

AirROS Case Study

3217 Ramos Circle Office Building

November 1, 2021
Lawson Mechanical Contractors



WHAT IS AIRROS

LATEST IN SCIENCE & TECHNOLOGY TO QUICKLY AND EFFECTIVELY SANITIZE ALL AREAS AND SURFACES!

- ✓ *DESTROY VIRUSES*
- ✓ *REDUCE CROSS-CONTAMINATION*
- ✓ *EMPLOYEE & CUSTOMER SAFETY*
- ✓ *PURIFY SURFACES & AIR*
- ✓ *DEFEND YOUR BUSINESS*
- ✓ *ODOR REDUCTION*



More importantly than ever is the need to prevent and eliminate viruses, bacteria, mold, and other VOCs in the air and on surface areas. AirROS is an industrial surface and air purification solution that provides a clean and safe environment for your business.

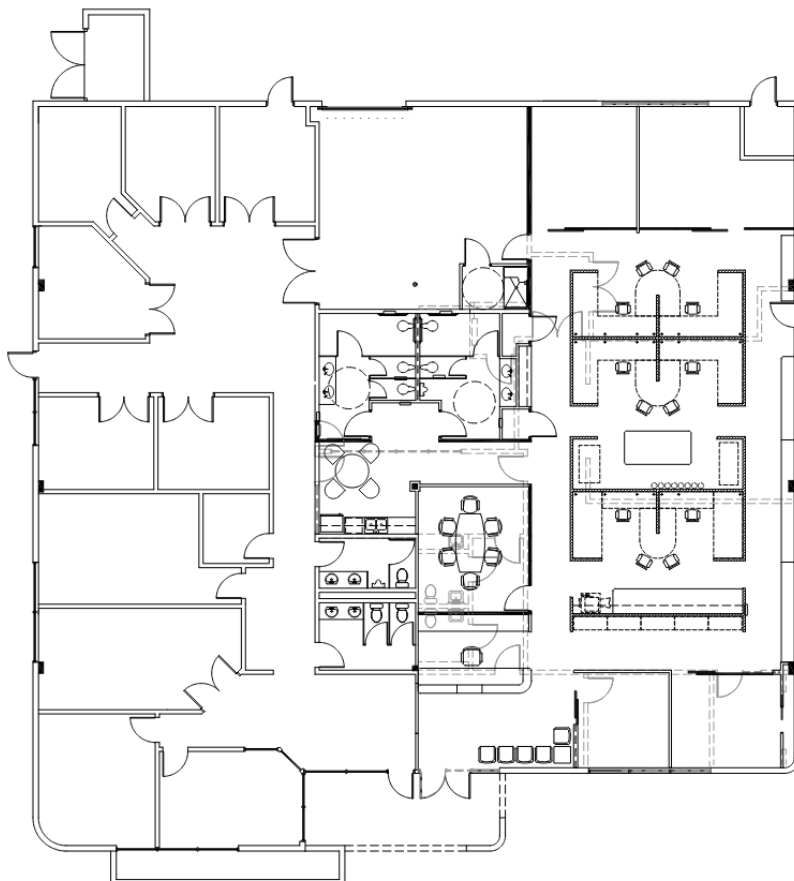
AirROS provides safe, effective, and continuous 24/7 inactivation and neutralization of airborne and surface viruses, microbials, and odors while staff and customers are present within your facility. Most devices that kill viruses, such as Coronavirus (COVID-19), are dangerous while in operation because they produce harmful Ozone exhaust in a way that is harmful to employees and guests. AirROS purifiers operate at extremely low levels and keep customers, employees, and guests safe from exposure to viruses, bacteria, and biologicals. Therefore, limiting liabilities and ensuring peace of mind that our clients are ready for any future exposure risks.



Due to the increase in safety and environmental concerns since the outbreak of COVID-19, Lawson Mechanical decided to install the AirROS product at one of our office locations. Our goal was to substantiate the manufacturers claims with regards to the remediation of airborne and surface pathogens in an environmental setting. A third party environmental firm was contracted to perform the air and surface sampling and testing. The AirROS product held up to its claims, providing a highly impressive 95% reduction in bio-burdens and odors.

COMMERCIAL OFFICE SPACE

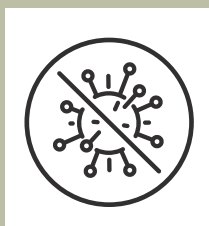
Square Footage:	3500 sq. ft. / 42,000 cu. ft.
Occupancy (Daily):	15-25 People
Open Floor Plan:	Multiple Desks & Working Surfaces
Private Offices:	Four (4) + Conference Room
Outside Influence:	Multiple doors, three (3) provide traffic in and outside, equipment economizers
Environment:	Surrounded by mature trees, plants, flowers, and close to freeway (exposure to natural and manufactured bio-burdens)
HVAC Equipment:	Four (4) Package Units with Economizers (12 tons)



3217 RAMOS CIRCLE

AIRROS INSTALLATION

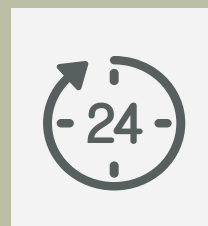
COMMERCIAL IAQ SOLUTION ADVANCED SURFACE & AIR PURIFICATION



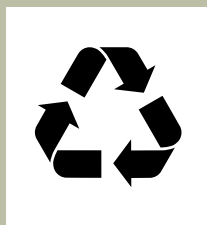
Proven kill rate of 99.99997% of surfaces & air in just under 15 minutes



Meets standards of OSHA, ACGIH, WHO, FDA, EPA & USDA. Safe & Effective.



Runs 24/7 actively cleaning the environment. Produces no residues or odors.



Organic, sustainable, & made with recyclable consumable.



Cost-efficient, ultra low energy consumption, & low maintenance.

INSTALLATION DETAILS AT 3217 RAMOS CIRCLE

AirROS Units:	4004XX and 4007XX
Quantity of Units:	Two (2)
Electrical Requirements:	115 volts (plug)
Installation Time:	1-2 hours each (power accessible)
Mounting:	Mounted AirROS equipment to air conditioning supply duct, four (4) bolts, cut two 3-inch access holes on supply air duct (putting AirROS inline). Installed and sealed 3-inch pipe allowing sample air through equipment.
Controls:	Run stat wire and installed sensor in common area 4-5 feet above ground
Warranty:	Twelve (12) Months
Maintenance:	Annual Recommended

Pre-test Date:

Results Air:

Target CFU:

Condition:

PRE-TEST AIR

04/13/2021

493 CFU/m³

<100 CFU/m³

Not Acceptable (Needs Attention)

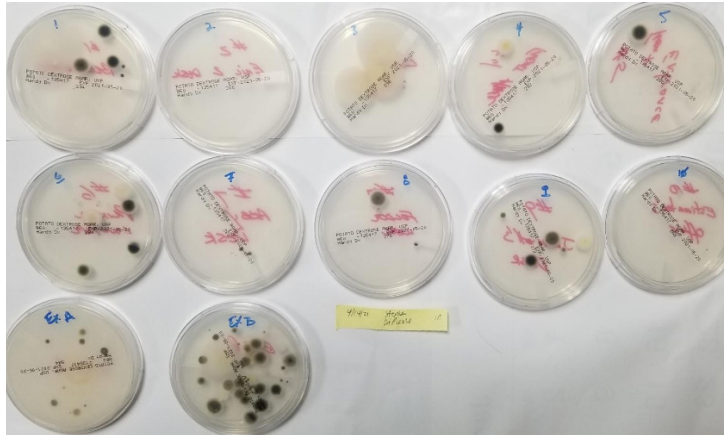
PRE-TEST SURFACE

04/13/2021

8 CFU/cm²

<5 CFU/cm²

Marginal (Needs Attention)



AIRROS INSTALLATION

Install Date:

08/20/21

Post-test Date:

09/20/2021

Results Air:

21 CFU/m³

Target CFU:

<100 CFU/m³

Condition:

Safe Clean Environment

Variance:

95.7% Improvement

POST-TEST SURFACE

09/20/2021

0.4 CFU/cm²

<5 CFU/cm²

Safe Clean Environment

95% Improvement



CFU = Colony Forming Units

TESTING & RESULTS



Lawson Mechanical Contractors
3217 Ramos Circle
Sacramento, CA 95827

September 27, 2021

Pre and In-treatment Air and Surface Report – Service and Special Projects, Sacramento, CA

A. Summary – Air Samples

Pre and In-treatment air samples results are given below.

Sample Date	Treatment	Number of samples	Location	Average (cfu/m ³)	Range	Standard Deviation	Percent Reduction
04/13/21	Pre	10	Various	493	133/733	166.5	-
09/20/21	In	9		21	0/67	23.2	95.7
04/13/21	Pre	2	Exterior	1,017	967/1,067	50.0	-
09/20/21	In	1		1,467	1,467/1,467	0.0	+ 30.7

Sampling

All air samples were taken via the MB-1 air sampler, 30 liters per sample throughout the various locations given above. Results normalized to colony forming units per cubic meter of air (cfu/m³) Calculation: CFU/m³ = 1,000 × n_c / v_s where n_c is the corrected number of colonies counted and v_s is the sample volume in liters

Given below are the airborne organisms found during **04/13/21, pre-treatment** sampling, excluding outside samples.

Species	Raw Count	Species	Raw Count
<i>Aspergillus fumigatus</i>	1,180	<i>Cladosporium sphaerospermum</i>	520
<i>Penicillium, aspergillus types</i>	1,055	<i>Absidia, spp</i>	320
<i>Penicillium purpurogenum</i>	880	<i>Mortierella, spp</i>	200
<i>Penicillium purpurascens</i>	670	<i>Basidiospores spp</i>	110

Shown below are the airborne organisms found during **09/20/21, in-treatment** sampling, excluding outside samples.

Species	Raw Count	Species	Raw Count
<i>Aspergillus fumigatus</i>	85	<i>Cladosporium sphaerospermum</i>	< 5
<i>Penicillium, aspergillus types</i>	50	<i>Absidia, spp</i>	< 5
<i>Penicillium purpurogenum</i>	32	<i>Mortierella, spp</i>	< 5
<i>Penicillium purpurascens</i>	< 5	<i>Basidiospores spp</i>	< 5

04/13/21 - Pre-treatment samples from the various locations ranged from 133 to 733 cfu/m³ which is > 300 cfu/m³ and is **not acceptable**, needs corrective action.

09/20/21 - In-treatment samples showed a **95.7% reduction** the various locations ranging from **0** to **67 cfu/m³** which is < 100 cfu/m³ and considered **clean and acceptable**.

Observations

The exterior air samples ranged from **967** to **1,467 cfu/m³** and reveals that most of the interior bioburden is attributed to the outside air. The treatment system continues to reduce the indoor bioburden even with a **31% increase** in the exterior count.

Target Air Quality

Air quality scale for workplaces, public buildings, schools, and homes are as follows:

- < 100 cfu/m³ is considered **clean and acceptable**.
- 100 to 300 cfu/m³ is **marginal**.
- > 300 cfu/m³ is **not acceptable** and needs corrective action.

In most cases, air quality < **100 cfu/m³** has shown a decrease in the overall bioburden and odors.



Predominant Microorganisms

Although the predominant organisms noted in this report are fungi, previous testing results show bacteria, viruses and protozoa are eliminated as effectively as fungi. The oxidizing molecules generated are effective on gram +, gram – bacteria, protozoa, spores and viruses.

B. Summary – Surface Contact Swabs

Pre and In-treatment surface (swab) samples results given below.

Sample Date	Treatment	Number of samples	Location	Average (cfu/cm ²)	Range	Standard Deviation	Percent Reduction
04/13/21	Pre	5	Various	8.0	7.1/9.5	0.8	-
09/20/21	In			0.4	0.2/0.5	0.1	95.0
04/13/21	Pre	1	Negative Control	0	0/0	-	-
09/20/21	In			0	0/0	-	-

04/13/21 - Pre-treatment surface swab results range from 7.1 to 9.5 CFU/cm² at the various locations and is considered marginal.

09/20/21 - In-treatment surface swab results gave a **95% reduction** and range from **0.2 to 0.5 CFU/cm²** in the sampled locations and are now are < 5 cfu/cm² which is considered **clean and acceptable**.

Target Contact Surface Quality

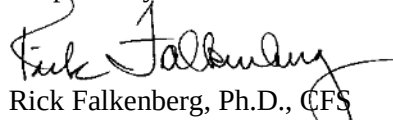
Contact surface quality scale for workplaces, public buildings, schools, and homes are as follows:

- < 5 cfu/cm² is considered **clean and acceptable**.
- 5 to 10 cfu/cm² is considered **marginal**.
- > 10 cfu/cm² is considered **not acceptable** and needs corrective action.

In most cases, surface swabs < **5 cfu/cm²** has shown a decrease in the overall bioburden and odors.

Please contact me if there are questions or if further information is needed.

Respectfully submitted,


Rick Falkenberg, Ph.D., CFS
Senior Principal Scientist