

Expanding Roots Inc.
Microbusiness with Cultivation, Manufacturing, Distribution, & Retail

Odor Mitigation Plan

RECEIVED

By Andrew Trippel at 1:51 pm, Dec 31, 2018

As required by Section 20-46.050(H) of the City Ordinance, Applicant will have a comprehensive odor mitigation plan. Odor mitigation will be accomplished through the use of carbon filtration throughout the facility, to ensure no cannabis odors escape the facility. Applicant recognizes that the City requires that this odor mitigation plan must be certified by a licensed professional engineer to ensure that all mitigation controls are sufficient to effectively mitigate odors from all odor sources (City Ordinance Section 20-46.050(H)). Applicant contracted with TEP Engineering to ensure that its odor mitigation controls are sufficient to effectively mitigate odors from all odor sources. Please see the attached certified letter from Andy Souza of TEP Engineering.

Applicant will install the following fans and activated carbon filtration systems:

Odor Mitigation System Locations				
Key & Type	A: 14-Inch Can-Fan Max Fan <i>with</i> 14-Inch Activated Carbon Filter (1700 CFM)	B: 10-Inch Can-Fan Max Fan <i>with</i> 10-Inch Activated Carbon Filter (1100 CFM)	C: 6-Inch Can-Fan Q-Max Fan (Quiet) <i>with</i> 6-Inch Activated Carbon Filter with HEPA Outlet (400 CFM)	D: 14-Inch Can-Fan Max Fan <i>with</i> 14-Inch Activated Carbon Filter (1700 CFM) Vented to Exterior
Location (Number of Systems)	Grow 1 (2)	Commercial Kitchen (1)	Retail (1)	Ship/Rec (1)
	Grow 2 (2)	Manufacturing (1)	-	-
	Mother/Clone (1)	-	-	-
	Drying (1)	-	-	-

(see attached Odor Mitigation/Filtration Floor Plan for the location of all filtration units)

Example of 10-inch Max-Fan with Carbon Filter and Speed Controller



Can-Fan
Can-Fan Max-Fan Inline Mixed Flow Fan, 14-Inch 1700 Cubic Feet Per Minute



How Carbon Filters Work

A carbon filter is a round, hollow device with a membrane that contains activated charcoal (carbon). “Dirty” air passes through the carbon filter and clean, odorless air exits the other side. Carbon filters are the most popular odor control option on the market because they are highly effective, widely available, and low maintenance. Granular Activated Carbon charcoal is so effective because of its high degree of micro-porosity. Carbon filters are low maintenance and with a proper pre-filter, Applicant will only have to change the activated carbon every 12 to 18 months, although this can vary based on variables such as fan speed, hours of use, carbon quality, etc.

Purpose and Utility of Carbon Filters

As stated above, the carbon filters utilized on-site will filter the air in the facility approximately ten (10) times per hour. This will reduce irritants for employees, customers, and neighbors of the facility. Additionally, Applicant will cultivate in several smaller rooms within the facility. This will add an additional layer of odor control, because each small room will have its own carbon filtration and fan systems, as well as insulation to control the spread of odor throughout the facility. Fans within each room at the facility will create air circulation to avoid stagnant areas where odors can collect. Applicant’s air filtration system will be properly maintained in accordance with industry standards to ensure appropriate air quality. In addition to the Odor Mitigation fans and carbon filtration systems, Applicant will utilize “Element Air” air purification systems, which reduce airborne and surface microbial contaminants, as well as reduce cannabis terpenoids and other odors (*see Element Air Brochures for further information*).

Location of Applicant’s Carbon Filters

Odor mitigation systems will be operational at all times cannabis is present within the facility. All fans and filters will be sized to exchange air approximately ten (10) times per hour. The carbon filters will be located within the rooms or above the ceilings in the attic area. The filtration systems will be pass-through and will not be vented to the outside of the facility, with the exception of Filtration Unit D within the Distribution Area (*see attached Odor Mitigation/Filtration Floor Plan for the location of all filtration units*).

Staff Training

Applicant understands how important it is that odor does not escape Applicant’s facility. As such, Applicant will ensure all staff is appropriately trained to understand how the carbon filters work and to ensure all filters are running appropriately at all times. Applicant will also train specific staff to accurately inspect odor mitigation equipment daily, to confirm that all equipment is working properly. Upon finding that any of the odor mitigation equipment is not working properly, Applicant’s staff will immediately act to repair the malfunctioning unit or to contract an appropriate repair company to undertake such repair.

WRITTEN DIMENSIONS ON THESE DOCUMENTS SHALL HAVE PRECEDENCE OVER SCALED DIMENSIONS.
CONTRACTOR SHALL VERIFY AND BE RESPONSIBLE FOR ALL DIMENSIONS AND CONDITIONS OF THE JOB.

REVISIONS	BY

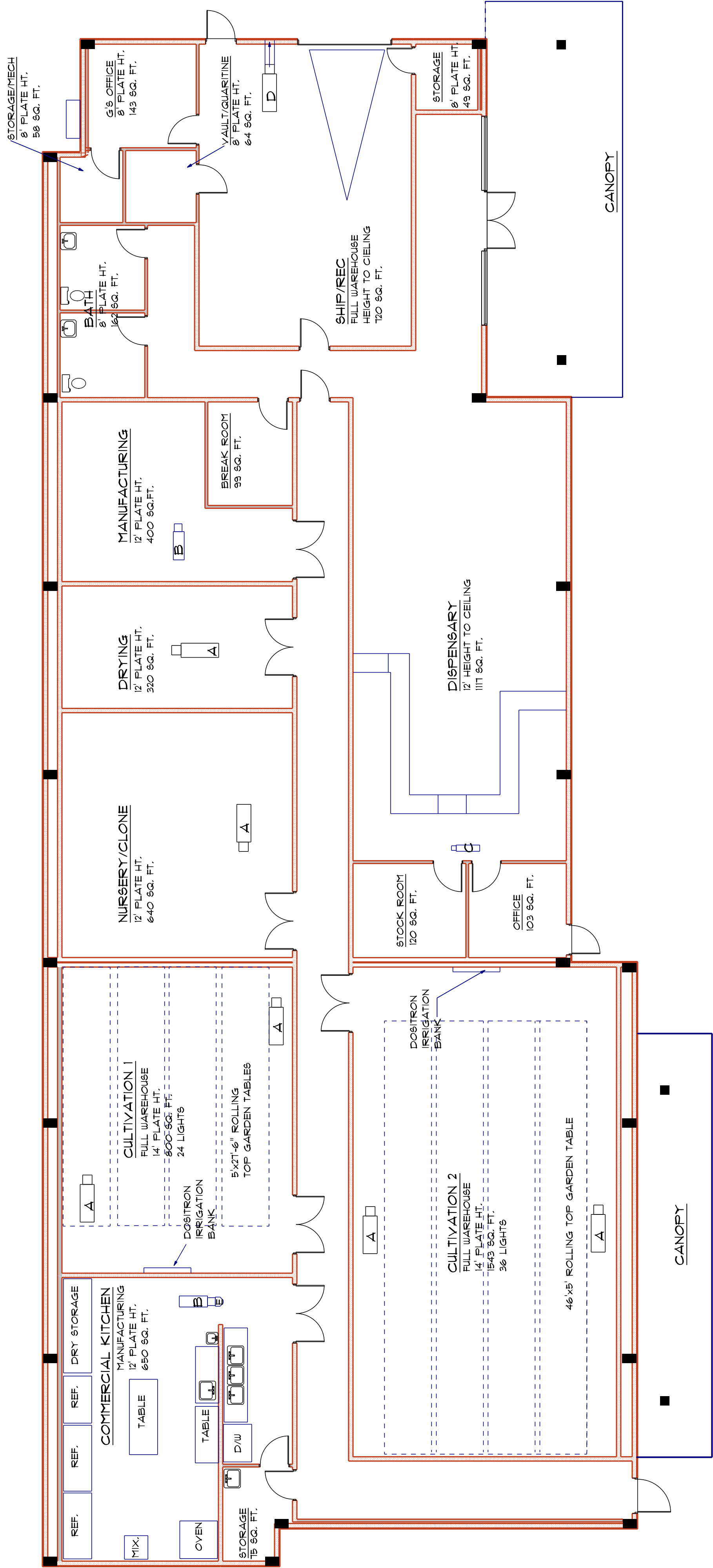
NEALE B. PENFOLD
Professional Civil Engineering
2101 First Street
Eureka, California 95501
(707) 442-4587

For:
GRANT BABBIT
1330 Diamond Mountain Rd.
Calistoga, CA 95451b

EXPANDING ROOTS
3499 INDUSTRIAL DRIVE
SANTA ROSA, CA
APN: 015-650-022

Date:	3/18
Scale:	AS NOTED
Drawn:	BDR
Job:	.

SHEET NUMBER
MF102



FILTRATION PLAN
SCALE: 1/8" = 1'-0"
NORTH

NOTES:

SHELL MITIGATION SHALL BE ACCOMPLISHED BY CARBON FILTRATION OF ALL CULTIVATION, PROCESSING AND ACCESSORY AREAS TO ENSURE NO SHELL ESCAPES THE BUILDING ENVELOPE. FANS AND FILTERS ARE SIZED TO EXCHANGE AIR 10 TIMES PER HOUR.

CULTIVATION ROOMS ARE TO BE SEALED ROOMS SUPPLEMENTING CO2 AND HEATED/COOLED WITH GUEST MINISPLIT UNITS. ROOM ENVIRONMENT IS TO BE CONTROLLED TO PREVENT MOULD, POLLUTANTS, AND OTHER PATHOGENS FROM ENTERING CULTIVATION AREAS.

CARBON FILTRATION SHALL BE PASS-THROUGH AND NOT VENTED TO OUTSIDE OR OUTSIDE CARBON FILTRATION SHALL BE PASS-THROUGH AND NOT VENTED TO OUTSIDE OR OUTSIDE PROVIDED ADEQUATE RETURN AIR TO BALANCE PRESSURE.

FILTRATION TO BE OPERATIONAL AT ALL TIMES CANNABIS IS PRESENT IN ROOM OR BUILDING.

FILTER KEY

- A 14" CANFAN 1700 CFM MAX FAN W/ 14" ACTIVATED CARBON FILTER
- B 10" CANFAN 1100 CFM MAX FAN W/ 10" ACTIVATED CARBON FILTER
- C 6" CAN FAN 400 CFM G-MAX (QUIET) FAN W/ 6" ACTIVATED CARBON FILTER W/ HEPA OUTLET VENTED TO EXTERIOR
- D 14" CANFAN 1700 CFM MAX FAN W/ 14" ACTIVATED CARBON FILTER
- E EXHAUST HEPA FILTER

June 12, 2018

Re:
Grant Babbitt
3499 Industrial Drive,
Santa Rosa, CA 95403
Cannabis Cultivation, Distribution, Manufacturing and Retail
City of Santa Rosa –
Conditional Use Permit Application

As required by the City of Santa Rosa's Cannabis – Conditional Use Permit Application, the Owner has hired TEP Engineering to address three items regarding HVAC filtration and noise. These three items are "Storage of Cannabis Products/Inventory", "Odor Control – Engineering Controls" and "Noise".

Dual EHS Permitting - Storage of Cannabis Products/Inventory

The project as proposed shall comply with the City of Santa Rosa's storage of cannabis products/inventory standards set forth in Zoning Code Chapter 20-46. Grant Babbitt will store and display packaged edible cannabis goods in spaces that have temperature and humidity controlled heating, ventilation and air conditioning (HVAC) systems. The outside and recirculated air for these HVAC systems will include filters that mitigate environmental contaminants such as smoke and dust. These filtration systems must be specified and sized properly by a Professional Mechanical Engineer and maintained by the Owner per the manufacturer's instructions. The area in which edible medical cannabis goods are stored also may not be exposed to direct sunlight.

Odor Control – "Engineering Controls"

The project as proposed shall comply with the City of Santa Rosa's odor mitigation standards set forth in Zoning Code Chapter 20-46. The industry accepted method to remove cannabis odors for exhaust airstreams is carbon filtration. Grant Babbitt will install activated carbon filter canisters or inline filters on their exhaust systems serving spaces at risk for emitting cannabis odors. Grant Babbitt will also install activated carbon inline filters on their recirculating air systems serving spaces at risk for emitting cannabis odors. These carbon filters are designed for the control of VOC's, odors and other gaseous contaminants. The spaces at risk for emitting cannabis odors are noted on the odor-control floor plan provided by Grant Babbitt; these spaces include the Dispensary, Stock Room, Ship/Rec, Vault/Quarantine, Manufacturing, Drying, Nursery/Clone, Cultivation 1, Cultivation 2 and Commercial Kitchen. The exhaust and recirculated air for these spaces will pass through an activated carbon filter, which uses chemical adsorption to remove organic compounds from the airstream. These organic compounds carrying the cannabis odor are captured through a process of adsorption in the microporous carbon. The activated carbon filtration systems must be sized properly by a Professional Mechanical Engineer and maintained by the Owner per the manufacturer's instructions. Suitable activated carbon filters manufacturers include: Camfil, Can-Filters Canada, Purafil or approved equivalent by a Professional Engineer.

Noise

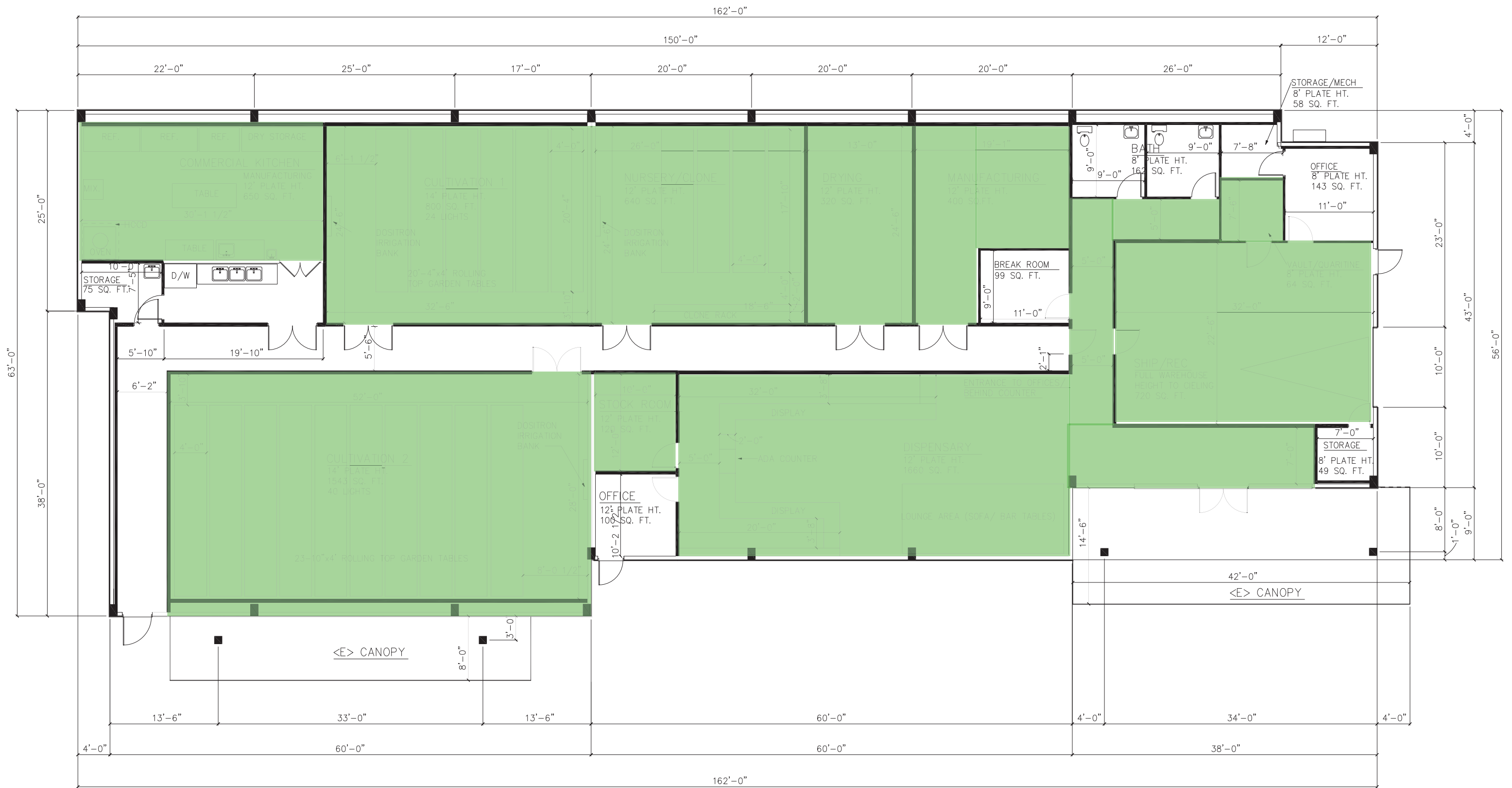
HVAC equipment shall comply with the City of Santa Rosa's Chapter 17-16 (Noise) requirements. These HVAC systems must be specified and sized properly by a Professional Mechanical Engineer and maintained by the Owner per the manufacturer's instructions.

Sincerely,



TEP Engineering
Andrew Souza, P.E., CPD, GPD, LEED AP BD+C





 SPACES AT RISK FOR EMITTING CANNABIS ODORS

COPYRIGHT MATERIALS RELEASE- To the extent that your application submittal packet includes plans or drawings prepared by a licensed, registered or certified professional, as defined pursuant to the California Health and Safety Code Section 19851 or Business and Professions Code Section 5536.25, such as a licensed engineer, architect or other design professional, the City must first obtain the signature release and permission of said professional prior to publication or reproduction of any such plans or drawings. Such drawings and plans may also be protected by copyright laws. The City of Santa Rosa hereby requests permission to reproduce and publish plans and drawings submitted with your application packet for purposes of more effectively and efficiently facilitating the entitlement review process, including making plans and drawings available on the City's website for public review and providing electronic reproductions to the City's review boards. The purpose of this request is limited solely to the purpose of facilitating the timely review of this application, and the plans and drawings will not be utilized by the City for other purposes. To assist the City in this process, please provide below the signatures of all of those who have prepared plans and drawings to be submitted with this application. **PROJECT: 3499 INDUSTRIAL DRIVE**

Engineer Name: ANDREW SOUZA, P.E. (MECHANICAL ENGINEER)
Phone: 707-538-0400
Email Address: andy@tep.net

ENGINEER /SURVEYOR'S SIGNATURE Andy Souza

Architect Name: _____
Phone: _____
Email Address: _____

ARCHITECT/DESIGNER'S SIGNATURE _____

Landscape Architect Name: _____
Phone: _____
Email Address: _____

LANDSCAPE ARCHITECT/DESIGNER
SIGNATURE _____

12/2015

Element Air[™]

Air Purification Systems

PROTECTING YOUR GROW

Our patented Element Air treatment systems are the most practical and effective solutions for airborne and surface microbial contaminants, including powdery mildew, total yeast and mold (TYM) and *Cannabis* odors. Element Air has been independently verified to reduce bacterial and other microbial contaminants by 99+%.

The Element Air technology utilizes broad spectrum, high-intensity UV lights targeted on a hydrated quad-metallic catalyst which utilizes ambient moisture to generate hydro-peroxides and hydroxides that are propelled into the cultivation facility, to provide active microbial and odor mitigation.

As opposed to other units promoted to the *Cannabis* market which utilize a similar technology, Photocatalytic Oxidation (PCO), which only sanitize the air that is passed directly in its path, Element Air is an active purification system. It purifies the ducts and general growing spaces, while also removing odor at the source.

BENEFITS OF ELEMENT AIR SYSTEMS:

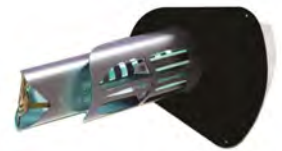
- Several different module types
- Reduce airborne microbes by 99%
- Reduce airborne VOC's, including airborne *Cannabis* terpenoids and other odors
- Helps eliminate airborne bacteria, mold and odors
- Actively "scrubs" ducting, air and surfaces with airborne hydro-peroxides
- Completely safe for workers and plants
- Made for greenhouse and indoor cultivation environments
- Food grade stainless steel construction for years of trouble free service
- 1 year warranty



Tower



Wall Mount



In-Duct Plus



UV



Light Commercial

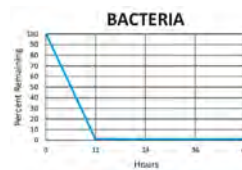
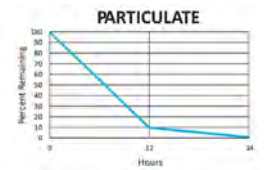
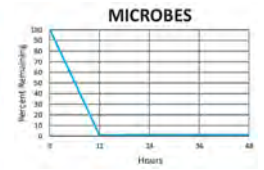
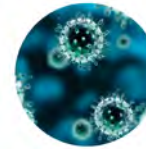
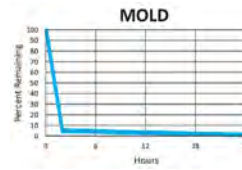




ELEMENT AIR TOWER

Available in free standing floor units or horizontal/vertical wall mount

Material: Stainless Steel
Depth: 18"
Width: 20"
Height: 78"
Weight: 70 lbs.
Electrical: 110V, 2.8 A



**REDUCES
99+%**

Element Air
Air Purification Systems

ELEMENT AIR UV

Dimensions: 5" probe, 5.5" plate
 9" probe, 5.5" plate
 14" probe, 5.5" plate

Weight: 4 lbs.

Electrical: 24VAC

In-duct unit (fixed mount)



ELEMENT AIR IN-DUCT

Dimensions:

5" probe, 5.5" diameter plate
 9" probe, 5.5" diameter plate
 14" probe, 5.5" diameter plate

Weight:

6 lbs.

Electrical:

24VAC

In-duct unit (fixed mount)



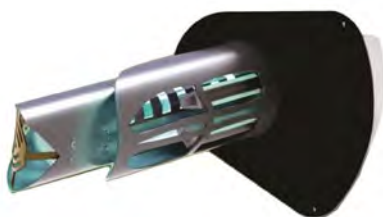
ELEMENT AIR IN-DUCT PLUS

Dimensions: 12" probe, 6.5" x 7.5" plate

Weight: 6 lbs.

Electrical: 24VAC

In-duct unit (fixed mount)



ELEMENT AIR LIGHT COMMERCIAL

Dimensions: 2.25" W x 10.5" L x 1.75" D

2.25" W x 13.5" L x 1.75" D

Weight: 1 lbs.

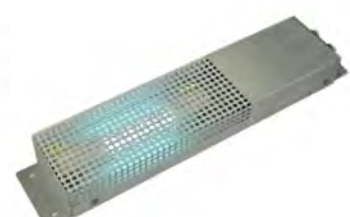
Electrical: 24VAC

Dimensions:

2.25" W x 18.5" L x 1.75" D

Weight: 2 lbs.

Electrical: 24VAC



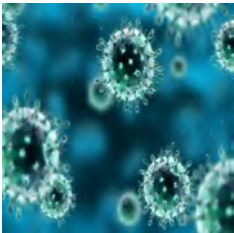


ADVANCED OXIDATION TEST RESULTS 2000-2016

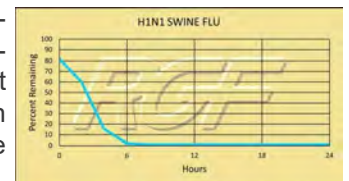
Element Air first developed its Advanced Oxidation Technology over 20 years ago. Over one million Element Air cells are in use around the world. Element Air has licensed its technology to many Fortune 500 companies for use in medical, food, military, residential, commercial, marine, hospitality and government applications. Element Air cells in various products have been tested and/or approved or registered by:

- ETL, TUV, EU, CSA
- U.S. Military
- Electric Power Research Institute
- Chinese Government
- Japanese Government (TV commercials)
- Canadian Government
- U.S. Government
- European Union
- USDA & FSIS

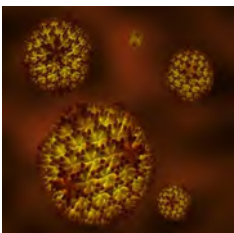
In addition, Element Air cells have been specified in the Norovirus & MRSA protection plans of America's largest restaurant chains, hotel chains, theme parks, cruise lines, public schools and hospitals. The following is a summary of some of the testing and studies performed by third party independent labs and universities. Element Air products are not medical devices and no medical claims are made.



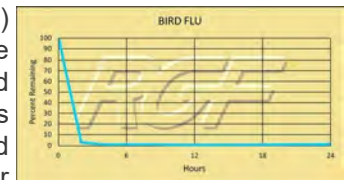
The **H1N1** flu virus, or swine flu, caused a worldwide pandemic in 2009-2010. It is now considered a seasonal flu, which continues to circulate seasonally worldwide. Spread of the H1N1 virus occurs in the same way that seasonal flu spreads. Flu viruses are spread mainly from person to person through coughing or sneezing by people with influenza. Sometimes people may become infected by touching items – such as a surface or object – with flu viruses on it and then touching their mouth or nose. Kansas State University completed preliminary testing on Element Air's Photohydroionization® (PHI-Cell®) and Reflective Electromagnetic Energy (REME® Cell) technologies with 99+% inactivation of H1N1 Swine Flu on a stainless steel surface.



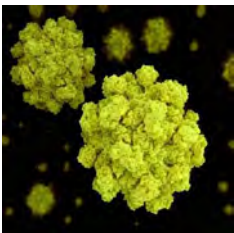
Tested by Kansas State University Inactivation Rate **99+%**



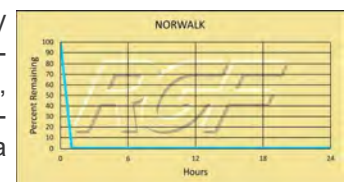
Avian influenza is an infection caused by avian (bird) influenza (flu) viruses. Avian influenza is very contagious among birds and can make some domestic birds, including chickens, ducks and turkeys, very sick and kill them. Of the few avian influenza viruses that have crossed the species barrier to infect humans, H5N1 has had the largest number of detected cases of severe disease and death in humans. Source: Centers for Disease Control and Prevention (CDC)



Tested by Kansas State University Inactivation Rate **99+%**



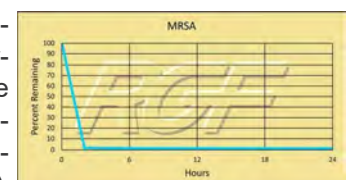
Norovirus is a highly contagious virus and as few as 10 viral particles may be sufficient to infect an individual. Infections of the virus can occur by consuming contaminated food or water, by touching contaminated surfaces, or from person-to-person transmission. Norovirus is named after the original strain "Norwalk virus," which caused an outbreak of gastroenteritis in a school in Norwalk, Ohio in 1968. The most common Norovirus outbreak settings include healthcare facilities, restaurants and catered events, on cruise ships and in schools. 50% of all food-borne outbreaks of gastroenteritis can be attributed to norovirus.



Tested by Midwest Research Institute Inactivation Rate **99+%**



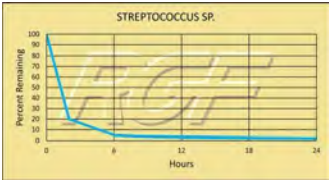
Methicillin-Resistant Staphylococcus Aureus (MRSA) is a type of bacterium responsible for difficult to treat infections due to its resistance to certain antibiotics. These antibiotics include methicillin and other more common antibiotics such as oxacillin, penicillin and amoxicillin. Staph infections, including MRSA, occur most frequently among persons in hospitals and healthcare facilities (such as nursing homes and dialysis centers) who have weakened immune systems. In the community, most MRSA infections are skin infections. In medical facilities, MRSA causes life-threatening bloodstream infections, pneumonia and surgical site infections. ELEMENT AIR along with a major hospital participated in a two-year study evaluating PHI technology, which resulted in a 33.4% reduction in infections.



Tested by Kansas State University Inactivation Rate **99+%**



Streptococcal (strep) infections are caused by group A streptococcus, a bacterium responsible for a variety of health problems. Most infections are relatively mild illnesses, such as “strep throat”. These bacteria spread through direct contact with mucus from the nose or throat of people who are sick with an infection, or through contact with infected wounds or sores on the skin. Source: U.S. Department of Health and Human Services



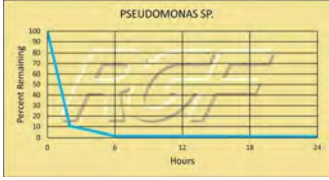
Tested by Kansas State University Inactivation Rate **96+%**



Pseudomonas Sp.

The bacterial genus *Pseudomonas* includes plant pathogenic bacteria such as *P. syringae*, the opportunistic human pathogen *P. aeruginosa*, the ubiquitous soil bacterium *P. putida*, and some species that are known to cause spoilage of unpasteurized milk and other dairy products.

Source: CDC: Center for Disease Control and Prevention

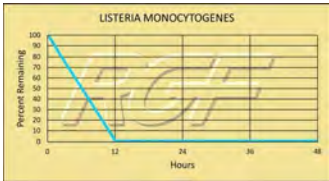


Tested by Kansas State University Inactivation Rate **99+%**



Listeria Monocytogenes

Listeria Monocytogenes is a bacterium that causes listeriosis. They are commonly found in soil and water. Most human infections follow consumption of contaminated food such as uncooked meats; unpasteurized milk and cheeses, and cooked or processed foods such as ready-to-eat meats. Unlike most bacteria, *Listeria* is able to grow at refrigerated temperatures. The disease primarily affects older adults, pregnant women, newborns, and adults with weakened immune systems. Source: CDC

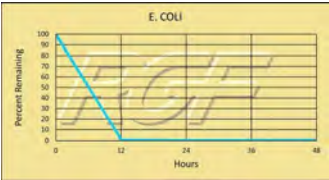


Tested by Kansas State University Inactivation Rate **99+%**



Escherichia coli

Escherichia coli, usually abbreviated *E. coli*, are a large and diverse group of bacteria, which are found in the lower intestines of mammals. Some strains such as enterohaemorrhagic *E. coli* (EHEC) that are pathogenic can cause severe foodborne illness. Outbreaks are most often linked to raw or undercooked meat products, raw milk, and fecal contamination of vegetables. Source: CDC: Center for Disease Control and Prevention

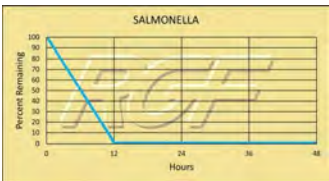


Tested by Kansas State University Inactivation Rate **99+%**



Salmonella

Salmonella is the name of a group of bacteria and is one of the most common causes of food poisoning in the United States. Every year one million people are infected, with more than 19,000 hospitalizations and 380 deaths. Source: Food Safety /CDC Center for Disease Control

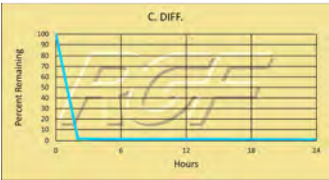


Tested by Kansas State University Inactivation Rate **99+%**



Clostridium difficile (C-Diff)

Clostridium difficile, also known as C-diff or *C. difficile*, is a gram-positive bacterium that can cause an inflammation known as colitis. It is considered a healthcare-associated infection (HAI). C-Diff infection rates have been on the rise and are becoming more severe and difficult to treat.



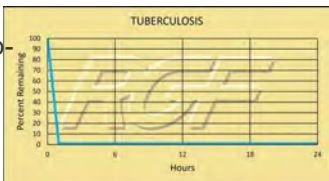
Tested by Kansas State University Inactivation Rate **99+%**



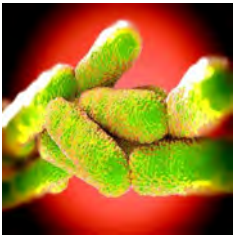
Tuberculosis

Tuberculosis is caused by the bacterium *Mycobacterium tuberculosis*. It typically attacks the lungs, but can also affect other parts of the body. It is spread through the air when people with infection cough, sneeze, or otherwise transmit their saliva through the air. Most infections are asymptomatic and latent, but about one in ten latent infections eventually progresses to active disease which, if left untreated, kills more than 50% of those so infected

Source: Centers for Disease Control

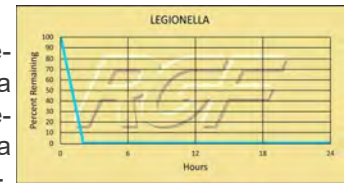


Tested by Kansas State University Inactivation Rate **99+%**



Legionella

Legionella is a group of pathogenic bacteria that is one of the most frequent causes of waterborne disease in humans. One type of pneumonia caused by Legionella is called legionellosis, or commonly known as Legionnaires' disease. The disease is transmitted when people breathe in a mist or vapor with the bacteria. Source: CDC Centers for Disease Control

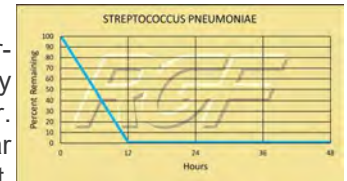


Tested on Pan Saver by Kansas State University Inactivation Rate **99+%**

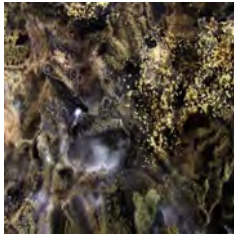


Streptococcus Pneumoniae

S. pneumonia is an exclusively human pathogen and is spread from person-to-person by respiratory droplets, meaning that transmission generally occurs during coughing or sneezing to others within 6 feet of the carrier. The bacteria can cause many types of illnesses, including meningitis, ear infections, sinus infections, and bacteremia. Health experts estimate that more than 10 million mild infections (throat and skin) like these occur every year. Source: CDC Centers for Disease Control



Tested by Kansas State University Inactivation Rate **99+%**

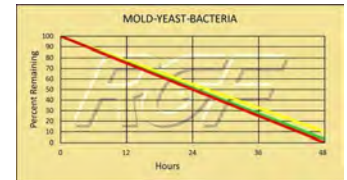


Bacteria/Mold/Yeast

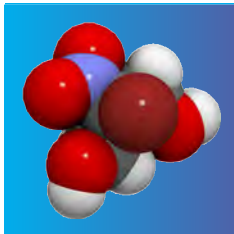
The purpose of these tests was to evaluate the effect Element Air's Advanced Oxidation Technology has on mold, yeast and bacteria (TPC). This test was performed utilizing a standard 2,000 sq. ft. home and 3,000 sq. ft. simulated home.

Reduction %

Bacteria 99% **Mold 97-98%** **Yeast 90+%**



Tested by California Microbiology Center



Chemical Compounds

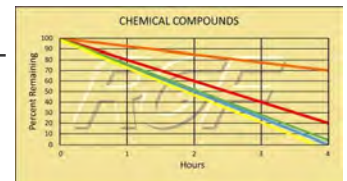
Gas Chromatograph/Mass Spectrometer test performed by Nelap Accredited Lab on airborne chemical compound reduction using Element Air's AOT.

Hydrogen Sulfide - Rotten eggs
Methyl mercaptan - Rotten cabbage
Carbon Disulfide - Vegetable sulfide

Butyl Acetate - Sweet banana
Methyl Methacrylate - Plastic

Reduction %

Hydrogen Sulfide 80% **Methyl mercaptan 100%** **Carbon Disulfide 30%** **Butyl Acetate 100%** **Methyl Methacrylate 100%**

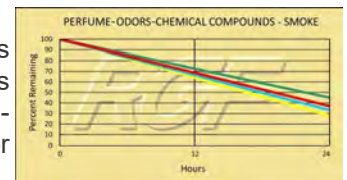


Tested by GC/MS Nelap Accredited Independent Lab



Odors

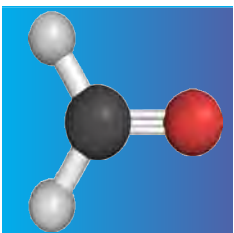
The purpose of this test was to evaluate to what effect the Element Air's AOT unit has on cleaning chemicals, pet odors, and perfume odors. This test was performed utilizing two 500 cubic foot test chambers and a ten-person odor panel. The qualitative assessments of the ten-person odor panel were then used as a means to determine the odor reduction.



Tested by C&W Engineering (Independent PE Firm)

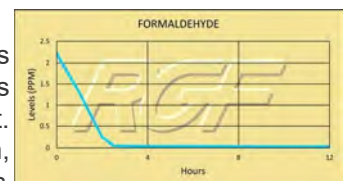
Reduction %

Cleaning chemicals 55+% **Pet odors 72%** **Perfume odors 63+%** **Smoke odors 70%**

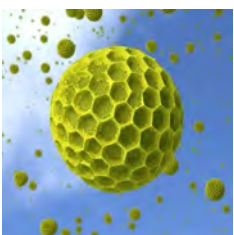


Formaldehyde

Formaldehyde is a colorless, flammable, strong-smelling chemical that is used in building materials and to produce many household products. It is commonly used as an industrial fungicide, germicide and disinfectant. When formaldehyde is present in the air at levels exceeding 0.1 ppm, some people may experience adverse effects including burning sensations in the eyes, nose, and throat, coughing, nausea, as well as skin irritation. The purpose of this test was to evaluate the effect Element Air's Advanced Oxidation Technology has on formaldehyde.

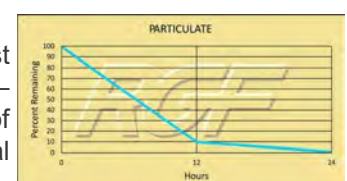


Tests by Kansas State University | Formaldehyde levels less than 0.05 ppm in 4 hours



Suspended Particulate Reduction-REME®

The REME® Cell was evaluated for particulate reduction in a particle test chamber. Particle counts were reduced to ISO Class 4 levels (10,000 – 0.1µm) within 12 hours of exposure to the REME® Cell. After 24 hours of treatment, ISO Class 3 levels (1,000 – 0.1µm) were achieved. Typical HEPA filtration is effective down to .3µm



Tested by Kansas State University Inactivation Rate **99+%**



Electrical / Ozone / EMF

All Element Air AOP devices have been thoroughly tested for electrical safety, ozone / EMF - Electro Magnetic Frequency and have passed Federal Safety Standards.

Tested by: TUV, ETL, UL, CSA, NEI China, Element Air Labs. The Japanese Government, GSA, and Electrical Power Research Institute.

Note: Many household appliances emit some ozone and EMF in safe low levels such as fluorescent lights, motors, computers, copy machines, refrigerators, blenders, electronic air filters, air conditioners, electric fans, microwave ovens, etc.

Sneeze Test - ELEMENT AIR PHI and REME®

A testing protocol concept was used which included a "Sneeze Simulation Machine" and "Sneeze" chamber. A sneeze can travel at up to 100 mph, so lung capacity, sneeze pressure, and liquid volume had to be taken into consideration to properly simulate a human sneeze. This was accomplished and the test proceeded with outstanding results. An average of 99% reduction of sneeze germs was achieved with PHI/ REME® in a double-blind test, at three feet from the sneeze source. Simulated Sneeze Lab Test at three feet in a 250 cu ft Bio Test Chamber. An independent PE double blind study.



Tested by: Kansas State University, inactivation 99%

SAFETY

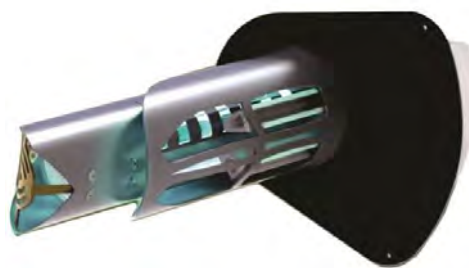
It is a normal reaction to question the long-term safety of any product that is effective and uses new or "breakthrough" technology. This type of question has become common as our litigious society has taught us to question things that significantly outperform existing methods or products.

The ELEMENT AIR *advanced oxidation technologies* that produced the results found on the pages of this report certainly fall into the category of breakthrough technology. This is evident by its outstanding test results across the entire range of microbes.

The breakthrough in the ELEMENT AIR *advanced oxidation technologies* is not found in the final product (hydroperoxides), but rather in the method by which they are produced. The active ingredient created by the ELEMENT AIR products is a group of oxidants known as Hydroperoxides. Hydroperoxides have been a common part of our environment for over 3.5 billion years. Hydroperoxides are created in our atmosphere when- ever three components are present: unstable oxygen molecules, water vapor and energy (electromagnetic).

Hydroperoxides are very effective (as demonstrated by the test results in this book) at destroying harmful microbials. As oxidants, they do this by either destroying the microbe through a process known as cell lysing or by changing its molecular structure and rendering it harmless (which is the case in VOC's and odors). The amount of hydroperoxides required to accomplish this task in a conditioned space is well below the level that is constantly in our outside air. The advanced oxidation technology found in ELEMENT AIR's Guardian Air product family has brought the oxidants found in the outside air into the conditioned space of your home, office, business, etc.

There is no known case of hydroperoxides ever creating a health risk. Considering we have been exposed to hydroperoxides in nature since the day man stepped on the planet, it is a reasonable assumption that hydroperoxides do not constitute a health risk. Over the past 20 plus years ELEMENT AIR has more than one million Advanced Oxidation products successfully used worldwide.



Disclaimer:

All the above tests were performed on ELEMENT AIR Advanced Oxidation products with Advanced Oxidation Plasma of less than .02 ppm unless noted otherwise. They were conducted by independent accredited labs and university studies. They were funded and conducted by ELEMENT AIR's major clients to assure third party credibility. ELEMENT AIR products are not medical devices and no medical claims are made.

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Element Air™

Air Purification Systems



“Protecting Your Grow”

Our patented Element Air treatment systems are the most practical and effective solutions for airborne and surface microbial contaminants, including powdery mildew, total yeast and mold (TYM) and Cannabis odors. Element Air has been independently verified to reduce bacterial and other microbial contaminants by 99+%.

The Element Air technology utilizes broad spectrum, high-intensity UV lights targeted on a hydrated quad-metallic catalyst which utilizes ambient moisture to generate hydro-peroxides and hydroxides that are propelled into the cultivation facility, to provide active microbial and odor mitigation.

As opposed to other units promoted to the Cannabis market, which utilize a similar technology, Photocatalytic Oxidation (PCO), which only sanitize the air that is passed directly in it's path, Element Air is an active purification system, purifying the ducts and general growing spaces, while also removing odor at the source.

urban-gro

Providing Product Solutions for the
Commercial Cannabis Cultivator

urban-gro.com

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720.390.3880



ELEMENT AIR TOWER

- REDUCES
- Mold
 - Microbes
 - Bacteria
 - Odors/VOCs

- APPLICATIONS
- Cultivation Rooms
 - Large Harvest Rooms
 - Green Houses
 - Processing Rooms

Item #	Replacement Cell	Electrical	Dimensions	Ship Wt.
EAT Gen 1	EAT-GEN1-0000-RC (2) EAT-GEN1-0100-RC (1) EAT-GEN1-7525-RC (1)	120 VAC 6 Amps	78" H x 18" D x 20" W	70 lbs.

*Available in free standing floor unit or horizontal/vertical wall mount



ELEMENT AIR RAPID RECOVERY

- REDUCES
- Mold
 - Microbes
 - Bacteria
 - Odors/VOCs

- APPLICATIONS
- Cultivation Rooms
 - Large Harvest Rooms
 - Green Houses
 - Processing Rooms

Item #	Replacement Cell	Electrical	Dimensions	Ship Wt.
EARR	EARR-RC (2)	120VAC / 1.25 Amp	26"L x 13"W x 15"H	12 lbs.

*Portable



ELEMENT AIR RAPID TZO3

- REDUCES
- Mold
 - Microbes
 - Bacteria
 - Odors/VOCs

- APPLICATIONS
- Cultivation Rooms
 - Large Harvest Rooms
 - Green Houses
 - Processing Rooms

Item #	Replacement Cell	Electrical	Dimensions	Ship Wt.
EATZO3	EARR-RC (2)	120VAC / 1.25 Amp	26"L x 13"W x 15"H	12 lbs.

Ozone

*Portable



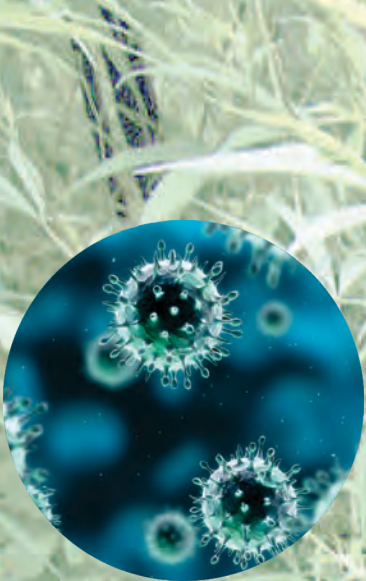
ELEMENT AIR WALL UNIT

- REDUCES
- Mold
 - Microbes
 - Bacteria
 - Odors/VOCs

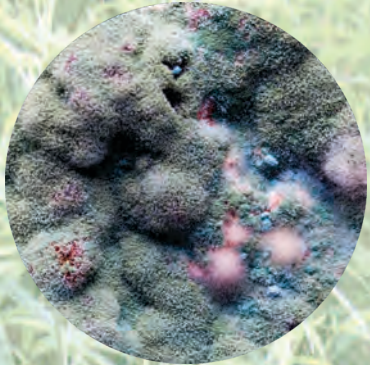
- APPLICATIONS
- Cultivation Rooms
 - Large Harvest Rooms
 - Green Houses
 - Processing Rooms

Item #	Replacement Cell	Electrical	Dimensions	Ship Wt.
EAWM-12	EAWM-12-RC (1)	100-277 VAC	4" H x 4" D x 14" W	2 lbs.
EAWM-XL	EAWM-XL-RC (1)		6" H x 6" D x 14" W	2 lbs.
EAWM-XLD	EAWM-XLD5-RC (1)		6" H x 6" D x 14" W	2 lbs.
	EAWM-XLD9-RC (1)		6" H x 6" D x 14" W	2 lbs.

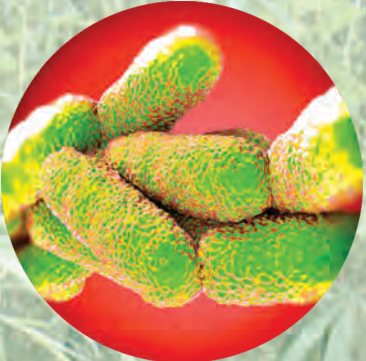
*Portable



Microbes



Mold



Bacteria

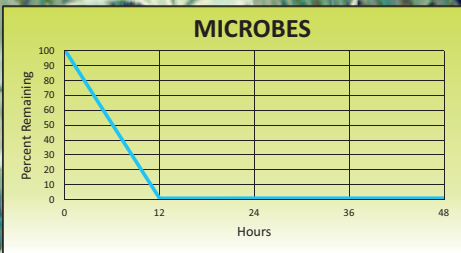
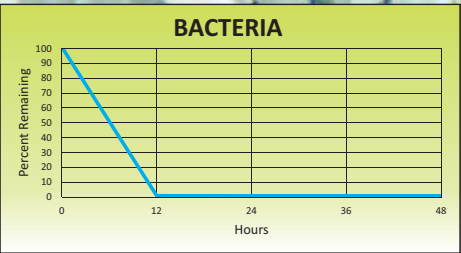
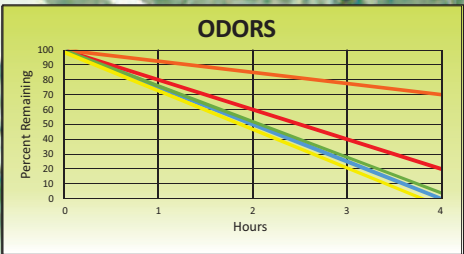
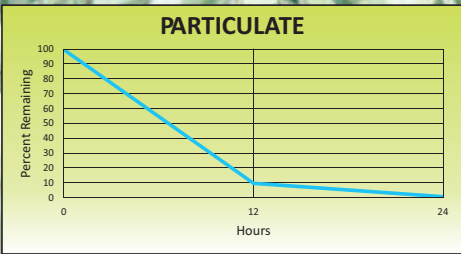
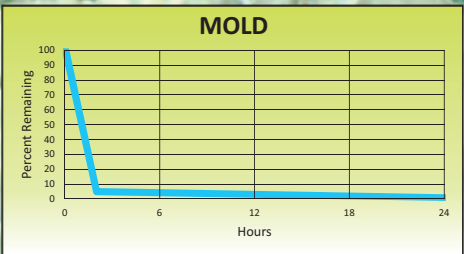
Reduces
99+%



Particulate



Odors



Element Air cells in various products have been tested and/or approved or registered by:

ETL, TUV, EU, CSA
U.S. Military
Electric Power Research Institute

Chinese Government
Japanese Government (TV commercials)
Canadian Government

U.S. Government
European Union
USDA

Tested by Kansas State University Inactivation Rate 99+%



ELEMENT AIR PLUG IN PLUS

- REDUCES
- Mold
 - Microbes
 - Bacteria
 - Odors/VOCs

- APPLICATIONS
- Small Trim Rooms
 - Small Dry Rooms
 - Small Processing Rooms

Item #	Replacement Cell	Electrical	Dimensions	Ship Wt.
EAPIP	EAPIP-RC (1)	120VAC / 50 watts	6.25" w x 3.75" d x 10" h	2 lbs.

*Portable



ELEMENT AIR DESKTOP UNIT

- REDUCES
- Mold
 - Microbes
 - Bacteria
 - Odors/VOCs

- APPLICATIONS
- Offices
 - Dispencary

Item #	Replacement Cell	Electrical	Dimensions	Ship Wt.
EADT	EADT-RC (1)	120VAC / 11 watts	6" w x 3" d x 12" h	2 lbs.

*Portable



ELEMENT AIR ON THE GO

- REDUCES
- Mold
 - Microbes
 - Bacteria
 - Odors/VOCs

- APPLICATIONS
- Great at reducing VOCs in
- Vehicles
 - Small Offices

Item #	Replacement Cell	Electrical	Dimensions	Ship Wt.
EAOTG	EAOTG-RC (1)	12 VDC	3"W x 3"D x 9"T	1 lbs.

*Mobile unit



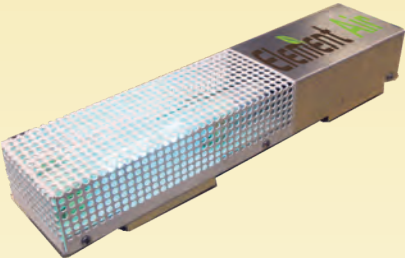
ELEMENT AIR COMMERCIAL

- REDUCES
- Mold
 - Microbes
 - Bacteria
 - Odors/VOCs

- APPLICATIONS
- Cultivation Rooms
 - Large Harvest Rooms
 - Green Houses
 - Processing Rooms

Item #	Replacement Cell	Electrical	Dimensions	Ship Wt.
EACU	EACU-14-RC EACU-0000-RC EACU-0100-RC EACU-7525-RC	120-277 VAC *Refer to product label for cell sizes and quantity	NA	50 lbs.

*In-duct unit (fixed mount)



ELEMENT AIR LIGHT COMMERCIAL

- REDUCES
- Mold
 - Microbes
 - Bacteria
 - Odors/VOCs

- APPLICATIONS
- Cultivation Rooms
 - Large Harvest Rooms
 - Green Houses
 - Processing Rooms

Item #	Replacement Cell	Electrical	Dimensions	Ship Wt.
EALC-5	EALC-5-RC (1)	24 VAC	2.25"W x 10.5"L x 1.75"D	1 lbs.
EALC-9	EALC-9-RC (1)		2.25"W x 13.5"L x 1.75"D	1 lbs.
EALC-14	EALC-14-RC (1)		2.25"W x 18.5"L x 1.75"D	2 lbs.

*Magnetic (fixed mount)



ELEMENT AIR ATS HO

- REDUCES
- Mold
 - Microbes
 - Bacteria
 - Odors/VOCs

- APPLICATIONS
- Cultivation Rooms
 - Large Harvest Rooms
 - Green Houses
 - Processing Rooms

Item #	Replacement Cell	Electrical	Dimensions	Ship Wt.
EA-ATSHO	EAATS-0000-RC (2) EAATS-0100-RC (1) EAATS-7525-RC (1)	24 VAC	18" H x 14.5" D x 52" L	65 lbs.

*Wall mount (fixed mount)





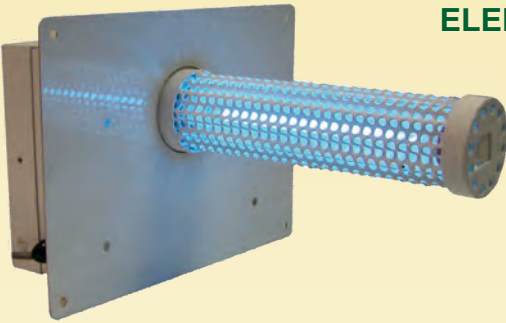
ELEMENT AIR IN DUCT PLUS

- REDUCES
- Mold
 - Microbes
 - Bacteria
 - Odors/VOCs
 - Particulate

- APPLICATIONS
- Cultivation Rooms
 - Large Harvest Rooms
 - Green Houses
 - Processing Rooms

Item #	Replacement Cell	Electrical	Dimensions	Ship Wt.
EAIDPLUS	EAIDPLUS-RC (1)	24 VAC	12" probe / 6.5" x 7.5" plate	6 lbs.

*In-duct unit (fixed mount)



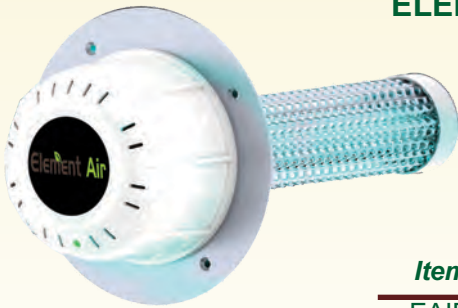
ELEMENT AIR IN DUCT HO

- REDUCES
- Mold
 - Microbes
 - Bacteria
 - Odors/VOCs

- APPLICATIONS
- Cultivation Rooms
 - Large Harvest Rooms
 - Green Houses
 - Processing Rooms

Item #	Replacement Cell	Electrical	Dimensions	Ship Wt.
EAIDPLUS	EAIDHO-14C-RC (1)	24 VAC	12" probe / 6.5" x 7.5" plate	6 lbs.

*In-duct unit (fixed mount)



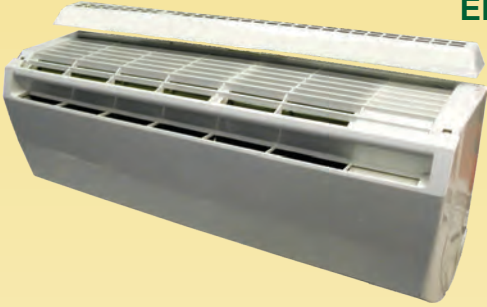
ELEMENT AIR IN DUCT

- REDUCES
- Mold
 - Microbes
 - Bacteria
 - Odors/VOCs

- APPLICATIONS
- Cultivation Rooms
 - Large Harvest Rooms
 - Green Houses
 - Processing Rooms

Item #	Replacement Cell	Electrical	Dimensions	Ship Wt.
EAID-5	EAID-5-RC (1)	24 VAC	5" probe / 5.5 Dia." plate	4 lbs.
EAID-9	EAID-9-RC (1)		9" probe / 5.5 Dia." plate	4 lbs.
EAID-14	EAID-14-RC (1)		14" probe / 5.5 Dia." plate	4 lbs.

*In-duct unit (fixed mount)



ELEMENT AIR MINI SPLIT

- REDUCES
- Mold
 - Microbes
 - Bacteria
 - Odors/VOCs

- APPLICATIONS
- Offices
 - Dry / Cure Rooms

Item	Replacement Cell	Electrical	Dimensions	Ship Wt.
EAMS-230	EAMS-RC (1)	230VAC	30"W x 2.5"D x 1.25"H	3 lbs.
EAMS-110	"	110VAC		

*Fixed mount



ELEMENT AIR UV

- REDUCES
- Mold
 - Microbes
 - Bacteria
 - Odors/VOCs

- APPLICATIONS
- Great at reducing bacteria mold and microbes living directly on your HVAC coil

Item #	Replacement Cell	Electrical	Dimensions	Ship Wt.
EAUV-1 (1 year lamp)	EAUV-1-RB	24 VAC	3"W x 18"L x 3"D	1 lbs.
EAUV-2 (2 year lamp)	EAUV-2-RB			

*Magnetic (fixed mount)



ELEMENT AIR IN DUCT and MINI SPLIT IONIZERS

- REDUCES
- Particulate

- APPLICATIONS
- Great add on for reducing particulate on any application

Item #	Electrical	Dimensions	Ship Wt.
EAI-DM	24 VAC	7"L x 2.5"D x 3.5"H	1 lbs.
EAI-MS	100-277 VAC	7"L x 2.5"D x 1.5"H	

*Magnetic / fixed mount