



The Air is BETTER HERE

We take testing seriously.
AtmosAir Comprehensive Test Data

AtmosAir Real World Testing USA



Client	CO ₂ Before (PPM)	CO ₂ After (PPM)	PM10 Before (ug/m ³)	PM10 After (ug/m ³)	PM2.5 Before (ug/m ³)	PM2.5 After (ug/m ³)	TVOC Before (PPM)	TVOC After (PPM)	Laboratory Mold Testing	Indiv. VOC Element Testing	Ozone Before	Ozone After	Energy Project
US Department of Defense	614	576	24	7	19	5	n/a	n/a	✓ (-41%)	n/a	n/a	n/a	✓
California Public School	847.5	798.5	23.1	31.37	6.65	6.2	69.25	1.65	✓	n/a	0	0	✗
Arena - Los Angeles, CA	560	470	25	19	n/a	n/a	13	0	✗	Yes	0.015	0	✓
Global Banking Institution 1 - New York, NY	991	1006	6	4	1	1	40	21	✗	n/a	0	0	✗
Florida-based Power Utility Company - Plantation, FL	1046	693	15	6	10	4	5	0	✗	n/a	0	0	✓
Largest Global Architecture Firm - Los Angeles, CA	639	609	6	2	5	3	25	8	✗	n/a	0.024	0	✗
Connecticut-based Public School System	1007	769	12	7	7	1	2	0	✓ (-95%)	n/a	0.001	0	✗
Global Hotel & Resort - New York, NY	491	477	7	6	5	4	10	0	✗	n/a	0	0	✓
Global Banking Institution 2 - New York, NY	485	689	4	2	3	2	8	1	✗	n/a	0	0	✗
Global Banking Institution 3 - New York, NY	726	736	7	8	4	1	150	2	✗	n/a	0.005	0.004	✗
Casino (100k Sq Ft Gaming Space) - Pittsburgh, PA	589	799	91	88	88	96	150	28	✗	n/a	0	0	✗
Vivarium - New York	3000	2995	13	14	1	1	150	116	✗	n/a	0	0	✓
Research - Los Angeles, CA	1087	776	62	17	2	1	22	8	✗	n/a	0	0	✗
Private Research University - Los Angeles, CA	n/a	n/a	9	2	14	2	17	2	✗	n/a	0	0	✓
Medical Center - New York	1268	1074	12	11	10	5	116	61	n/a	n/a	0.01	0.01	✗
West Coast Real Estate Conglomerate - CA	620	691	6	7	4	6	9	6	n/a	✓	0	0	✓
Arena - Nashville, TN	488	385	9	10	9	9	25	1	n/a	n/a	0.008	0	✗
Global Mass Media Company - New York, NY	804	829	5	2	6	2	150	20	n/a	n/a	0	0	✗
Big 4 Accounting Firm - Westlake, TC	508	514	9	7	7	6	150	53	n/a	n/a	0	0	✗
Global Bank Institution 4 - New Jersey	847	989	30	4	28	2	48	30	n/a	n/a	0	0	✗
American Multinational Hospitality Company - Chicago, IL	475	503	4	5	4	4	150	10	n/a	n/a	0	0	✗
Minnesota Public School	904	580	34	12	11	3	6	3	n/a	n/a	0	0	✓
Major Casino - Hollywood, FL			101	55	97	50	119	24	n/a	n/a	0	0	
Tower 45 - 120 West 45th St	1182	1200	6	3	5	2	18	11	n/a	n/a	0	0	✓

Study Report – AtmosAir vs. Coronavirus



Test Report | Microchem Laboratory

Test Results at 30 minutes

Study Title

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

Product Identity

AtmosAir Matterhorn Series

Standardized Test Method

ASTM E1053

Maximum Ionization Rate

1,500 ions cm/3

		Test Results Replicate 1 30 minutes	Test Results Replicate 2 30 minutes	Test Results Replicate 3 30 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
	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
TCID₅₀ per 0.1 ml		0.75 Log ₁₀	0.75 Log ₁₀	≤0.50 Log ₁₀
TCID₅₀ per Carrier		1.05 Log ₁₀	1.05 Log ₁₀	≤0.80 Log ₁₀
Average Log₁₀ Reduction			2.78 Log ₁₀	
Average Percent Reduction			99.92%	

TEST RESULTS

The presence of coronavirus was reduced by 99.92% within 30 minutes of exposure to AtmosAir's bi-polar ionization technology

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

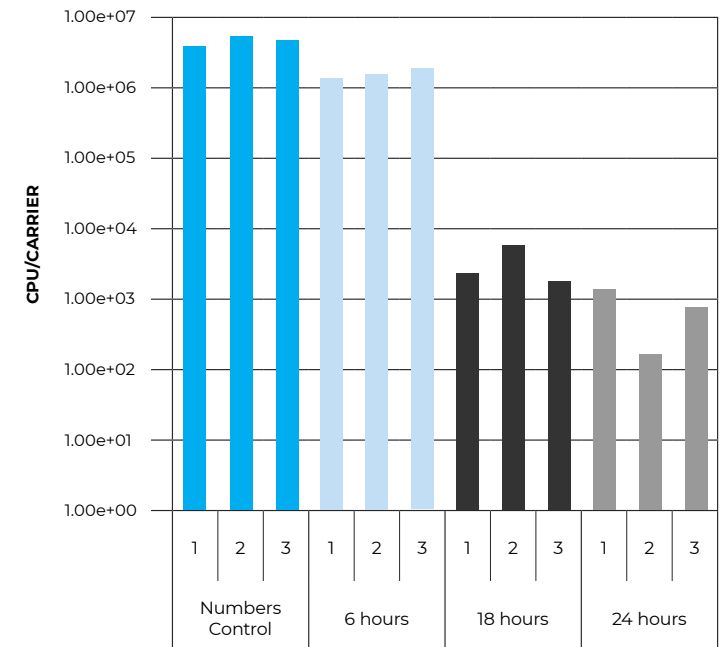
Study Report – AtmosAir vs. C. Diff

Test Report | Microchem Laboratory



The following graph and table are the calculated results for C. difficile 43598 (Endospores) when treated with AtmosAir in a closed chamber measuring 4'x4'.

Test device Capital D	Test Microorganism	Carrier Control/ Treatment	Replicate or Control Time Point	CFU/Carrier	Average CFU/Carrier	Percent Reduction Compared to Control at Contact Time	Log ₁₀ Reduction Compared to Control at Contact Time
Matterhorn	C. difficile 43598 (Endospores)	Numbers Control	6 hours	3.60E+06	n/a		
			18 hours	4.50E+06			
			24 hours	3.60E+06			
		6 hours	1	1.19E+06	1.53E+06	57.59%	0.37
			2	1.38E+06			
			3	2.01E+06			
		18 hours	1	2.50E+03	3.33E+03	99.93%	3.13
			2	5.20E+03			
			3	2.30E+03			
		24 hours	1	1.51E+03	8.17E+02	99.98%	3.64
			2	1.30E+02			
			3	8.10E+02			



The limit of detection for this assay is 1.00E+01 results below the limit of detection are reported as <1.00E+01.
Maximum Ionization Rate: 1,500 ions/cm³

TEST RESULTS:

The presence of C. Diff was reduced by 99.93% within 18 hours of exposure to AtmosAir's bi-polar ionization technology.

Ionization rate of 1,500 ions/cm³ is indicative of an ionization rate achieved with the AtmosAir system operating in a standard office building, school, hospital.

Testing by Microchem Labs of AtmosAir vs. superbug C. difficile.

AtmosAir vs. Airborne Staph, MRSA, MS2 Bacteriophage, E. Coli

Test Report | Antimicrobial Test Laboratories



Microorganism	Test Device	Initial Numbers Control (CFU/m ³)	Sampling Time Point	Recovery (CFU/m ³)		Percent Reduction vs. Normalized Number Control	Log Reduction vs. Normalized Number Control
				Normalized Numbers Control	Test Data		
S. saprophyticus ATCC 35552	Matterhorn	4.14E+08	15 Minutes	3.39E+07	2.31E+05	99.32%	2.17
			45 Minutes	4.48E+06	<2.27E+01	99.9995%	5.29

Note: The Limit of Detection (LOD) for this germ is 22.7 CFU/m³. Values below the LOD are represented as <2.27E+01 in the chart above and 0 in the graph below.

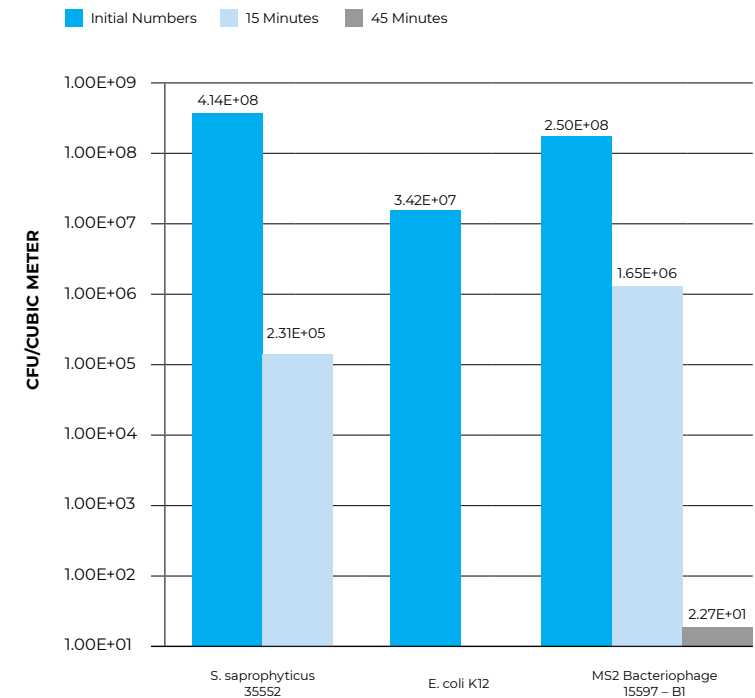
Microorganism	Test Device	Initial Numbers Control (CFU/m ³)	Sampling Time Point	Recovery (CFU/m ³)		Percent Reduction vs. Normalized Number Control	Log Reduction vs. Normalized Number Control
				Normalized Numbers Control	Test Data		
E. coli K12	Matterhorn	3.42E+07	15 Minutes	1.18E+06	<7.68E+02	>99.94%	3.19
			45 Minutes	1.61E+05	<2.27E+01	>99.986%	>3.85

Note: The Limit of Detections (LOD) for this germ are 768 CFU/m³ and 22.7 CFU/m³ for 15 and 45 minutes, respectively. Values below the LOD are represented as <7.68E+02 and <2.27E+01 in the chart above and 0 in the graph below.

Microorganism	Test Device	Initial Numbers Control (CFU/m ³)	Sampling Time Point	Recovery (CFU/m ³)		Percent Reduction vs. Normalized Number Control	Log Reduction vs. Normalized Number Control
				Normalized Numbers Control	Test Data		
MS2 Bacteriophage ATCC 15597-B1	Matterhorn	2.50E+08	15 Minutes	8.84E+07	1.65E+06	98.13%	1.73
			45 Minutes	3.32E+07	2.27E+01	99.99993%	6.17

Note: The Limit of Detection (LOD) for this germ is 22.7 CFU/m³. Values below the LOD are represented as <2.27E+01 in the chart above and 0 in the graph on the right

Relative Performance of AtmosAir Matterhorn when Tested Against Bioaerosolized Microorganismst



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

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Test Result

The presence of aerosolized Staph was reduced by 99.32% within 15 minutes. The presence of aerosolized E. Coli was reduced by 99.94% within 15 minutes. The presence of aerosolized MS2 Bacteriophage was reduced by 98.13% within 15 minutes.

AtmosAir vs. VOCs - Syracuse University Lab Test Full-Scale Chamber Testing of Air Cleaner Performance for the Removal of Volatile Organic Compounds

TVOC Testing - Third Party Chamber Testing of AtmosAir vs. VOCs with Syracuse University Center of Excellence Laboratory.

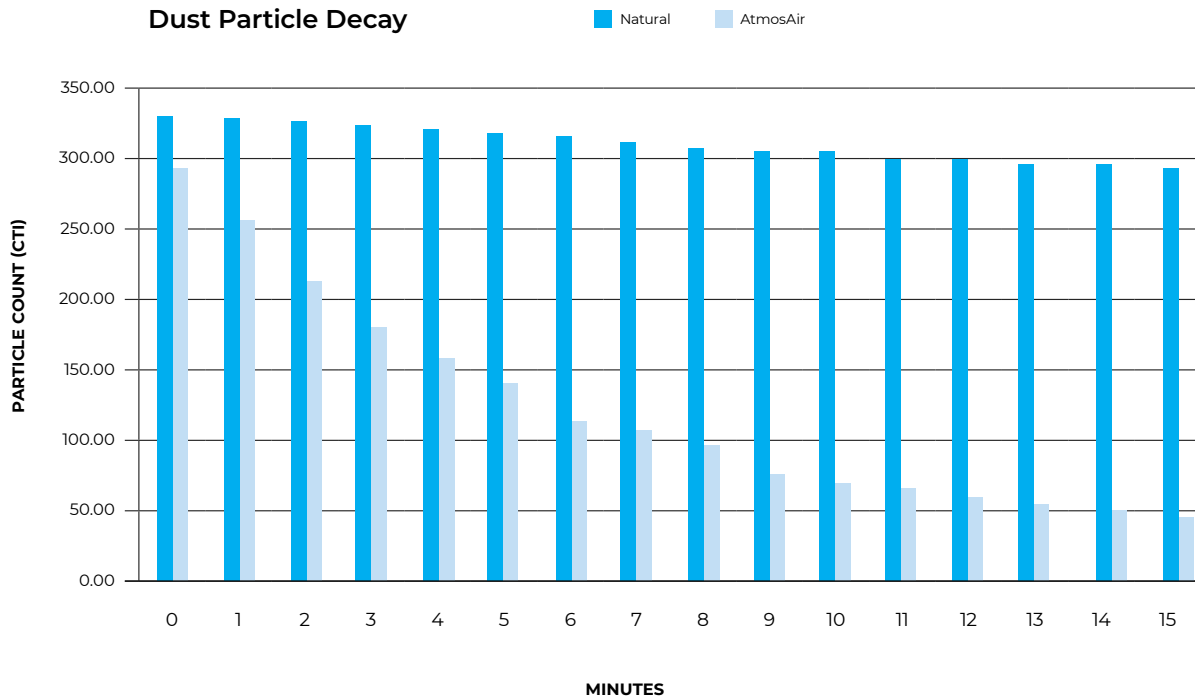
Time from turn on AC (hr)	hexane	2-butanone	iso-butanol	toluene	tetrachloroethylene	hexanal	ethylbenzene	decane
0.000	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
0.225	87.4%	84.3%	68.6%	87.1%	88.7%	79.6%	89.4%	93.7%
1.008	63.9%	63.8%	32.1%	57.4%	61.1%	36.9%	58.9%	65.6%
2.008	43.6%	36.6%	20.9%	31.9%	40.0%	12.9%	34.0%	36.3%
4.075	21.1%	25.7%	9.4%	11.2%	18.8%	5.1%	11.0%	12.4%



Study Conclusion

Test results showed good regression and repeatability between the two duplicate tests. Test indicated that AtmosAir air cleaners reduced the concentrations in the chamber air (57.12 m³ in volume) for Hexane by 94.6%, 2-Butanone by 91.1%, Iso-butanol by 97.1%, Toluene by 98%, Tetrachloroethylene by 94.5%, Hexanal by 97.5%, Ethylbenze by 96.3% and Decane by 96.4% over the 6 hours pull-down test period. These corresponded to the equivalent clean air delivery rate (CADR) for the two units tested to range from 12 cfm to 22.5 cfm, depending of the VOCs.

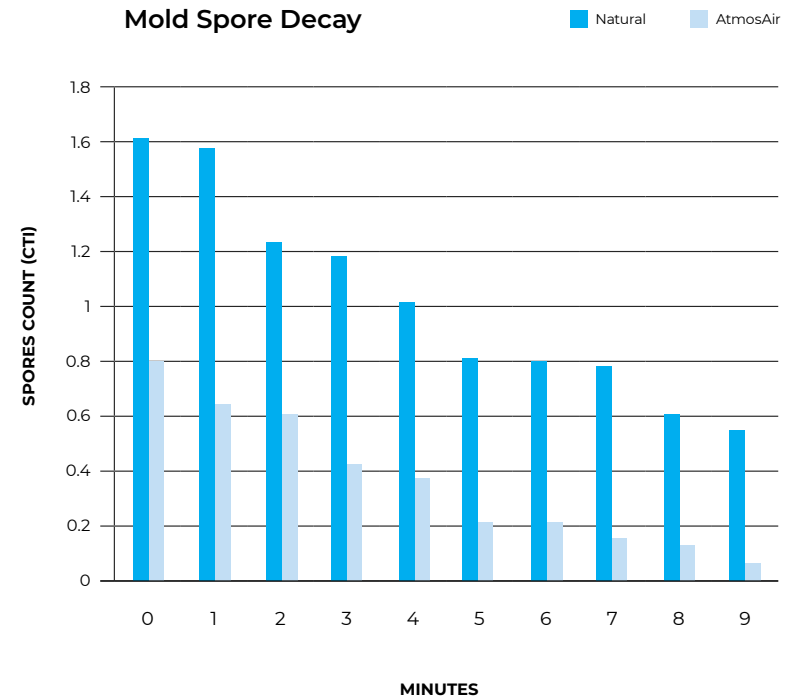
Clean Air Delivery Rate (CADR) Test vs. Particulate Matter (0.3 Micron)



Clean Air Delivery Rate Testing - Third Party Testing Against Particulate Matter (PM) with ETL.

Study Summary

To an ANSI and AHAM structured CADR test vs. ultra-fine particulate matter (PM0.3), AtmosAir proved to reduce particles by 86% relative to natural dissipation within 15 minutes. AtmosAir tested to a 125 Dust CADR and a 158 test CADR.



AtmosAir Mold Clean Air Delivery Rate (CADR) Testing at ETL Labs.

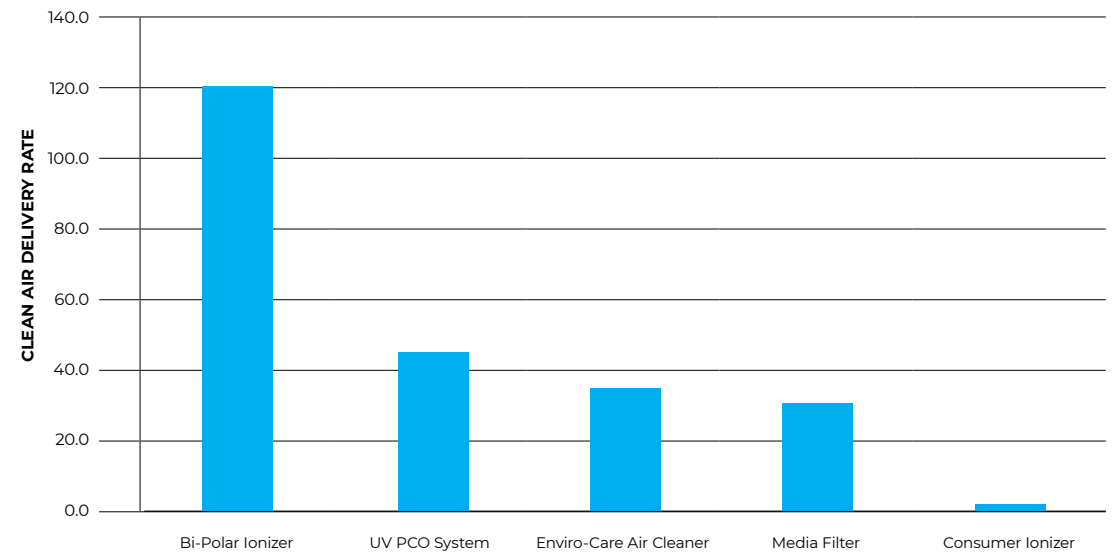
CADR Comparison

Air Cleaner Test Results (CADR)

Product	CADR Rating	BPI variance
AtmosAir D100	125	n/a
Lennox Healthy Climate PCO-12C	47.4	264%
Honeywell Enviro-Care F300E	35.8	349%
White-Rodgers SST 1000	27.2	460%
Sharper Image Ionic Breeze	4.8	2604%

Report Intertek, ETL Semko

3033 US Route 11 Cortland, New York 13045



Third Party Testing

Global Full Service Hospitality Brand

Test Result:

Test by Corporate Engineering team saw an average of a 75% reduction of airborne spores after AtmosAir was installed in the rooms that they tested.

Test Background:

AtmosAir was asked to measure the effect of their air purification systems on the Indoor Air Quality (IAQ) for a number of guest rooms in blind study. AtmosAir bi-polar ionization air purification systems were installed into the fan coil units that serve each room. Air quality measurements were taken both before systems were installed and with the AtmosAir systems operating.

Third party testing was contracted by a global hospitality brand. Testing was completed by Air Quality Assessors of Florida (AQA).

Test Type	Room #	Before	After	Reduction %
RAW Count Mold Spores	2540	110	41	64%
	2327	926	9	99%
	1836	275	20	89%
	1074	19	11	42%
	555	62	12	82%
Outdoor Air	n/a	1	20	n/a
Spores/m ³	2540	1467	547	63%
	2327	12347	120	99%
	1836	2333	267	89%
	1074	253	147	42%
	555	827	169	81%
Outdoor Air	n/a	13	276	n/a
TVOC's	2540	3700	1400	62%
Mold VOC's	2540	7	5	29%

Testing - Number 1 Healthcare Institution in the USA - Rush University Medical Center, Chicago Illinois

AtmosAir's Effects on Microorganisms

Testing by EMSL Laboratories

Bacteria Type	Before AtmosAir (CFU/M3)	After AtmosAir	% Difference
Bacillus Flexus	14	ND	-100%
Bacillus Marisflavi	7	ND	-100%
Kocuria Rosea	28	ND	-100%
Micrococcus Luteus	49	ND	-100%
Staphylococcus Lugdunensis	140	ND	-100%
Total	238	ND	-100%

Test Result

Leading Medical Center and University bacteria sampling results showing bacteria measurements that are so low that they are considered undetectable.

AtmosAir's Effects on Microorganisms

Major Grocery Store - New York City, NY

Reduction of microorganisms will result in less possibility of transmission of illness and allergic symptoms and allergic symptoms, in addition to having positive impact on exposed perishable food items.

The AtmosAir systems before & after tests of IAQ were both taken in below two venues.

A New York City grocery store's main front end area of the store had a reduction of bacteria up to 80% while the fungi was found non-detectable.

Bacteria/ Fungi	Pre AtmosAir	Post AtmosAir	% Difference
Bacillus licheniformis	2 CFU	ND	-100%
Kocuria sp.	10 CFU	ND	-100%
Staphylococcus saprophyticus	6 CFU	ND	-100%
Total Bacteria Colony Count	20 CFU	4 CFU	-80%
Fungi			
Cladosporium herbarum	1	ND	62%
Total Fungi	1	ND	29%

*CFU: ND.

Dagostinos's Market on 1507 York Ave, New York, NY. Across from the deli section in a grocery aisle. The reduction of bacteria is up to 57% while the fungi was found non-detectable.

	Pre AtmosAir	Post AtmosAir	% Difference
Bacteria Total Colony Count	27	3	-57%
Bacteria CFU	49	21	-57%
Fungi Total Colony Count	1	ND	-100%
Fungi CFU	7	ND	-100%

*ND=Not detectable

AtmosAir's Effects on Microorganisms

Bangkok Bank Headquarters

The test was conducted by third party for major bank's headquarters in Bangkok, Thailand to see the difference before and after the installation of AtmosAir systems.

Space		Bacteria cfu/m ³
Floor 7 - Office	Before	>1307
	After	234

▲ 1st TEST – office on 7th floor reduced at least 82%.

▶ 2nd TEST – Reductions show in almost all index after the installation of AtmosAir. Especially the highlighted bacteria and mold data, the bacteria on 3rd floor Building One reduced at least 92.7% while the mold on 20th floor Building Two reduced at least 67%.

Space		PM2.5	Bacteria cfu/m ³	Mold cfu/m ³
Building One				
Floor 3 - Office	Before	36	>1307	107
	After	14	95	107
Building Two				
Floor 2 - Office	Before	22	107	86
	After	8	53	59
Floor 12 - Call Center	Before	26	158	92
	After	11	131	71
Floor 17 - Office	Before	26	162	102
	After	13	146	73
Floor 20 - Office	Before	27	282	146
	After	15	95	48
Singapore Standard		36	500	500

The Difference is the Technology

AtmosAir vs. Competing IAQ Technologies

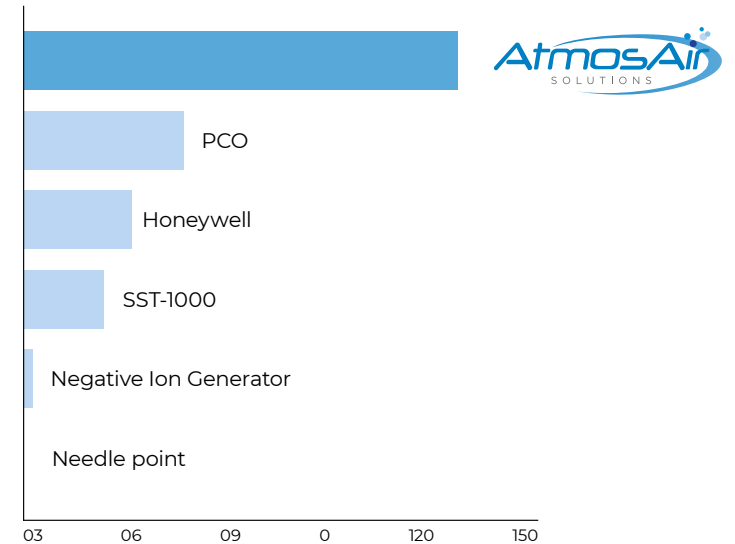
- Clean Air Delivery Rate (CADR) is a standard developed by ANSI (American National Standards Institute) and AHAM (American Home Appliance Manufacturers).
- CADR is used to measure a product's effectiveness on particle removal within a space.



Source: ETL Testing Laboratories

Manufacturer/Technology	CADR Rate	Variance from AtmosAir (%)
AtmosAir Bi Polar Ionization (BPI)	125	n/a
Photocatalytic Oxidation (PCO)	47.4	264%
Honeywell Electronic Air Cleaner	35.8	349%
Electrostatic Air Cleaner	27.2	460%
Negative Ion Generator	4.8	>2500%
Needlepoint Ionization	0.4	>2500%

CADR = Clean Air Delivery Rate



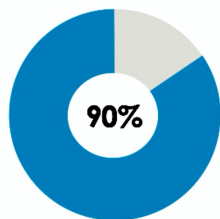
ProMedUSA+AtmosAir vs. Other IAQ Technologies

	 Bi-Polar Ionisation	Media (HEPA) Filtration	UV	Photo-Catalytic Oxidation (PCO)	Needlepoint Ionization	Carbon Filters	Electronic Air Cleaners
Active or Passive Technology	Active	Passive	Passive	Passive	Passive	Passive	Passive
Deactivates Contaminants / Pathogens in the room itself	Yes	No	No	Yes	No	No	No
Reduces Odours	Yes	No	No	No	No	Yes	No
Reduces VOC's	Yes	No	No	No	Yes	Yes	No
Reduces Particles	Yes	Yes	No	No	No	Yes	Yes
Effective on Viruses, Bacteria and Germs	Yes	No	Yes	Yes	Yes	No	No
Produces Ozone	No	No	Yes	Yes	No	No	Yes
Low Pressure Drop	Yes	No	Yes	Yes	Yes	No	Yes
Maintenance	Every 2 Years	Quarterly	Yearly tube replacement and frequent tube cleaning required	Yearly	6 months - 2 years	Monthly	Monthly
Re-engineering of HVAC system needed	No	Yes	No	No	No	Yes	Yes
New Design and Retro-Fit Applications	Yes	No	Yes	Yes	Yes	No	No
Reduces Energy Costs	Yes	No	Yes	Yes	Yes	No	No
No Chemicals or Bi-Products	Yes	Yes	No	No	Yes	No	Yes
Tested Contaminant Reductions in Occupied Space	Yes	No	No	No	No	No	No
Published and Peer Reviewed Research	Yes	Yes	Yes	Yes	No	Yes	Yes
"Smart" System Available (Integrated with sensors & monitors)	Yes	No	No	No	No	No	No

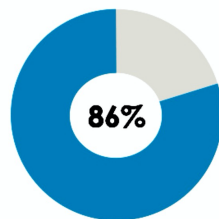
AtmosAir Bi-Polar Ionisation Tests and Certifications

- US EPA US Energy Star Certification
- Underwriters Laboratories UL 867
- Underwriters Laboratories UL 1995
- Underwriters Laboratories UL 2998
- EU Standard EN 60335-2-40:2003
- EU Standard EN 61000-6-3:2001
- EU Standard EN 61000-6-1:2001
- EU Standard EN 60204-1:2006
- OPA 2807-10
- OPA2808-10
- ANSI / AHAM AC-1 2002
- ASHRAE 62.1 IAQ Procedure Compliant
- 125 DUST CADR
- 190 MOULD CADR

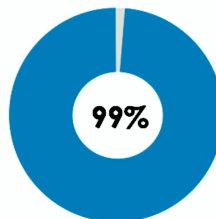
AtmosAir - Independently Tested and Verified Under Real World Conditions



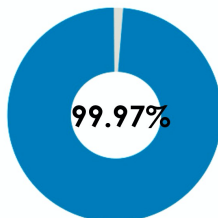
Reduction in VOC's
Source: Univ. of Syracuse 2019



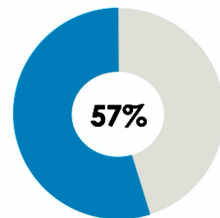
Reduction in PM0.3
Source: ETL CADR Testing



Reduction in E.Coli and MRSA
Source: ATL Labs, 2016 - 45 Minute Exposure



Reduction in Human Coronavirus Strain 229E, ATCC VR-740 in 30 Minutes
Source: Microchem Laboratory June 2020



Reduction in C.Diff
Source: ATL Labs, 2016 - 6 Hr exposure



UL 2998

Verified Zero Ozone Production



VERIFIED
ZERO OZONE

Intertek does hereby certify that an independent assessment has been conducted on behalf of

ATMOSAIR

Certificate Number

104404620GRR-001

Certification Issued

18 September 2020

Initial Verification Date

18 September 2020

Certificate Valid Until

17 September 2021

Applicant Address

418 Meadow Street, Suite 204
Fairfield, CT 06824 USA

Product Category

Appliances & Electronics, Air Cleaners

Product Details

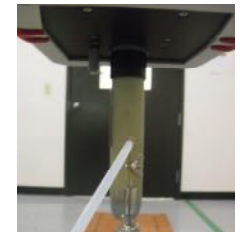
See Appendix

Conformance Criteria

Conforms to UL 2998 (3rd Edition, July 10, 2020) clause 6.2, emittance of ozone not exceeding a concentration of 0.005 ppm.

Issuing Office Name & Address

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