Exhibit II summarizes independent laboratory results for third party field tests in occupied spaces.

3. Hospitals/Healthcare Facilities

AIRPHX technology has been deployed in a number of hospitals and other healthcare facilities, including in areas of those facilities where the most immune-compromised patient populations reside, such as cancer wings, transplant wings, intensive care units and neo-natal ICUs. AIRPHX is generally not provided hospital-generated healthcare associated infection (HAI) information due to confidentiality concerns. However, there is a lot of anecdotal experience shared with us by hospitals, physicians and staff. Exhibit III contains two charts shared by hospital customers with AIRPHX related to actual experience with HAIs after deploying AIRPHX. The first chart shows reductions in central line infections

after deployment of AIRPHX technology on the transplant floor of a 450 head tertiary-care hospital in the mid-Atlantic region. The next three charts show reductions in clostridium difficile cases in three specialty hospitals with long-term chronic care patients. Anecdotal evidence includes a 75% reduction in candida auris infections at one of these specialty hospitals.

4. Other Testing and Reports

A number of government entities have over the years tested AIRPHX technology (principally when the technology was deployed by another company). Those government reports focused on food applications, where the government testing confirmed reduction of food borne pathogens and extension of shelf-life for foods. The government testing is listed below and reports are available upon request.

- Improving Quality and Shelf-Life of Fruits Using Reactive Oxygen Species Technology (ROS), Dr. Yaguang Luo, Ph.D., Produce Quality and Safety Lab USDA ARS
- Environmental Management System: Surface and Air Sanitation for Food Quality and Safety: Review and Efficacy for the Meat Industry, Sherry D. Clarke, Ph.D., June 2009
- Davis Fresh Technologies – AirOcare – Sweet Darling Project (Strawberries), May 26, 2005
- AIRPHX units have been verified by the Washington State Department of Agriculture to comply with USDA National Organic Standards (7 CFR Part 205)

5. VOC Testing

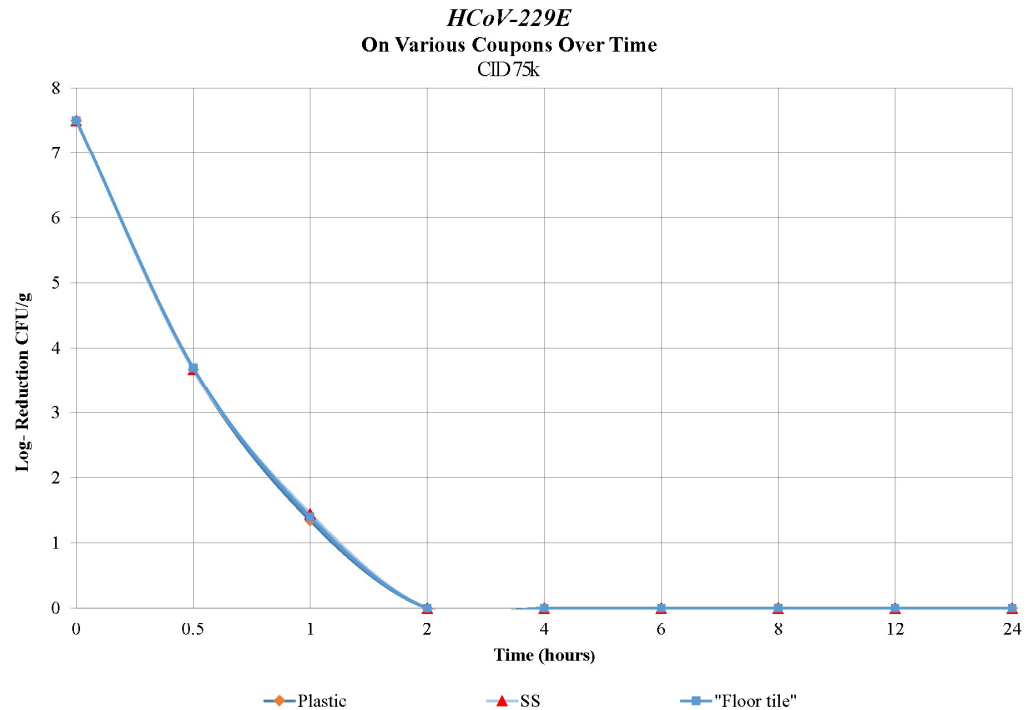
Eurofins, EAG Laboratories used a Solid Phase Microextraction Gas Chromatography with Mass Spectrometry (SPME-GC/MS) to compare air samples for a “control” sample and “test” sample where the “test” air had been exposed to AIRPHX for 90 minutes. Both the “control” and the “test” sample contained air drawn from a 1,200 cubic foot test chamber. The “test” sample was found to contain significantly lower quantities of the only VOCs that were found to exist in significant quantities in the “control” sample (1-propanol and 1-butanol), whereas the remaining VOCs in each sample were not significantly different. EAG Laboratories found that components unique to either the “control” or the “test” sample were low in intensity. This independent testing confirms that (i) AIRPHX significantly reduced all VOCs that existed in significant quantities in the “control” sample and (ii) AIRPHX does not create any VOCs.

Effects of Advanced Oxidation Technology on *Human Coronavirus HCoV-229E* on Various Surfaces* HCoV-229E has the same genetics as SARS-CoV-2 (COVID-19)

CID 75k				
<i>Human Coronavirus 229E</i>				
Time	Plastic			Reduction
	CFU	Log	SD	
0	32,000,000	7.51	0.4	-
0.5	4,700	3.67	0.2	3.84
1	22	1.34	0.1	6.17
2	<1	0.00	0.1	7.51
4	<1	0.00	0.1	7.51
6	<1	0.00	0.1	7.51
8	<1	0.00	0.1	7.51
12	<1	0.00	0.1	7.51
24	<1	0.00	0.1	7.51

CID 75k				
<i>Human Coronavirus 229E</i>				
Time	Stainless Steel			Reduction
	CFU	Log	SD	
0	32,000,000	7.51	0.3	-
0.5	4,700	3.67	0.3	3.84
1	28	1.45	0.2	6.06
2	<1	0.00	0.1	7.51
4	<1	0.00	0.1	7.51
6	<1	0.00	0.1	7.51
8	<1	0.00	0.1	7.51
12	<1	0.00	0.1	7.51
24	<1	0.00	0.1	7.51

CID 75k				
<i>Human Coronavirus 229E</i>				
Time	Floor Tile			Reduction
	CFU	Log	SD	
0	32,000,000	7.51	0.2	-
0.5	5,000	3.70	0.3	3.81
1	25	1.40	0.2	6.11
2	<1	0.00	0.1	7.51
4	<1	0.00	0.1	7.51
6	<1	0.00	0.1	7.51
8	<1	0.00	0.1	7.51
12	<1	0.00	0.1	7.51
24	<1	0.00	0.1	7.51



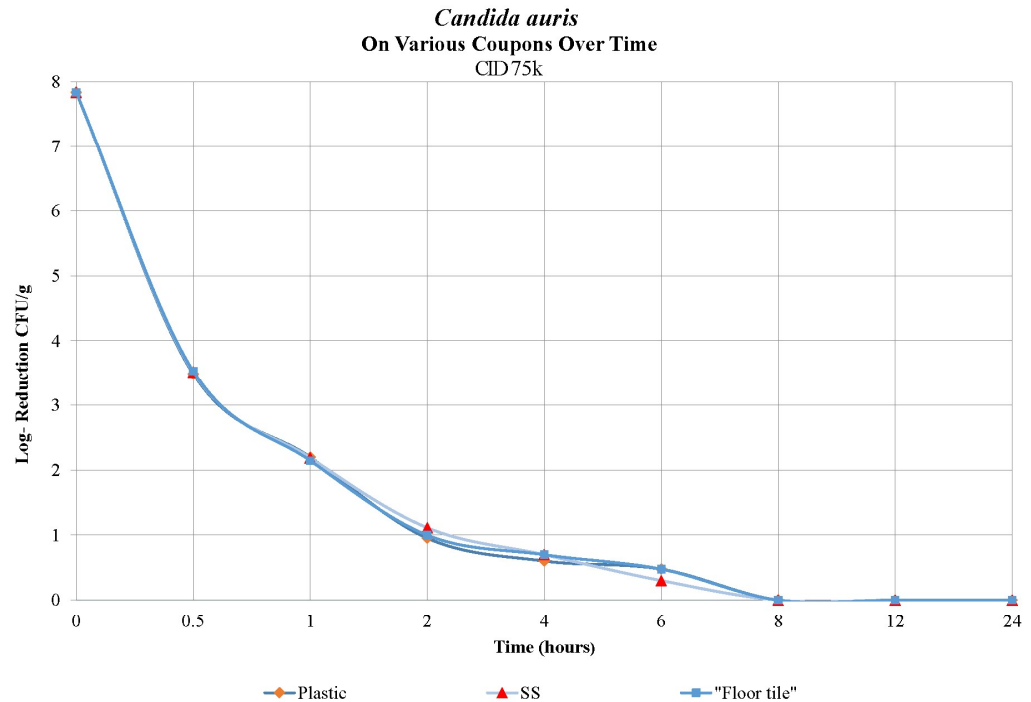
* Tests conducted by Scientific Air Solutions, a Biosafety Level 2 facility, in a test chamber (6' x 4' x 10') by exposing coupons inoculated with indicated organism – reflects actual virus and reductions over time. Advanced oxidation system developed by airPHX company.
HCoV-229E shares the same genetic material as SARS-CoV-2.

Effects of Advanced Oxidation Technology on Emerging Fungus *Candida auris* on Various Surfaces*

CID 75k				
Time	<i>Candida auris</i>			Reduction
	Plastic			
	CFU	Log	SD	
0	69,000,000	7.84	0.3	-
0.5	3,100	3.49	0.2	4.35
1	158	2.20	0.2	5.64
2	9	0.95	0.2	6.89
4	4	0.60	0.1	7.24
6	3	0.48	0.1	7.36
8	<1	0.00	0.1	7.84
12	<1	0.00	0.1	7.84
24	<1	0.00	0.1	7.84

CID 75k				
Time	<i>Candida auris</i>			Reduction
	Stainless Steel			
	CFU	Log	SD	
0	69,000,000	7.84	0.4	-
0.5	3,300	3.52	0.2	4.32
1	155	2.19	0.3	5.65
2	13	1.11	0.2	6.73
4	5	0.70	0.1	7.14
6	2	0.30	0.1	7.54
8	<1	0.00	0.1	7.84
12	<1	0.00	0.1	7.84
24	<1	0.00	0.1	7.84

CID 75k				
Time	<i>Candida auris</i>			Reduction
	Floor Tile			
	CFU	Log	SD	
0	69,000,000	7.84	0.3	-
0.5	3,400	3.53	0.2	4.31
1	140	2.15	0.2	5.69
2	10	1.00	0.2	6.84
4	5	0.70	0.1	7.14
6	3	0.48	0.1	7.36
8	<1	0.00	0.1	7.84
12	<1	0.00	0.1	7.84
24	<1	0.00	0.1	7.84



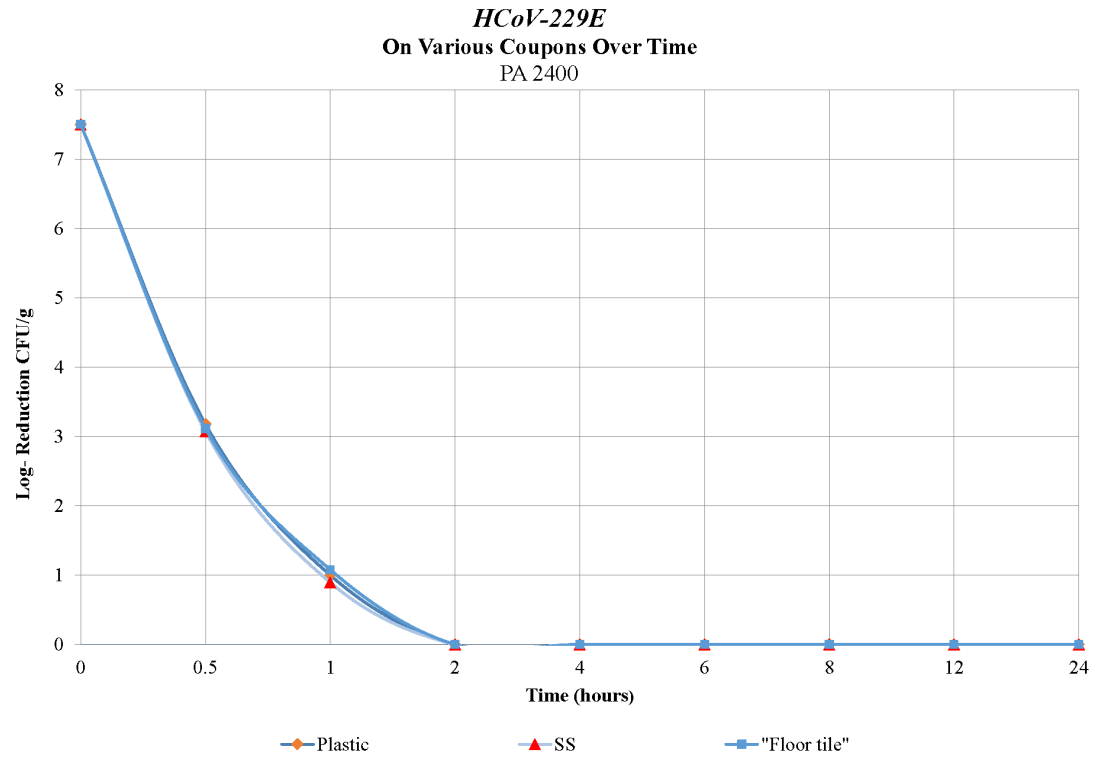
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Effects of Advanced Oxidation Technology on *Human Coronavirus HCoV-229E* on Various Surfaces* HCoV-229E has the same genetics as SARS-CoV-2 (COVID-19)

PA 2400				
Time	<i>Human Coronavirus 229E</i>			Reduction
	Plastic			
	CFU	Log	SD	
0	32,000,000	7.51	0.3	-
0.5	1,510	3.18	0.2	4.33
1	10	1.00	0.2	6.51
2	<1	0.00	0.1	7.51
4	<1	0.00	0.1	7.51
6	<1	0.00	0.1	7.51
8	<1	0.00	0.2	7.51
12	<1	0.00	0.1	7.51
24	<1	0.00	0.1	7.51

PA 2400				
Time	<i>Human Coronavirus 229E</i>			Reduction
	Stainless Steel			
	CFU	Log	SD	
0	32,000,000	7.51	0.2	-
0.5	1,210	3.08	0.3	4.43
1	8	0.90	0.2	6.61
2	<1	0.00	0.1	7.51
4	<1	0.00	0.1	7.51
6	<1	0.00	0.1	7.51
8	<1	0.00	0.1	7.51
12	<1	0.00	0.1	7.51
24	<1	0.00	0.1	7.51

PA 2400				
Time	<i>Human Coronavirus 229E</i>			Reduction
	Floor Tile			
	CFU	Log	SD	
0	32,000,000	7.51	0.4	-
0.5	1,310	3.12	0.3	4.39
1	12	1.08	0.3	6.43
2	<1	0.00	0.1	7.51
4	<1	0.00	0.1	7.51
6	<1	0.00	0.1	7.51
8	<1	0.00	0.1	7.51
12	<1	0.00	0.1	7.51
24	<1	0.00	0.1	7.51



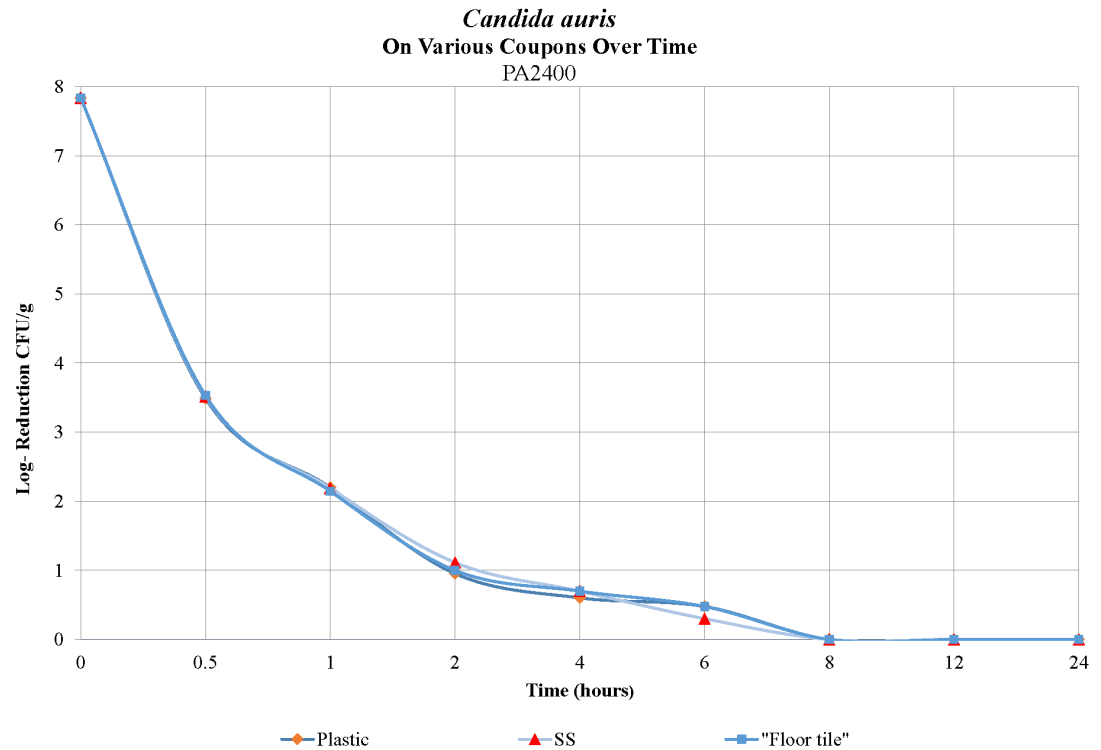
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HCoV-229E shares the same genetic material as SARS-CoV-2.

Effects of Advanced Oxidation Technology on Emerging Fungus *Candida auris* on Various Surfaces*

PA 2400				
Time	<i>Candida auris</i>			Reduction
	Plastic			
	CFU	Log	SD	
0	69,000,000	7.84	0.3	-
0.5	2,100	3.32	0.2	4.52
1	85	1.93	0.3	5.91
2	5	0.70	0.2	7.14
4	3	0.48	0.2	7.36
6	<1	0.00	0.1	7.84
8	<1	0.00	0.1	7.84
12	<1	0.00	0.1	7.84
24	<1	0.00	0.1	7.84

PA 2400				
Time	<i>Candida auris</i>			Reduction
	Stainless Steel			
	CFU	Log	SD	
0	69,000,000	7.84	0.4	-
0.5	2,300	3.36	0.2	4.48
1	70	1.85	0.2	5.99
2	9	0.95	0.2	6.89
4	3	0.48	0.3	7.36
6	<1	0.00	0.1	7.84
8	<1	0.00	0.1	7.84
12	<1	0.00	0.1	7.84
24	<1	0.00	0.1	7.84

PA 2400				
Time	<i>Candida auris</i>			Reduction
	Floor Tile			
	CFU	Log	SD	
0	69,000,000	7.84	0.3	-
0.5	2,200	3.34	0.2	4.50
1	93	1.97	0.3	5.87
2	6	0.78	0.2	7.06
4	4	0.60	0.2	7.24
6	<1	0.00	0.1	7.84
8	<1	0.00	0.1	7.84
12	<1	0.00	0.1	7.84
24	<1	0.00	0.1	7.84



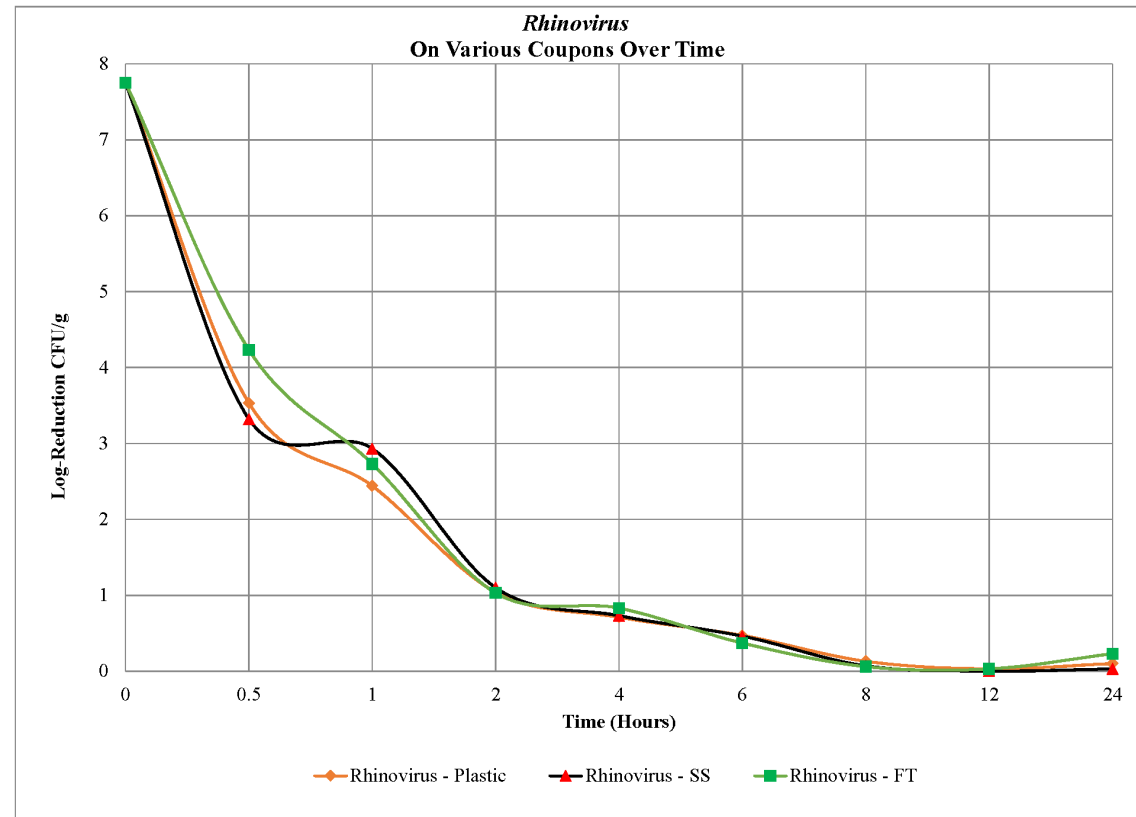
* Tests conducted by Scientific Air Solutions, a Biosafety Level 2 facility, in a test chamber (6' x 4' x 10') by exposing coupon inoculated with indicated organism – reflects actual pathogens (not surrogates) and reductions in organisms over time. Advanced oxidation system developed by airPHX company.

Effects of Advanced Oxidation Technology on *Rhinovirus* on Various Surfaces*

Time	Rhinovirus			Reduction
	Plastic			
	CFU	Log	SD	
0	56,234,133	7.58	0.2	7.75
0.5	3,388	4.05	0.2	3.53
1	275	5.14	0.3	2.44
2	11	6.54	0.2	1.04
4	5	6.87	0.2	0.71
6	3	7.11	0.1	0.47
8	1	7.45	0.2	0.13
12	1	7.55	0.3	0.03
24	1	7.48	0.2	0.10

Time	Rhinovirus			Reduction
	Stainless Steel			
	CFU	Log	SD	
0	56,234,133	7.58	0.2	7.75
0.5	2,089	3.72	0.2	3.32
1	851	4.65	0.3	2.93
2	13	6.48	0.2	1.10
4	5	6.85	0.2	0.73
6	3	7.12	0.1	0.46
8	1	7.51	0.2	0.07
12	1	7.58	0.3	0.00
24	1	7.55	0.2	0.03

Time	Rhinovirus			Reduction
	Floor Tile			
	CFU	Log	SD	
0	56,234,133	7.58	0.2	7.75
0.5	16,982	3.35	0.2	4.23
1	537	4.85	0.2	2.73
2	11	6.55	0.2	1.03
4	7	6.75	0.2	0.83
6	2	7.21	0.2	0.37
8	1	7.52	0.1	0.06
12	1	7.55	0.1	0.03
24	2	7.35	0.1	0.23



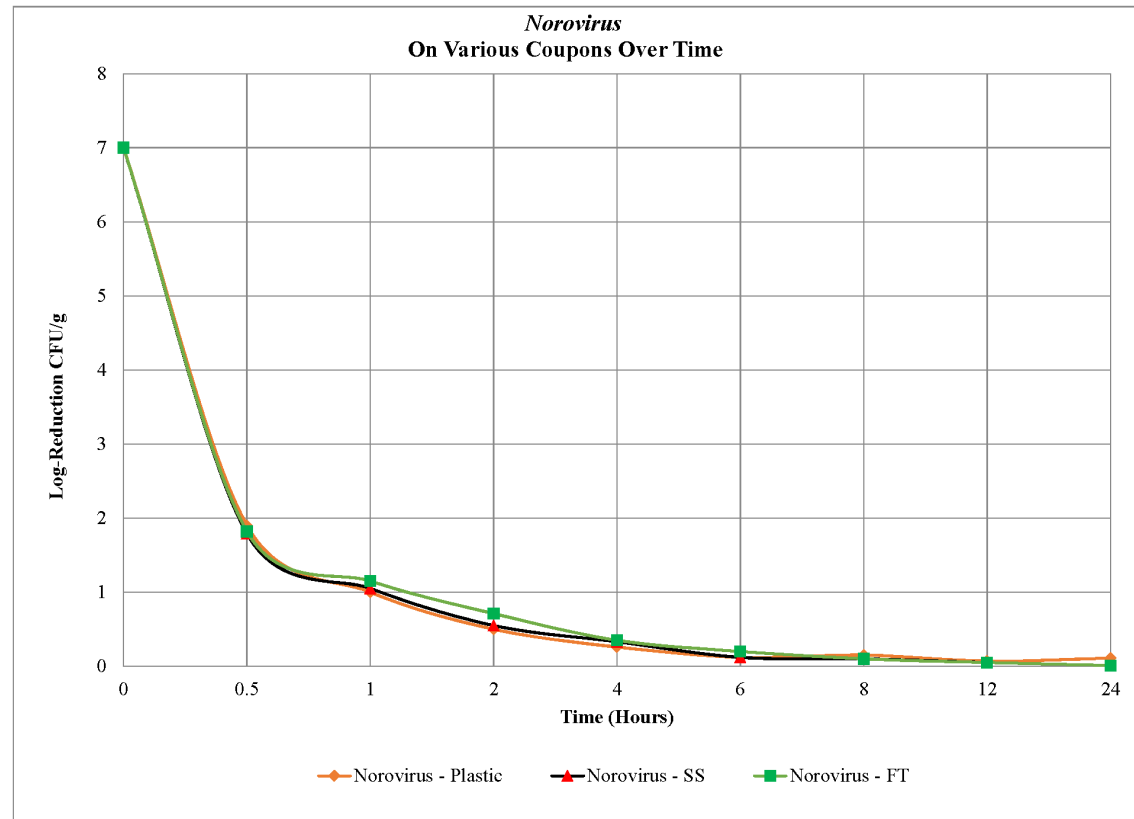
* Tests conducted by Scientific Air Solutions, Turlock, California, in a test chamber (6' x 4' x 10') by exposing coupon inoculated with indicated organism – reflects actual pathogens (not surrogates) and reductions in organisms over time. Advanced oxidation system developed by airPHX company.

Effects of Advanced Oxidation Technology on *Norovirus* on Various Surfaces*

Time	Norovirus Plastic			Reduction
	CFU	Log	SD	
0	10,000,000	7.00	0.2	7.00
0.5	79	5.10	0.2	1.90
1	10	6.00	0.3	1.00
2	3	6.50	0.2	0.50
4	2	6.74	0.2	0.26
6	1	6.88	0.1	0.12
8	1	6.85	0.2	0.15
12	1	6.93	0.3	0.07
24	1	6.89	0.2	0.11

Time	Norovirus Stainless Steel			Reduction
	CFU	Log	SD	
0	10,000,000	7.00	0.2	7.00
0.5	62	5.21	0.2	1.79
1	11	5.95	0.3	1.05
2	4	6.45	0.2	0.55
4	2	6.67	0.2	0.33
6	1	6.88	0.1	0.12
8	1	6.90	0.2	0.10
12	1	6.95	0.3	0.05
24	1	6.99	0.2	0.01

Time	Norovirus Floor Tile			Reduction
	CFU	Log	SD	
0	10,000,000	7.00	0.2	7.00
0.5	66	5.18	0.2	1.82
1	14	5.85	0.3	1.15
2	5	6.29	0.2	0.71
4	2	6.65	0.2	0.35
6	2	6.80	0.1	0.20
8	1	6.90	0.2	0.10
12	1	6.95	0.3	0.05
24	1	6.99	0.2	0.01



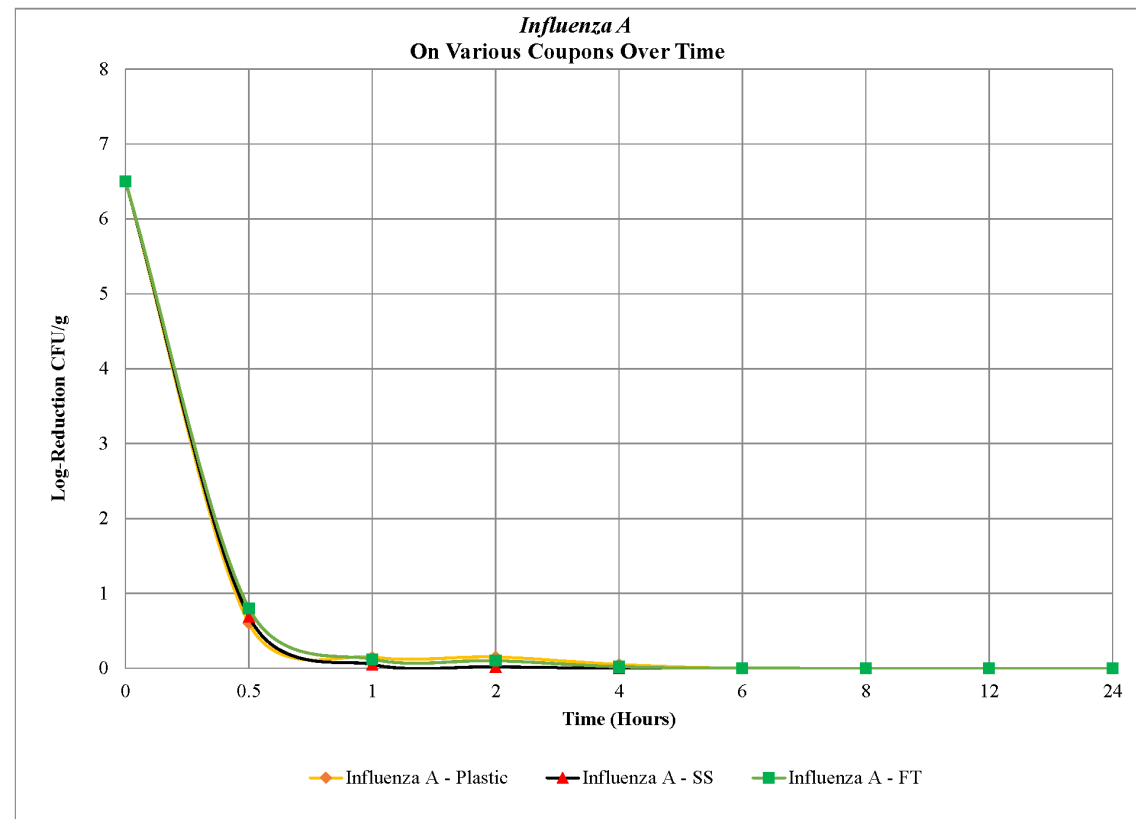
* Tests conducted by Scientific Air Solutions, Turlock, California, in a test chamber (6' x 4' x 10') by exposing coupon inoculated with indicated organism – reflects actual pathogens (not surrogates) and reductions in organisms over time. Advanced oxidation system developed by airPHX company.

Effects of Advanced Oxidation Technology on *Influenza A* on Various Surfaces*

Time	Influenza A			Reduction
	Plastic			
	CFU	Log	SD	
0	3,162,278	6.50	0.2	6.50
0.5	4	5.90	0.2	0.60
1	1	6.35	0.3	0.15
2	1	6.35	0.2	0.15
4	1	6.45	0.2	0.05
6	1	6.50	0.1	0.00
8	1	6.50	0.2	0.00
12	1	6.50	0.3	0.00
24	1	6.50	0.2	0.00

Time	Influenza A			Reduction
	Stainless Steel			
	CFU	Log	SD	
0	3,162,278	6.50	0.2	6.50
0.5	5	5.81	0.2	0.69
1	1	6.45	0.3	0.05
2	1	6.48	0.2	0.02
4	1	6.50	0.2	0.00
6	1	6.50	0.1	0.00
8	1	6.50	0.2	0.00
12	1	6.50	0.3	0.00
24	1	6.50	0.2	0.00

Time	Influenza A			Reduction
	Floor Tile			
	CFU	Log	SD	
0	3,162,278	6.50	0.2	6.50
0.5	6	5.70	0.2	0.80
1	1	6.38	0.3	0.12
2	1	6.40	0.2	0.10
4	1	6.48	0.2	0.02
6	1	6.50	0.1	0.00
8	1	6.50	0.2	0.00
12	1	6.50	0.3	0.00
24	1	6.50	0.2	0.00



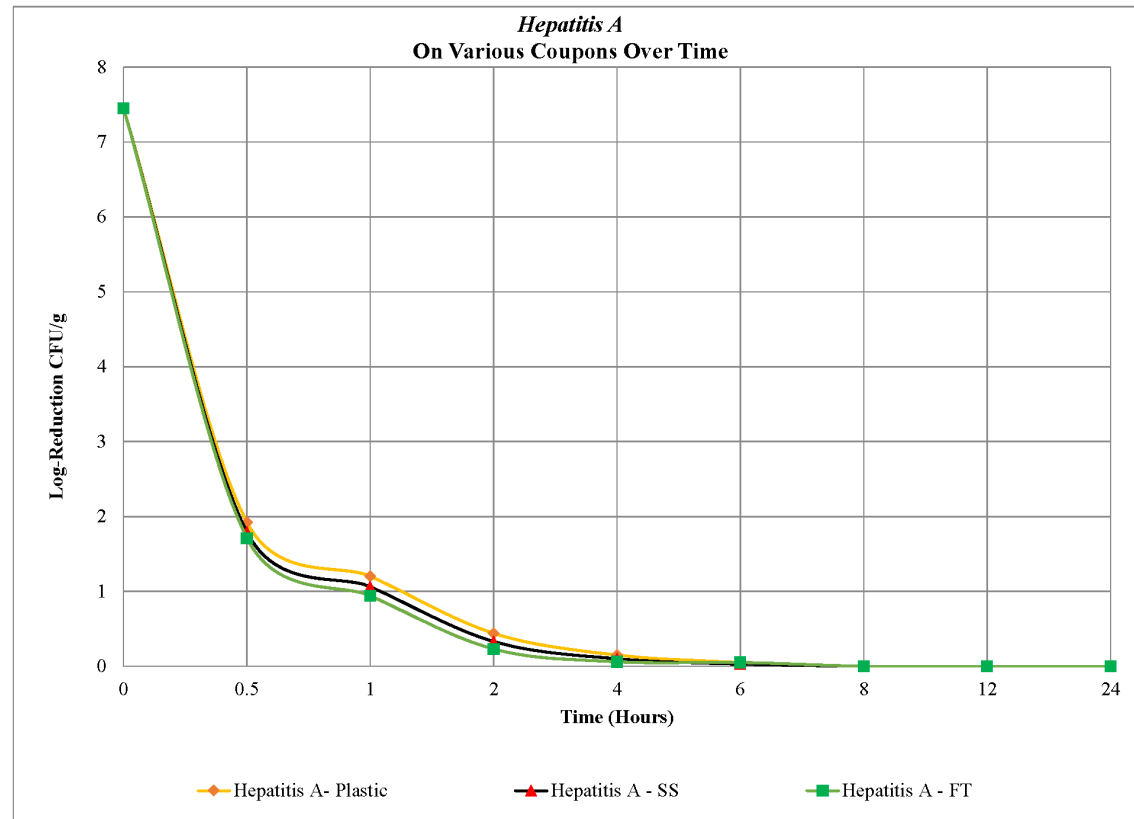
* Tests conducted by Scientific Air Solutions, Turlock, California, in a test chamber (6' x 4' x 10') by exposing coupon inoculated with indicated organism – reflects actual pathogens (not surrogates) and reductions in organisms over time. Advanced oxidation system developed by airPHX company.

Effects of Advanced Oxidation Technology on Hepatitis A on Various Surfaces*

Time	Hepatitis A Plastic			Reduction
	CFU	Log	SD	
0	28,183,829	7.45	0.2	7.45
0.5	83	5.53	0.2	1.92
1	16	6.25	0.3	1.20
2	3	7.01	0.2	0.44
4	1	7.30	0.2	0.15
6	1	7.40	0.1	0.05
8	1	7.45	0.2	0.00
12	1	7.45	0.3	0.00
24	1	7.45	0.2	0.00

Time	Hepatitis A Stainless Steel			Reduction
	CFU	Log	SD	
0	28,183,829	7.45	0.2	7.45
0.5	62	5.66	0.2	1.79
1	11	6.39	0.3	1.06
2	2	7.12	0.2	0.33
4	1	7.35	0.2	0.10
6	1	7.42	0.1	0.03
8	1	7.45	0.2	0.00
12	1	7.45	0.3	0.00
24	1	7.45	0.2	0.00

Time	Hepatitis A Floor Tile			Reduction
	CFU	Log	SD	
0	28,183,829	7.45	0.2	7.45
0.5	51	5.74	0.2	1.71
1	9	6.51	0.3	0.94
2	2	7.22	0.2	0.23
4	1	7.39	0.2	0.06
6	1	7.40	0.1	0.05
8	1	7.45	0.2	0.00
12	1	7.45	0.3	0.00
24	1	7.45	0.2	0.00



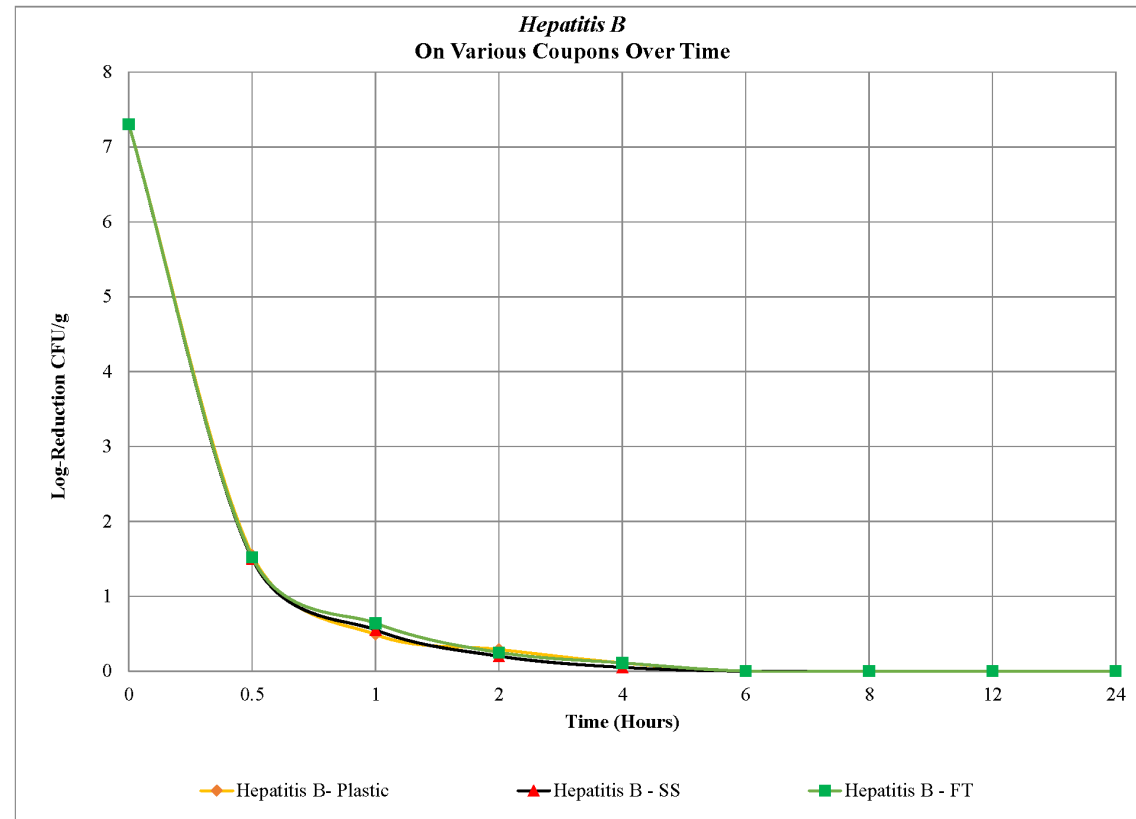
* Tests conducted by Scientific Air Solutions, Turlock, California, in a test chamber (6' x 4' x 10') by exposing coupon inoculated with indicated organism – reflects actual pathogens (not surrogates) and reductions in organisms over time. Advanced oxidation system developed by airPHX company.

Effects of Advanced Oxidation Technology on *Hepatitis B* on Various Surfaces*

Time	Hepatitis B Plastic			Reduction
	CFU	Log	SD	
0	19,952,623	7.30	0.2	7.30
0.5	35	5.75	0.2	1.55
1	3	6.81	0.3	0.49
2	2	7.01	0.2	0.29
4	1	7.19	0.2	0.11
6	1	7.30	0.1	0.00
8	1	7.30	0.2	0.00
12	1	7.30	0.3	0.00
24	1	7.30	0.2	0.00

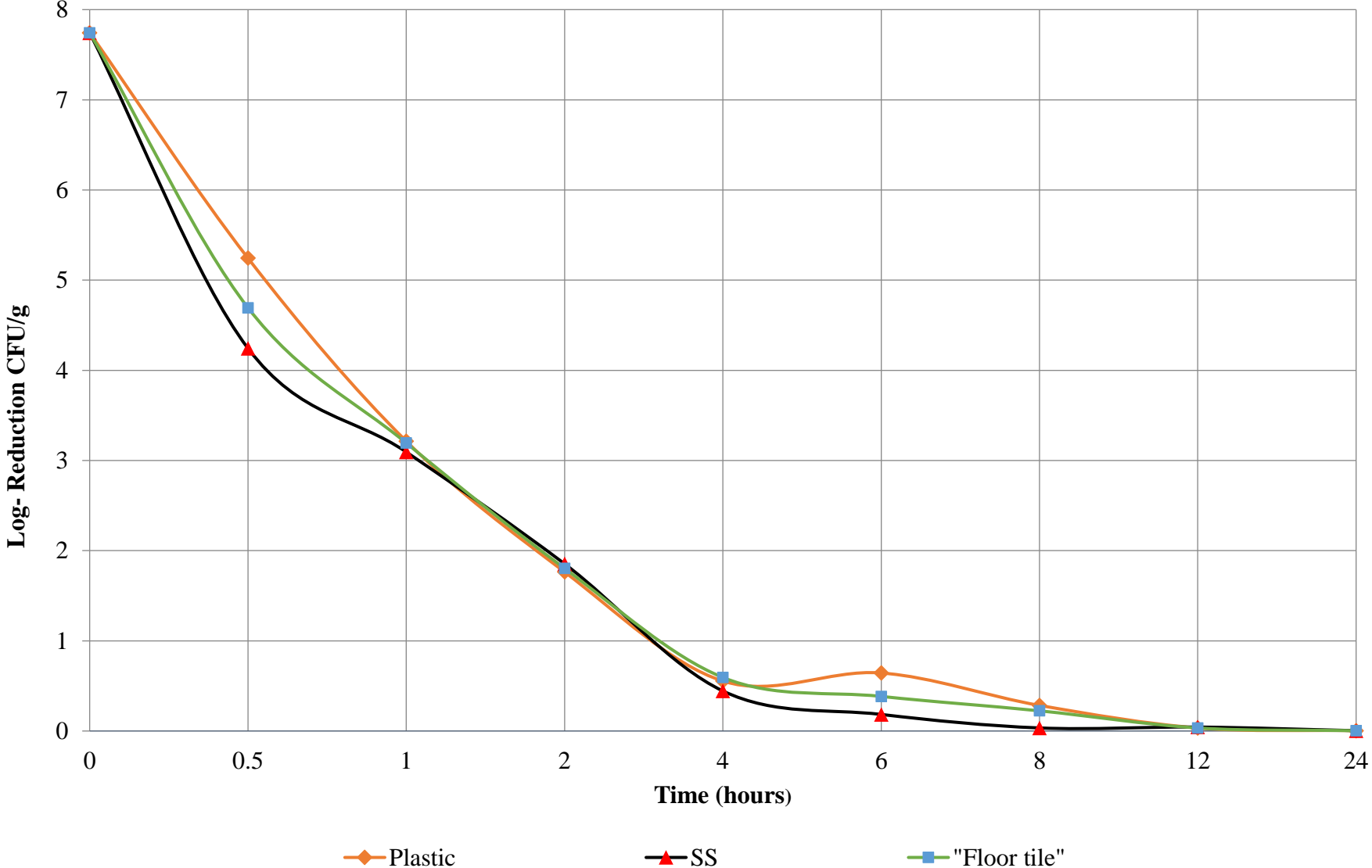
Time	Hepatitis B Stainless Steel			Reduction
	CFU	Log	SD	
0	19,952,623	7.30	0.2	7.30
0.5	32	5.80	0.2	1.50
1	4	6.75	0.3	0.55
2	2	7.10	0.2	0.20
4	1	7.25	0.2	0.05
6	1	7.30	0.1	0.00
8	1	7.30	0.2	0.00
12	1	7.30	0.3	0.00
24	1	7.30	0.2	0.00

Time	Hepatitis B Floor Tile			Reduction
	CFU	Log	SD	
0	19,952,623	7.30	0.2	7.30
0.5	33	5.78	0.2	1.52
1	4	6.66	0.3	0.64
2	2	7.05	0.2	0.25
4	1	7.19	0.2	0.11
6	1	7.30	0.1	0.00
8	1	7.30	0.2	0.00
12	1	7.30	0.3	0.00
24	1	7.30	0.2	0.00



* Tests conducted by Scientific Air Solutions, Turlock, California, in a test chamber (6' x 4' x 10') by exposing coupon inoculated with indicated organism – reflects actual pathogens (not surrogates) and reductions in organisms over time. Advanced oxidation system developed by airPHX company.

Geobacillus stearothermophilus
On Various Coupons Over Time



Time	Influenza A				Reduction
	Plastic				
	CFU	Log	SD		
0	3,162,278	6.50	0.2	6.50	
0.5	4	5.90	0.2	6.00	
1	1	6.35	0.3	0.15	
2	1	6.45	0.2	0.15	
4	1	6.45	0.2	0.05	
6	1	6.50	0.1	0.00	
8	1	6.50	0.2	0.00	
12	1	6.50	0.3	0.00	
24	1	6.50	0.2	0.00	

Time	Norovirus				Reduction
	Plastic				
	CFU	Log	SD		
0	10,000,000	7.00	0.2	7.00	
0.5	79	5.10	0.2	1.90	
1	10	6.00	0.3	1.00	
2	3	6.50	0.2	0.50	
4	2	6.74	0.2	0.36	
6	1	6.88	0.1	0.12	
8	1	6.85	0.2	0.15	
12	1	6.85	0.3	0.07	
24	1	6.89	0.2	0.11	

Time	Rhinovirus				Reduction
	Plastic				
	CFU	Log	SD		
0	56,234,133	7.58	0.2	7.75	
0.5	3,388	4.05	0.2	3.53	
1	275	5.14	0.3	2.44	
2	11	6.54	0.2	1.04	
4	5	6.87	0.2	0.71	
6	3	7.11	0.1	0.47	
8	1	7.45	0.2	0.13	
12	1	7.58	0.3	0.03	
24	1	7.48	0.2	0.10	

Time	Influenza A				Reduction
	Stainless Steel				
	CFU	Log	SD		
0	3,162,278	6.50	0.2	6.50	
0.5	1	6.69	0.2	0.2	
1	1	6.45	0.3	0.05	
2	1	6.48	0.2	0.02	
4	1	6.50	0.2	0.00	
6	1	6.50	0.1	0.00	
8	1	6.50	0.2	0.00	
12	1	6.50	0.3	0.00	
24	1	6.50	0.2	0.00	

Time	Norovirus				Reduction
	Stainless Steel				
	CFU	Log	SD		
0	10,000,000	7.00	0.2	7.00	
0.5	62	5.2	0.2	1.79	
1	11	5.95	0.3	1.05	
2	4	6.45	0.2	0.55	
4	2	6.67	0.2	0.33	
6	1	6.88	0.1	0.12	
8	1	6.90	0.2	0.10	
12	1	6.95	0.3	0.05	
24	1	6.99	0.2	0.01	

Time	Rhinovirus				Reduction
	Stainless Steel				
	CFU	Log	SD		
0	56,234,133	7.58	0.2	7.75	
0.5	2,089	3.72	0.2	3.28	
1	851	4.65	0.3	2.93	
2	13	6.48	0.2	1.10	
4	5	6.85	0.2	0.73	
6	3	7.12	0.1	0.46	
8	1	7.51	0.2	0.07	
12	1	7.58	0.3	0.00	
24	1	7.55	0.2	0.03	

Time	Influenza A				Reduction
	Floor Tile				
	CFU	Log	SD		
0	3,162,278	6.50	0.2	6.50	
0.5	6	5.70	0.2	0.80	
1	1	6.30	0.3	0.1	
2	1	6.40	0.2	0.10	
4	1	6.48	0.2	0.02	
6	1	6.50	0.1	0.00	
8	1	6.50	0.2	0.00	
12	1	6.50	0.3	0.00	
24	1	6.50	0.2	0.00	

Time	Norovirus				Reduction
	Floor Tile				
	CFU	Log	SD		
0	10,000,000	7.00	0.2	7.00	
0.5	66	5.18	0.2	1.82	
1	14	5.85	0.3	1.15	
2	5	6.29	0.2	0.71	
4	2	6.65	0.2	0.35	
6	2	6.80	0.1	0.20	
8	1	6.90	0.2	0.10	
12	1	6.95	0.3	0.05	
24	1	6.99	0.2	0.01	

Time	Rhinovirus				Reduction
	Floor Tile				
	CFU	Log	SD		
0	56,234,133	7.58	0.2	7.75	
0.5	16,982	3.35	0.2	4.23	
1	337	4.85	0.2	2.78	
2	11	6.55	0.2	1.03	
4	7	6.75	0.2	0.83	
6	2	7.21	0.2	0.37	
8	1	7.52	0.1	0.06	
12	1	7.55	0.1	0.03	
24	1	7.35	0.1	0.23	

Time	Acinetobacter baumannii				Reduction
	Plastic				
	CFU	Log	SD		
0	70,794,578	7.85	0.2	7.85	
0.5	1,175	4.78	0.2	3.07	
1	224	5.50	0.3	2.35	
2	63	6.05	0.2	1.80	
4	25	6.45	0.2	1.40	
6	9	6.89	0.1	0.96	
8	4	7.22	0.2	0.63	
12	2	7.56	0.3	0.29	
24	1	7.77	0.2	0.08	

Time	Bacteroides fragilis				Reduction
	Plastic				
	CFU	Log	SD		
0	35,481,339	7.55	0.2	7.55	
0.5	1,950	4.26	0.2	3.29	
1	63	5.75	0.3	1.80	
2	25	6.15	0.2	1.40	
4	14	6.41	0.2	1.15	
6	4	6.93	0.1	0.62	
8	2	7.19	0.2	0.36	
12	1	7.38	0.3	0.17	
24	1	7.53	0.2	0.02	

Time	Bacteroides fragilis				Reduction
	Stainless Steel				
	CFU	Log	SD		
0	35,481,339	7.55	0.2	7.55	
0.5	1,023	4.54	0.2	3.01	
1	40	5.95	0.3	1.66	
2	32	6.05	0.2	1.50	
4	17	6.32	0.2	1.23	
6	5	6.86	0.1	0.99	
8	2	7.20	0.2	0.55	
12	1	7.45	0.3	0.10	
24	1	7.50	0.2	0.05	

Time	Bacteroides fragilis				Reduction
	Floor Tile				
	CFU	Log	SD		
0	35,481,339	7.55	0.2	7.55	
0.5	1,622	4.34	0.2	3.21	
1	54	5.82	0.3	1.73	
2	22	6.21	0.2	1.54	
4	10	6.53	0.2	1.02	
6	3	7.02	0.1	0.53	
8	2	7.29	0.2	0.26	
12	1	7.50	0.3	0.05	
24	1	7.52	0.2	0.03	

Time	Bacteroides fragilis				Reduction
	Floor Tile				
	CFU	Log	SD		
0	35,481,339	7.55	0.2	7.55	
0.5	1,499	4.68	0.2	3.17	
1	309	5.36	0.3	2.49	
2	12	6.23	0.2	1.62	
4	12	6.77	0.2	1.08	
6	7	6.98	0.1	0.87	
8	3	7.33	0.2	0.52	
12	1	7.70	0.3	0.06	
24	1	7.85	0.2	0.00	

Time	Acinetobacter baumannii				Reduction
	Stainless Steel				
	CFU	Log	SD		
0	70,794,578	7.85	0.2	7.85	
0.5	1,862	4.58	0.2	3.27	
1	158	5.65	0.3	2.20	
2	56	6.10	0.2	1.75	
4	34	6.32	0.2	1.53	
6	10	6.86	0.1	0.99	
8	4	7.23	0.2	0.62	
12	2	7.67	0.3	0.18	
24	1	7.82	0.2	0.03	

Time	Bacteroides fragilis				Reduction
	Stainless Steel				
	CFU	Log	SD		
0	35,481,339	7.55	0.2	7.55	
0.5	1,023	4.54	0.2	3.01	
1	40	5.95	0.3	1.66	
2	32	6.05	0.2	1.50	
4	17	6.32	0.2	1.23	
6	5	6.86	0.1	0.99	
8	2	7.20	0.2	0.55	
12	1	7.45	0.3	0.10	
24	1	7.50	0.2	0.05	

Time	Bacteroides fragilis				Reduction
	Floor Tile				
	CFU	Log	SD		
0	35,481,339	7.55	0.2	7.55	
0.5	1,622	4.34	0.2	3.21	
1	54	5.82	0.3	1.73	
2	22	6.21	0.2	1.54	
4	10	6.53	0.2	1.02	
6	3	7.02	0.1	0.53	
8	2	7.29	0.2	0.26	
12	1	7.50	0.3	0.05	
24	1	7.52	0.2	0.03	

Time	Clostridium sordeili				Reduction
	Plastic				
	CFU	Log	SD		
0	58,884,366	7.77	0.2	7.77	
0.5	1,696	4.58	0.2	3.23	
1	66	5.95	0.3	1.82	
2	10	6.75	0.2	1.02	
4	5	7.05	0.2	0.72	
6	3	7.35	0.1	0.42	
8	2	7.50	0.2	0.27	
12	1	7.68	0.3	0.09	
24	1	7.77	0.2	0.00	

Time	Carbapenem-resistant Enterobacteriaceae				Reduction
	Plastic				
	CFU	Log	SD		
0	39,810,717	7.60	0.2	7.60	
0.5	6,607	3.78	0.2	1.89	
1	447	4.95	0.3	2.65	
2	32	6.10	0.2	1.50	
4	11	6.56	0.2	1.04	
6	3	7.16	0.1	0.44	
8	1	7.45	0.2	0.15	
12	1	7.55	0.3	0.05	
24	1	7.60	0.2	0.00	

Time	Carbapenem-resistant Enterobacteriaceae				Reduction
	Stainless Steel				
	CFU	Log	SD		
0	39,810,717	7.60	0.2	7.60	
0.5	2,089	3.95	0.2	3.32	
1	231	5.08	0.3	2.52	
2	22	6.25	0.2	1.55	
4	7	6.74	0.2	0.86	
6	2	7.31	0.1	0.29	
8	1	7.56	0.2	0.04	
12	1	7.60	0.3	0.00	
24	1	7.60	0.2	0.00	

Time	Carbapenem-resistant Enterobacteriaceae				Reduction
	Floor Tile				
	CFU	Log			

Time	E.coli O157:H7				Reduction
	Plastic			SD	
	CFU	Log	SD		
0	70,794,578	7.85	0.2	7.85	
0.5	437	5.21	0.2	2.64	
1	71	6.00	0.3	1.85	
2	8	6.94	0.2	0.91	
4	5	7.15	0.2	0.70	
6	3	7.56	0.1	0.49	
8	2	7.52	0.2	0.33	
12	1	7.80	0.3	0.05	
24	1	7.85	0.2	0.00	

Time	Hepatitis A				Reduction
	Plastic			SD	
	CFU	Log	SD		
0	28,183,829	7.45	0.2	7.45	
0.5	351	5.74	0.2	1.71	
1	9	6.51	0.3	0.94	
2	2	7.22	0.2	0.23	
4	1	7.39	0.2	0.06	
6	1	7.40	0.1	0.05	
8	1	7.45	0.2	0.00	
12	1	7.45	0.3	0.00	
24	1	7.45	0.2	0.00	

Time	Hepatitis B				Reduction
	Plastic			SD	
	CFU	Log	SD		
0	19,952,623	7.30	0.2	7.30	
0.5	23	5.78	0.2	1.52	
1	4	6.66	0.3	0.64	
2	2	7.05	0.2	0.25	
4	1	7.19	0.2	0.11	
6	1	7.30	0.1	0.00	
8	1	7.30	0.2	0.00	
12	1	7.30	0.3	0.00	
24	1	7.30	0.2	0.00	

Time	Hepatitis C				Reduction
	Plastic			SD	
	CFU	Log	SD		
0	25,118,864	7.40	0.2	7.40	
0.5	71	5.55	0.2	1.85	
1	7	6.54	0.3	0.86	
2	3	6.98	0.2	0.42	
4	2	7.10	0.2	0.30	
6	1	7.38	0.1	0.02	
8	1	7.40	0.2	0.00	
12	1	7.40	0.3	0.00	
24	1	7.40	0.2	0.00	

Time	Klebsiella pneumoniae				Reduction
	Plastic			SD	
	CFU	Log	SD		
0	63,095,734	7.80	0.2	7.80	
0.5	18,197	3.54	0.2	4.26	
1	2,855	4.41	0.2	2.59	
2	141	5.65	0.2	2.15	
4	49	6.11	0.2	1.69	
6	6	7.04	0.1	0.76	
8	2	7.56	0.2	0.24	
12	1	7.80	0.3	0.00	
24	1	7.80	0.2	0.00	

Time	Morganella morganii				Reduction
	Plastic			SD	
	CFU	Log	SD		
0	44,668,359	7.65	0.2	7.65	
0.5	15,849	3.45	0.2	4.20	
1	708	4.80	0.3	2.85	
2	50	5.95	0.2	1.70	
4	14	6.51	0.2	1.14	
6	6	6.90	0.1	0.75	
8	1	7.49	0.2	0.16	
12	1	7.65	0.3	0.00	
24	1	7.65	0.2	0.00	

Time	Hepatitis C				Reduction
	Stainless Steel			SD	
	CFU	Log	SD		
0	25,118,864	7.40	0.2	7.40	
0.5	56	5.65	0.2	1.75	
1	6	6.61	0.3	0.79	
2	2	7.01	0.2	0.39	
4	1	7.25	0.2	0.15	
6	1	7.35	0.1	0.05	
8	1	7.40	0.2	0.00	
12	1	7.40	0.3	0.00	
24	1	7.40	0.2	0.00	

Time	Klebsiella pneumoniae				Reduction
	Stainless Steel			SD	
	CFU	Log	SD		
0	63,095,734	7.80	0.2	7.80	
0.5	13,183	3.74	0.2	4.06	
1	1,413	4.65	0.3	3.15	
2	62	6.01	0.2	1.79	
4	19	6.82	0.2	1.19	
6	4	7.25	0.1	0.55	
8	1	7.66	0.2	0.14	
12	1	7.80	0.3	0.00	
24	1	7.80	0.2	0.00	

Time	Morganella morganii				Reduction
	Stainless Steel			SD	
	CFU	Log	SD		
0	44,668,359	7.65	0.2	7.65	
0.5	26,303	3.23	0.2	4.42	
1	851	4.72	0.3	2.93	
2	60	5.87	0.2	1.78	
4	21	6.32	0.2	1.23	
6	6	6.86	0.1	0.79	
8	2	7.35	0.2	0.30	
12	1	7.65	0.3	0.00	
24	1	7.65	0.2	0.00	

Time	Hepatitis C				Reduction
	Plastic			SD	
	CFU	Log	SD		
0	25,118,864	7.40	0.2	7.40	
0.5	48	5.72	0.2	1.68	
1	4	6.45	0.3	0.65	
2	2	7.14	0.2	0.26	
4	1	7.30	0.2	0.10	
6	1	7.40	0.1	0.00	
8	1	7.40	0.2	0.00	
12	1	7.40	0.3	0.00	
24	1	7.40	0.2	0.00	

Time	Klebsiella pneumoniae				Reduction
	Plastic			SD	
	CFU	Log	SD		
0	63,095,734	7.80	0.2	7.80	
0.5	13,183	3.68	0.2	4.12	
1	1,022	4.59	0.2	3.21	
2	48	6.12	0.2	1.68	
4	20	6.49	0.2	1.31	
6	4	7.19	0.1	0.61	
8	1	7.63	0.2	0.17	
12	1	7.80	0.3	0.00	
24	1	7.80	0.2	0.00	

Time	Morganella morganii				Reduction
	Plastic			SD	
	CFU	Log	SD		
0	44,668,359	7.65	0.2	7.65	
0.5	19,953	3.35	0.2	4.30	
1	337	4.39	0.2	2.93	
2	43	6.02	0.2	1.63	
4	17	6.42	0.2	1.23	
6	5	6.95	0.1	0.70	
8	2	7.29	0.2	0.36	
12	1	7.65	0.3	0.00	
24	1	7.65	0.2	0.00	

Time	Mycobacterium abscessus				Reduction
	Plastic			SD	
	CFU	Log	SD		
0	35,481,339	7.55	0.2	7.55	
0.5	1,259	4.45	0.2	3.10	
1	69	5.71	0.3	1.84	
2	20	6.25	0.2	1.30	
4	6	6.75	0.2	0.80	
6	3	7.03	0.1	0.52	
8	2	7.30	0.2	0.25	
12	1	7.55	0.3	0.00	
24	1	7.55	0.2	0.00	

Time	Stenotrophomonas maltophilia				Reduction
	Plastic			SD	
	CFU	Log	SD		
0	39,810,717	7.60	0.2	7.60	
0.5	8,318	3.68	0.2	3.92	
1	447	4.95	0.3	2.65	
2	71	5.75	0.2	1.85	
4	5	6.86	0.2	0.74	
6	2	7.25	0.1	0.35	
8	1	7.49	0.2	0.11	
12	1	7.60	0.3	0.00	
24	1	7.60	0.2	0.00	

Time	Vancomycin-resistant Staphylococcus aureus				Reduction
	Plastic			SD	
	CFU	Log	SD		
0	47,863,009	7.68	0.2	7.68	
0.5	4,266	4.05	0.2	3.63	
1	115	5.62	0.3	2.06	
2	29	6.55	0.2	1.43	
4	5	6.98	0.2	0.70	
6	3	7.25	0.1	0.43	
8	1	7.51	0.2	0.17	
12	1	7.68	0.3	0.00	
24	1	7.68	0.2	0.00	

Time	Mycobacterium abscessus				Reduction
	Stainless Steel			SD	
	CFU	Log	SD		
0	35,481,339	7.55	0.2	7.55	
0.5	1,096	4.51	0.2	3.04	
1	54	5.82	0.3	1.73	
2	17	6.31	0.2	1.24	
4	6	6.80	0.2	0.75	
6	3	7.15	0.1	0.40	
8	1	7.46	0.2	0.09	
12	1	7.55	0.3	0.00	
24	1	7.55	0.2	0.00	

Time	Stenotrophomonas maltophilia				Reduction
	Stainless Steel			SD	
	CFU	Log	SD		
0	39,810,717	7.60	0.2	7.60	
0.5	7,093	3.75	0.2	3.85	
1	550	4.86	0.3	2.74	
2	60	5.82	0.2	1.78	
4	4	6.95	0.2	0.65	
6	2	7.32	0.1	0.28	
8	1	7.59	0.2	0.01	
12	1	7.60	0.3	0.00	
24	1	7.60	0.2	0.00	

Time	Vancomycin-resistant Staphylococcus aureus				Reduction
	Stainless Steel			SD	
	CFU	Log	SD		
0	47,863,009	7.68	0.2	7.68	
0.5	2,089	4.21	0.2	3.82	
1	69	5.84	0.3	1.84	
2	15	6.50	0.2	1.18	
4	4	7.12	0.2	0.56	
6	2	7.36	0.1	0.32	
8	1	7.61	0.2	0.07	
12	1	7.68	0.3	0.00	
24	1	7.68	0.2	0.00	

Time	Mycobacterium abscessus				Reduction
	Plastic			SD	
	CFU	Log	SD		
0	35,481,339	7.55	0.2	7.55	
0.5	1,122	4.50	0.2	3.05	
1	176	5.79	0.2	1.76	
2	18	6.29	0.2	1.26	
4	5	6.85	0.2	0.70	
6	3	7.09	0.1	0.46	
8	1	7.43	0.2	0.12	
12	1	7.55	0.3	0.00	
24	1	7.55	0.2	0.00	

Time	Stenotrophomonas maltophilia				Reduction
	Plastic			SD	
	CFU	Log	SD		
0	39,810,717	7.60	0.2	7.60	
0.5	6,026	3.82	0.2	3.78	
1	490	4.91	0.2	2.69	
2	45	5.95	0.2	1.65	
4	4	7.00	0.2	0.60	
6	2	7.29	0.1	0.31	
8	1	7.52	0.2	0.08	
12	1	7.60	0.3	0.00	
24	1	7.60	0.2	0.00	

Time	Vancomycin-resistant Staphylococcus aureus				Reduction
	Plastic			SD	
	CFU	Log	SD		
0	47,863,009	7.68	0.2	7.68	
0.5	3,162	4.18	0.2	3.50	
1	85	5.75	0.3	1.95	
2	16	6.48	0.2	1.20	
4	2	7.31	0.2	0.37	
6	1	7.58	0.1	0.10	
8	1	7.66	0.2	0.02	
12	1	7.68	0.3	0.00	
24	1	7.68	0.2	0.00	

Time	Clostridium difficile				Reduction
	Plastic			SD	
	CFU	Log	SD		
0	56,234,133	7.65	0.2	7.75	
0.5	12,882	3.54	0.2	4.11	
1	1,738	4.41	0.3	3.24	
2	100	5.65	0.2	2.00	
4	45	6.11	0.2	1.54	
6	32	6.15	0.1	1.50	
8	27	6.22	0.2	1.43	
12	5	6.94	0.3	0.71	
24	5	6.95	0.2	0.70	

AIRPHX Independent Field Testing*

		Testing Dates		AIR Samples (cfu/m ³)			SURFACE (cfu/cm ²)		
		Pre-Treatment	In-Treatment	Pre-Treatment	Post-Treatment	% CHANGE	Pre-Treatment	Post-Treatment	% CHANGE
<u>College Sports Programs Treatment Area</u>									
FBS Independents	Locker Room - Hockey	11/9/2021	3/30/2022	325	38	-88.3%	32.8	2.9	-91.2%
Horizon	Athletic Training Room	10/25/2021	1/12/2022	506	22	-95.7%	34.0	2.9	-91.5%
Mid-American	Wrestling	10/25/2021	1/12/2022	904	46	-94.9%	42.8	4.0	-90.7%
Mid-American	Athletic Training Room	12/26/2021	1/11/2022	621	67	-89.2%	31.4	2.5	-92.0%
Atlantic 10	Weight Room	10/14/2021	12/7/2021	349	58	-83.4%	32.5	3.3	-89.8%
NAIA Crossroads	Weight Room	10/13/2021	12/6/2022	1,567	84	-94.6%	43.0	4.5	-89.5%
Mid-American	Athletic Training Room	10/13/2021	12/6/2022	409	78	-80.9%	27.4	2.3	-91.6%
FBS Independents	Athletic Training Room	7/28/2021	9/20/2021	380	127	-66.6%	41.5	16.6	-60.0%
PAC 12	Athletic Training Room	7/27/2021	9/20/2021	267	27	-89.9%	51.5	6.0	-88.4%
NEAC	Strength Training	11/18/2020	1/21/2021	351	13	-96.3%	30.5	2.7	-91.2%
Winter Olympics	Athletic Training Room	10/22/2019	3/30/2020	321	9	-97.2%	46.7	3.3	-92.9%
BIG 10	Wrestling	10/8/2019	1/7/2020	307	10	-96.7%	70.1	4.2	-94.0%
SEC	ATR	9/27/2019	11/8/2019	427	39	-90.9%	56.2	1.8	-96.8%
PAC 12	Football ATR	8/15/2019	11/5/2019	367	49	-86.6%	58.8	3.8	-93.5%
USA	Football Equipment Room	1/28/2019	11/4/2019	679	46	-93.2%	43.1	0.4	-99.1%
BIG 10	Locker - Football	8/12/2019	10/28/2019	(1)	92	NA	48.6	2.1	-95.7%
BIG 10	Wrestling	8/23/2019	10/28/2019	600	25	-95.8%	52.9	1.8	-96.6%
BIG 10	Football - ATR	8/20/2019	10/10/2019	355	26	-92.7%	97.0	4.2	-95.7%
BIG 10	**Wrestling Room (outside doors open)	8/20/2019	10/10/2019	2,100	446	-78.8%	110.0	3.5	-96.8%
BIG 10	ATR	8/21/2019	10/10/2019	838	71	-91.5%	42.4	1.8	-95.8%
BIG 10	***ATR	8/19/2019	10/7/2019	830	152	-81.7%	56.4	2.1	-96.3%
BIG 10	Hockey	8/8/2019	10/2/2019	313	19	-93.9%	50.1	2.3	-95.4%
BIG 10	ATR (including Hydro)	8/8/2019	10/2/2019	953	83	-91.3%	78.6	3.2	-95.9%
BIG 10	Football - ATR (including Hydro)	8/7/2019	10/1/2019	427	42	-90.2%	28.8	1.3	-95.5%
BIG 10	Hockey (Locker/Weight/ATR)	8/7/2019	10/1/2019	436	39	-91.1%	54.7	2.2	-96.0%
SEC	Track & Field Locker	11/27/2018	1/10/2019	571	44	-92.3%	68.5	3.7	-94.6%
NSIC	Football Locker Room	9/27/2018	10/4/2018	NA	NA	NA	56.4	2.9	-94.9%
Patriot	Strength Training Gym	12/13/2017	1/24/2018	706	81	-88.5%	11.0	0.5	-95.5%
CAA	Sports Medicine Room	7/14/2017	9/6/2017	1,896	61	-96.8%	1,235.0	26.0	-97.9%
Averages				659	68	-90.0%	90.8	4.1	-92.9%
<u>Halo Effect (adjacent spaces)</u>									
FBS Independents	ATR (Halo Effect)	7/28/2021	9/20/2021	419	167	-60.1%	NA	NA	NA
US Ski & Snowboard	Weight room	10/22/2019	3/30/2020	327	20	-93.9%	31.7	1.5	-95.2%
BIG 10	Wrestling Locker Room	10/8/2019	1/7/2020	458	33	-92.8%	27.3	0.9	-96.7%
PAC 12	Hydro (just 1 surface sample)	8/15/2019	11/5/2019	350	117	-66.6%	42.5	3.6	-91.5%
BIG 10	ATR - Hydro/Hall (Halo Effect)	8/20/2019	10/10/2019	458	192	-58.1%	115.0	5.5	-95.2%
BIG 10	ATR - Hydro (Halo effect)	8/21/2019	10/10/2019	650	283	-56.5%	NA	NA	NA
BIG 10	Hallway/Nutrition/Turf (Halo)	8/19/2019	10/7/2019	1,050	622	-40.8%	NA	NA	NA
BIG 10	ATR - Hydro (Halo effect)	8/8/2019	10/2/2019	1,367	134	-90.2%	37.3	1.3	-96.5%
BIG 10	ATR - Hydro (Halo effect)	8/7/2019	10/1/2019	383	100	-73.9%	9.0	0.3	-96.7%
BIG 10	Weight (Halo effect)	8/7/2019	10/1/2019	756	144	-81.0%	NA	NA	NA
Averages				622	181	-71.4%	44	2	-95.3%
<u>Indoor turf facilities</u>									
BIG 10	Turf Indoor	10/2/2019	7/1/2021	2,056	107	-94.8%	54.9	2.9	-94.7%
BIG 10	Turf Indoor	6/23/2020	5/3/2021	1,753	160	-90.9%	55.5	7.0	-87.4%

* Air quality scale for workplaces, public buildings, schools and homes are as follows: (i) less than 100 cfu/m³ is considered clean and acceptable; (ii) 100 to 300 cfu/m³ is marginal; and (iii) more than 300 cfu/m³ is not acceptable and needs corrective action. Contact surface quality scale for workplaces, public buildings, schools and homes are as follows: (i) less than 5 cfu/cm² is considered clean and acceptable;

(ii) 5 to 10 cfu/cm² is considered marginal; and (iii) more than 10 cfu/cm² is considered not acceptable and needs corrective action.

** Results may be impacted by operating fans and open doorway -- outside air introduction

*** Results may be understated due to unit being shut off for some period for facilities review; doorways to hall open at time of testing may have introduced outside air

AIRPHX Independent Field Testing*

	Testing Dates		AIR Samples (cfu/m3)			SURFACE (cfu/cm2)		
	Pre-Treatment	In-Treatment	Pre-Treatment	Post-Treatment	% CHANGE	Pre-Treatment	Post-Treatment	% CHANGE
<u>Commercial Gyms</u>								
Boutique Gym	9/21/2022	11/1/2022	311	59	-81.0%	26.8	3.2	-88.1%
Hotel Gym & Surrounding Areas (DC)	6/16/2020	7/20/2020	312	107	-65.7%	46.3	3.4	-92.7%
Big Box Gym (MD)	6/9/2020	7/14/2020	323	22	-93.2%	52.4	2.9	-94.5%
HS Wrestling Gym	12/13/2019	3/6/2020	3,717	86	-97.7%	36.7	2.6	-92.9%
HS gym (Halo Effect)	12/13/2019	3/6/2020	333	8	-97.6%	NA	NA	NA
Military Base Gym	9/25/2018	10/29/2018	1,218	91	-92.5%	35.5	1.8	-94.9%
Yoga (Hot & Normal)	6/19/2018	7/19/2018	1,083	42	-96.1%	63.0	0.4	-99.4%
Yoga (Hot & Normal)	6/12/2018	7/12/2018	881	77	-91.3%	103.0	1.0	-99.0%
National Chain (Small Box)	1/31/2018	3/7/2018	1,149	76	-93.4%	34.0	1.2	-96.5%
Big Box Gym (NY)	11/7/2017	12/14/2017	1,514	20	-98.7%	28.0	0.7	-97.5%
Big Box Gym (NJ)	11/7/2017	12/14/2017	1,074	15	-98.6%	22.0	0.1	-99.5%
HS Field House	10/26/2017	12/4/2017	758	91	-88.0%	2,850.0	28.0	-99.0%
HS Weight & Wrestling	10/26/2017	12/4/2017	731	83	-88.6%	4,167.0	3.0	-99.9%
Boutique Gym Chain	5/11/2016	2/20/2017	848	47	-94.5%	274.0	8.0	-97.1%
Regional Chain Gym (Large)	10/20/2016	2/7/2017	NA	NA	NA	2,436.0	51.0	-97.9%
Averages			1,018	59	-91.2%	726.8	7.7	-96.3%

AIRPHX Independent Field Testing*

	Testing Dates		AIR Samples (cfu/m3)			SURFACE (cfu/cm2)		
	Pre-Treatment	In-Treatment	Pre-Treatment	Post-Treatment	% CHANGE	Pre-Treatment	Post-Treatment	% CHANGE
<u>Hospitals and Healthcare</u>								
Family Practice Physicians' Office	4/18/2020	11/3/2020	497	72	-85.5%	34.8	4.5	-87.1%
Outpatient Lab Facility	9/4/2020	11/2/2020	750	83	-88.9%	25.5	3.0	-88.2%
Family Practice Physicians' Office	9/4/2020	11/2/2020	629	151	-76.0%	25.7	3.9	-84.8%
Senior Living Center	6/18/2020	7/9/2020	393	31	-92.1%	41.9	3.2	-92.4%
Outpatient Facility	4/18/2020	5/5/2020	539	74	-86.3%	32.2	2.8	-91.3%
Specialty Hospital Floor	11/26/2019	3/13/2020	219	33	-84.9%	48.9	2.6	-94.7%
Hospital ICU	7/25/2019	10/16/2019	279	18	-93.5%	56.0	1.5	-97.3%
Hospital Oncology Floor	1/25/2018	7/25/2019	767	39	-94.9%	NA	NA	NA
Hospital Nurse Station	1/25/2018	7/25/2019	1,113	13	-98.8%	NA	NA	NA
Hospital Floors (3)	4/23/2019	6/1/2019	292	44	-84.9%	29.4	2.0	-93.2%
Dental Office	3/24/2017	4/20/2018	586	12	-98.0%	303.0	2.0	-99.3%
Hospital Waiting Room	2/12/2018	3/20/2018	880	77	-91.3%	41.0	1.9	-95.4%
Hospital Oncology Floor	1/25/2018	2/12/2018	767	40	-94.8%	17.0	0.2	-98.8%
Hospital Nurse Station	1/25/2018	2/12/2018	1,113	80	-92.8%	NA	NA	NA
Hospital Elevator Bays (8)	1/25/2018	2/12/2018	1,640	78	-95.2%	NA	NA	NA
Dental Office	3/24/2017	3/26/2017	586	80	-86.3%	303.0	9.0	-97.0%
Averages			691	58	-90.3%	79.9	3.1	-93.3%

AIRPHX Independent Field Testing*

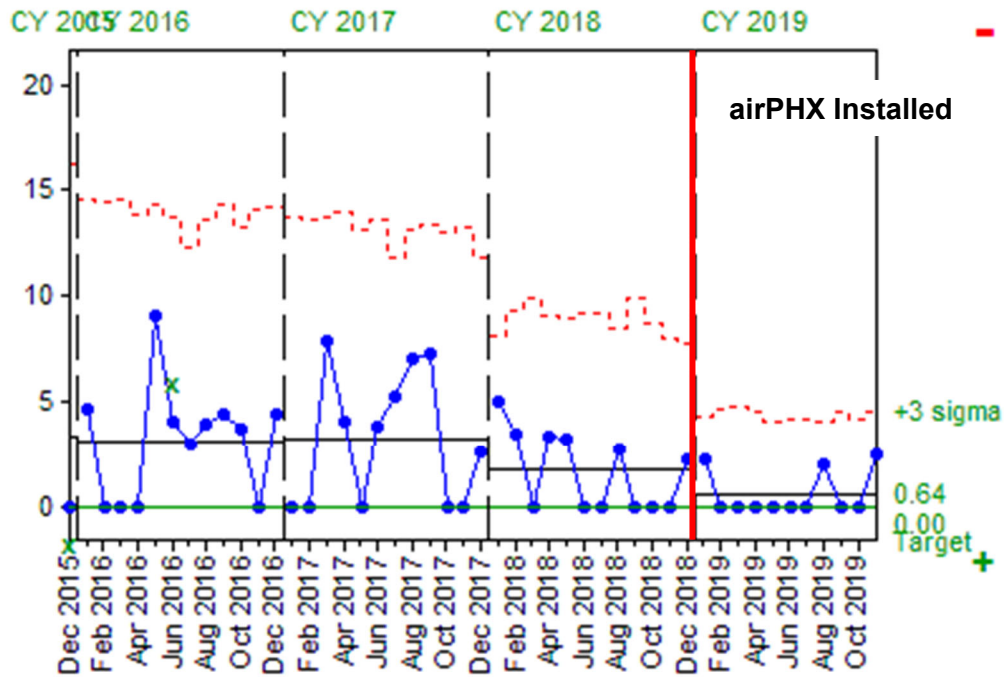
	Testing Dates		AIR Samples (cfu/m3)			SURFACE (cfu/cm2)		
	Pre-Treatment	In-Treatment	Pre-Treatment	Post-Treatment	% CHANGE	Pre-Treatment	Post-Treatment	% CHANGE
<u>Miscellaneous Tests</u>								
Hotel Ballroom	11/3/2022	11/17/2022	300.0	47.0	-84.3%	31.1	7.4	-76.2%
Restaurant	12/19/2021	1/18/2022	1,167.0	15.0	-98.7%	36.3	3.1	-91.5%
Indoor Soccer Field	11/11/2021	12/15/2021	1,046.0	33.0	-96.8%	31.4	3.0	-90.4%
Private School (K to 12th)	10/20/2021	11/30/2021	937.0	93.0	-90.1%	32.5	3.3	-89.8%
Hotel	6/25/2020	6/24/2021	NA	NA	NA	31.1	1.5	-95.2%
Private School (Pre-K to 8th)	5/20/2021	6/22/2021	1,684	79	-95.3%	51.5	9.4	-81.8%
Private School (Pre-K to 8th)	2/3/2021	4/14/2021	300	17	-94.3%	27.2	1.9	-93.0%
Casino	7/2/2020	4/5/2021	590	13	-97.8%	17.5	1.7	-90.3%
Pre-School/Day Care	7/16/2020	9/8/2020	356	96	-73.0%	27.0	4.1	-84.8%
Corporate Office	6/9/2020	7/14/2020	269	16	-94.1%	54.3	2.9	-94.7%
Bank Branch	4/18/2020	5/5/2020	506	33	-93.5%	32.0	2.2	-93.1%
High School	10/22/2019	11/20/2019	2,817	133	-95.3%	84.7	4.1	-95.2%
Pre-School/Day Care	7/18/2019	8/16/2019	657	71	-89.2%	83.9	1.9	-97.7%
Boys College Preparatory School (6th to 12th)	9/27/2018	1/16/2019	6,017	50	-99.2%	832.5	4.7	-99.4%
County Rec Center	11/17/2018	2/8/2019	818	27	-96.7%	41.5	1.8	-95.7%
County Office Building	11/29/2018	1/10/2019	433	4	-99.1%	57.9	2.8	-95.2%
High School Building	4/5/2018	5/2/2018	NA	NA	NA	78.0	4.4	-94.4%
Private Residence	10/13/2017	3/15/2018	1,135	98	-91.4%	285.0	4.5	-98.4%
Private Residence	2/13/2018	3/14/2018	1,650	83	-95.0%	129.0	7.0	-94.6%
Veterinarian	10/18/2017	11/28/2017	1,085	169	-84.4%	102.0	25.0	-75.5%
Private Residence	10/5/2017	11/2/2017	1,121	108	-90.4%	271.0	16.0	-94.1%
School for Autistic Children	5/2/2017	7/15/2017	1,456	159	-89.1%	694.0	53.0	-92.4%
Averages			1,217	67	-92.4%	137.8	7.5	-91.5%

Exhibit III

U Chart 3-Sigma

Central Line Infections per 1000 Line Days

Summary



Jan 6, 2020 14:18:24

Exhibit III Clostridium Difficile Time Series Data

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