



Ductzone

Ozone generator
Maintenance Manual



SPECIFICATIONS FOR DUCTZONE

Specifications

Maximum Ozone output	300 mg/hr fully variable
Filter	No
Cabinet construction	stainless steel
Adjustable output	Fully variable
Power usage	12 Volt 1 amp max 115 Volt wall adapter
Size	4.75 H X 5.5 W X 7.25 D
Number of tubes	2
Warranty	2 Year

Ductzone Ozone generator Owners Manual

CAUTION: READ INSTRUCTIONS THOROUGHLY BEFORE OPERATING UNIT

(This ozone generator operates at 4000 volts)

HOW OZONE WORKS:

Crystalair ozone generators use ozone to deodorize the air the same way nature uses lightning to create ozone to clean the air naturally. Ozone is very unstable and attaches to pollutants, odors, etc. and oxidizes them. This reaction of ozone leaves an area with fresh clean smelling air.

CAUTION: DO NOT PLUG UNIT IN WITH LID OFF

1. Read complete instructions before using ozone generator
2. Open cabinet by following step 1 of the cleaning instructions. Check to make sure the corona tube has not moved out of place. Once this has been checked the Ductzone may be installed.

INSTALLATION AND SETTING OF MACHINE:

1. **(Installation)** The Ductzone ozone generator has been designed for use in air handling systems. The Ductzone should be mounted in the return air duct of the air handling system, preferably as far away from the filter and fan as possible. This will allow the ozone to mix with the air flowing through the duct quicker.

A. Once you have found a convenient place to mount the Ductzone cut the center out of the template and position the template on the duct (a small piece of tape may be used to hold the template in place). Note the air flow direction markings. Using a marker, trace the hole in the template onto the duct.

B. Remove the template and cut the square hole in the duct using a Jig Saw, being careful to make a clean neat cut.

C. Place the Ductzone into the hole in the duct and mark the four holes for the screws with a marker. Remove the Ductzone and drill the four holes with a 7/64 drill bit. Place the Ductzone back into the hole and install the four screws, **be very careful not to strip the holes.**

D. You will need to either have an electrician wire in an AC power receptacle to the air handling system fan or set the air handling fan to run full time (24 hrs per day).

E. Plug the wall transformer into the Ductzone and then plug the wall transformer into the AC power receptacle.

2. **(Setting Ozone Level in occupied areas)** The right level is when all the generated ozone is being used up accomplishing its job. However, this is difficult to obtain because it becomes a balancing act. Initially the machines output is set high for a short time to get rid of the problem odor as quickly as possible. As this is being accomplished less ozone is required for the diminishing odors, thereby leaving some residual ozone in the air. If the machines output is not turned down after awhile then more residual ozone will be in the air. If there is a heavy smell of ozone, there is more ozone present than is required to do the job. Simply turn the rheostat down. This is a case where more is not considered better. The levels of ozone required to clean most environments are from .03 ppm to .08 ppm.

- The Ductzone can be turned down by simply turning the rheostat control knob.

CAUTION: Do not substitute the stainless steel mesh generator screens with any screen other than the one supplied with your unit.

MAINTENANCE:

Under heavy duty use or severely polluted areas, your CRYSTALAIR ozone generator should be inspected every 2 to 8 weeks for fine dust or oily residue collecting on generator surfaces or plates. Light duty use requires cleaning every 4 weeks to 6 months depending on severity of pollution and humidity.

NOTE#

If a fine dust or oily residue appears, it is time to follow the recommended cleaning procedures.

DUCTZONE CLEANING INSTRUCTIONS

(WARNING: HIGH VOLTAGE)

Ensure that power supply is disconnected before starting any maintenance procedure or electrical shock injury may result.

CLEANING PROCEDURE:

1. Remove the Ductzone from the air handling system by removing the four corner screws that are closest to the outer edge of the mounting plate.

2. Locate and remove the phillips screws that hold the generator guard in place, next carefully remove corona tubes by pushing them to one end and lifting them up. (Similar to removing some flourescent lights) (FIG. 1 & 2)

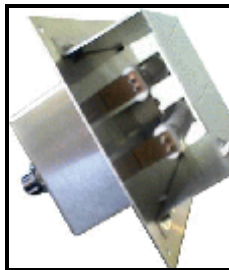


Figure 1

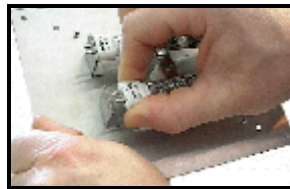


Figure 2

3. Carefully pull the stainless steel screen off the corona tube. **BE VERY CAREFUL NOT TO BEND THE STAINLESS STEEL SCREEN**

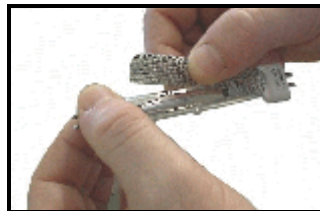


Figure 3

4. Using soap, water and an old tooth brush, clean the corona tube and the stainless steel screen. **BE VERY CAREFUL NOT TO BEND THE STAINLESS STEEL SCREEN** Rinse and dry 100% by towel drying and then allowing the tube to sit in a warm area like on top of the fridge for about 12 hours.

(WARNING: All components must be 100% dry before use or damage to generator will result)

REPLACING SERVICED CORONA TUBE IN MACHINE:

5. Once the corona tube and stainless steel have been cleaned and dried 100% you may reinstall the stainless steel screen onto the corona tube.

6. Reinstall the corona tube assembly into the holding brackets.

7. Reinstall the generator guard and reinstall the Ductzone into the air handling system and operate as normal.

TROUBLE SHOOTING:

1. No ozone:

A: Clean corona tubes.

B: Test wall transformer.

C: Try switching unit on and off a few times, the switch may have some dirt in it.

2. Unit snaps or sparks:

A: Are the tubes clean ? (refer to maintenance)

b: If unit makes a snapping or popping sound, moisture may be present in corona tube (allow to dry for a few hours). Ensure upon reinstallation that stainless steel is centered as close as possible and that all other components of ozone generator are clean dry and damage free.

CAUTION:(Be very careful not to scratch corona tubes). If snapping or sparking still occurs or the unit does not produce ozone then unit will have to be sent in for service.

WARRANTY

The Ductzone is warranted against defects in materials and workmanship for a period of four years from date of purchase. Liability is limited to parts and labor only. Shipping is the sole responsibility the customer. CRYSTALAIR is not liable for damage caused by shipping, misuse, neglect or lack of regular maintenance.

Questions and Answers About Ozone

QUESTION: WHAT IS OZONE?

ANSWER: Ozone is sometimes called "activated oxygen". It contains three atoms of oxygen rather than the two atoms we normally breathe. Ozone is the second most powerful sterilant in the world and its function is to destroy contaminants and odors. Interestingly ozone occurs quite readily in nature, most often as a result of lightning strikes that occur during thunderstorms. In fact that "fresh, clean, spring rain" smell that we notice after a storm most often results from nature's creation of ozone. Ozone is also created by water falls. However, we are probably most familiar with ozone from reading about the "ozone layer" that circles the planet above the earth atmosphere. Here ozone is created by the sun's ultra-violet rays. This serves to protect us from the ultra-violet radiation. Additionally, each of us is exposed to high levels of ozone daily for short periods of time. This happens in heavy traffic conditions or during times when the weather forces the industrial gases to remain lower to the ground than is otherwise normal. The combination of these two factors can result in ozone readings as high as 4 or 5 times the "regulatory" levels for continuous exposure with absolutely no adverse effects as our exposure is for such short periods, and the ozone itself decays back to normal oxygen so rapidly.

QUESTION: HOW DOES OZONE WORK?

ANSWER: While ozone is very powerful, it has a very short life cycle. When it is faced with odors, contamination, etc. the extra atom of oxygen destroys them completely by oxidation. In so doing, that extra atom of oxygen is destroyed and there is nothing left...no odor...no contamination...no extra atom, only oxygen. In addition to the effectiveness of ozone, we also know that it is safe to use. We know this from our own safe exposures daily to ozone, weather, as noted earlier, resulting from being locked in traffic, or passing through industrial areas. These exposures have no effect on us beyond our acknowledging the unpleasant odor associated with this "filthy air". It is the very unpleasantness of this air that provides ozone with its "built in" safety mechanism. Ozone is safe because we notice its unpleasant odor at very residual levels. By residual we mean, the amount of ozone that is produced in excess of the required amount to kill whatever contamination or odor that may be present in the room. This equipment, when installed correctly will not exceed government guidelines for continuous safe exposure. Even if installed incorrectly, ozone provides its own protection, as ozone warns us in a manner similar to smoke in a room. Ozone does this by becoming so offensive at 1.5 parts per million that we would not be able to stay in the environment for any more than a short period. This is much like what would happen if we entered a smoke filled room. However, while smoke might harm us, research has proven that such a limited exposure to such a low level of ozone would have no serious long term effect on us just as it does not affect us when caught in a traffic jam during rush hour.

QUESTION: HOW IS OZONE PRODUCED?

ANSWER: There are basically two methods of producing ozone...ultra-violet and corona discharge. Most equipment uses the corona discharge method, simulating in essence, lightning. Corona discharge ozone generators are fully adjustable. Equipment utilizing UV is not very popular because it is inefficient, unreliable, unadjustable, and very costly to service compared to the modern corona discharge equipment now available.

QUESTION: HOW LONG DOES THE OZONE LAST?

ANSWER: As soon as ozone is formed in the generator and dispersed in a room some of it decays back into oxygen. This step occurs by several processes including the following: Natural decay (or reversion to oxygen) due to ozone chemical instability. Speeding up of the above process by the presence of such as walls, carpets etc. stimulating the decay process. Oxidation reaction with odor causing organic material, which removes ozone. Reactions with contamination etc., which again consumes ozone by oxidation reactions. Additionally ozone itself has a half life which means that "residual" ozone created (extra unneeded ozone) will return to oxygen within at most 30 minutes, in amounts equal to half its level. What this means is that after each subsequent 30 minute period there would be half as much residual ozone left at the end of the period as was present at the beginning of the period. This is similar to a geometric progression of 16;8;4;2;1. In practice the half life is usually less than 30 minutes due to contaminants in the air. Therefore, ozone while very powerful doesn't last long...just does its job and disappears.

QUESTION: WILL THE ODOR COME BACK?

ANSWER: No. Ozone destroys the source of odor. However, in the case of mildew the odor will return if you are unable to get rid of the moisture that is the source of the mildew.

QUESTION: HOW DOES OZONE HANDLE TOBACCO SMOKE?

ANSWER: It reduces the irritation caused by phenol gasses, by oxidizing them. Phenol gasses are the invisible part of tobacco smoke that causes such discomfort to one's eyes and create the offensive odors. Ozone rids any environment of the effects of smoke completely, rather than merely filtering out some of the visible particles like an "electronic air cleaner".

QUESTION: WHAT IS THE RIGHT LEVEL OF OZONE?

ANSWER: The right level is when all the generated ozone is being used up accomplishing its job. However, this is difficult to obtain because it becomes a balancing act. Initially the machine's output is set high to get rid of the problem odor as quickly as possible. As this is being accomplished less ozone is required for the diminishing odor etc., thereby leaving some residual ozone in the air. If the machine output is not turned down after awhile then more residual ozone will be in the air. If there is a heavy smell of ozone, then there is more ozone present than is required to do the job. Simply turn the rheostat (output level control) down. This is a case where more is not considered better. Sales successes result when the dealer ensures that the results are what the customer expects. The most successful dealers usually install equipment on a trial basis and return to the trial location 24 hours later to ensure that residual ozone levels are not too high and that the customer knows how and when to regulate the machine to avoid a strong ozone smell.

QUESTION: IS OZONE HARMFUL AND WHAT IF ANY ARE THE LONG TERM EFFECTS?

ANSWER: Ozone has been known for almost a century now, so quite a lot is known about it. Several regulatory agencies, including OSHA - Occupational safety and health agency in USA, and WCBC Occupational safety and health agency in Canada, have stipulated that the maximum safe allowable level of residual ozone is 0.08 ppm based upon the historical safety of ozone. Note that this permissible level is for continuous exposure throughout an entire 8 hour day for 5 days a week. If anyone is exposed to that concentration of ozone, it is usually as the by product of an industrial process like arc-welding. The temporary effects of such a low exposure would range from headaches, to sore throats, irritation in the eyes, nose and the like, similar again to what we would experience in a traffic jam.

QUESTION: HOW CAN YOU TELL THE LEVEL OF OZONE?

ANSWER: There are a number of mechanical methods available, the most common and effective being the Draeger tube, but the simplest, least expensive and very reliable method is using the Eco (ozone monitoring) Badge. Residual ozone becomes apparent to sensitive humans in the range of .01 - .03 ppm. or well below the permissible levels for continuous exposure. As noted previously, this residual ozone is extra ozone that is not required to reduce contamination etc. Adjustment of the rheostat is all that is required to reduce excess ozone.

QUESTION: WHAT ARE THE APPLICABLE REGULATIONS REGARDING OZONE?

ANSWER: In Canada the Worker's Compensation Board of B.C. guidelines stipulate that continuous exposure 8 hours a day for 5 days per week in an environment containing maximum level of 0.08 ppm. of ozone is safe. The normal concentrations that we will be using will be in the range of .01 - .03 ppm. well within the guidelines.

QUESTION: CAN OZONE BE HELPFUL for CRYOVAC'D BEEF?

ANSWER: Yes. If the premises where meat is hung, cut and eventually cryovac'd, are treated with ozone, then this meat will be virtually contamination free as it is being packaged in the cryovac. And will consequently retain its good looks and stay fresh much longer before being sold or used than meat packed in an ozone free room where both odors and contamination count will be high. Treatment of coolers and cutting packaging rooms with ozone ensures not only a germ reduced environment, but also a clean smelling room that customers and employees alike associate with a caring and progressive management.

IMPORTANT NOTE ON OZONE

It is not necessary that you even smell the sweet smell of ozone (compared to fresh country air following a thunderstorm) for it to be effective. Even roses are an objectionable odor to some people, when in excess.

- 1. TO SET OZONE:** Set ozone to a setting where you can barely detect ozone after an hour of operation.
- 2.** If ozone is still detected, reduce ozone setting, if the disagreeable odor is still prevalent, increase ozone setting. Properly adjusted, neither ozone or the objectionable odor should be detected.
- 3.** Levels of ozone required to deodorize most environments are from 0.03 ppm to 0.1 ppm.
- 4. CIRCULATION:** Air circulation is an important factor in how effective ozone works. An oscillating fan should be placed next to generator for proper circulation.
- 5. MOUNTING:** Generator should be mounted high in the room, 6 to 8 feet off the floor. Generator should be mounted above the door pointing away from sensitive areas.
- 6. P.S.** Ozone level should be reduced prior to entering an enclosed area such as a cooler.

A BASIC GUIDE TO DEODORIZATION USING OZONE

OZONE SHOCK TREATMENT PROCEDURE :

Suggested size: PRO-10,000 , PRO-5000 , PRO-3600-5

The idea of an ozone shock treatment procedure is to eliminate the initial contamination from the air and then provide continuous control over recurring contamination by way of ozone. First we must assess the caliber of the odor problem in order to determine the size of the Crystalair ozone generator which would be required to sufficiently eliminate the problem odor in a short period of time. Once we have chosen the ideal size of ozone generator for the particular treatment area, the ozone generator should be placed pointing in the direction of the problem area. Strong fans must be placed throughout the area being treated to provide good ozone distribution. Operate the ozone generator at it's highest capacity for as long as it takes to eliminate the odor problem. In most cases it takes only a few minutes to do a shock treatment. If it is a type of odor that is absorbed in furniture, walls and bedding, for example, cigarette smoke, takes only 30 minutes with the proper sized ozone generator. After the shock treatment procedure is complete, air out room and place a Crystalair ozone generator permanently along with an ozone monitor controller if odor problem is expected to be perpetual and constant. Severe cases may require a 24 hour treatment. Milder cases may need a smaller unit or use lower output setting.

NOTE# while performing a shock treatment, make sure that all people, pets, plants and other animals are vacant from the area to be treated. Also while using HIGH concentrations in a room, be sure that ozone does not leak into connected or occupied rooms by way of furnace vents or wall cracks etc..

GARBAGE ROOMS:

Suggested Size: PRO Series 3600-1, 3600-5, Depending on the size of garbage room

Place the Crystalair ozone generator on a shelf above the door entrance positioned so the air stream blows away from the sensitive entrance area. An additional osculating fan will greatly enhance the deodorization results by mixing all the contaminated air efficiently with the generated ozone. A shock treatment procedure may be required as the first step to treatment in a garbage room. (Refer to OZONE SHOCK TREATMENT PROCEDURE above), depending on the severity of odors prior to placement of Crystalair ozone generator. Humid rooms may need dry air routed to the ozone generator with a four inch vent hose.

COMPACTOR BINS:

Suggested Size: PRO 3600-1, 3600-5, 5000 Depending on severity of odor.

Crystalair PRO series ozone generator have a hose adapter for routing a four inch hose from ozone generator outlet to garbage compactor. Attach hose to a convenient location on compactor chute wall surface and boost the inlet hose of the Crystalair ozone generator with a 265 cfm. fan to ensure the air in the compactor does not back through ozone generator. The ozone generator must be mounted in a place convenient to rout fresh air to it and be safe from exposure to water and rough treatment.

GROCERY STORE STORAGE AREAS:

Suggested Size: PRO 3600-1, 3600-5 or PRO-5000 Depending on the size of the storage area
To reduce odors and reduce cross contamination of foods to other foods, install a Crystalair ozone generator in an out of the way place, with an additional fan to circulate the ozone efficiently throughout the entire area to be treated. Next install an ozone generator monitor controller in the center of the treated area to ensure the levels of ozone do not exceed the limits set by the Workers Compensation Board Of BC which are .1 ppm. averaged over an eight hour work period. The controller will cycle on and off as needed to maintain control of ozone at the proper levels.

HOTEL ROOMS:

Suggested Size: PRO-3600 1, PRO 3400-1, CA 55-1, or CA 45-2

These rooms can be generally deodorized in 30 to 40 minutes from cigarette or alcohol etc., by using a PRO-3600 1 or 2 and a 20" oscillating fan.

Housekeeper should also wet/dry vacuum the contaminated areas, (ex. vomit, spilled milk, spilled beer). with a good detergent solution before deodorization procedure is performed.

ANIMAL URINE:

Suggested Size: PRO-3600-1, PRO-3600-5 Depending on the size of room to be treated.

Customer must locate and identify the area of the urine contamination if possible. Treat all contaminated surfaces with a liquid deodorizer. *(All liquid contaminants must first be treated with a liquid deodorizer)*. Customer may have to pull up carpet, if present, in order to treat both sides if possible. Also treat the porous concrete or wood beneath the carpet. Allow liquid deodorizer to dry, then place Crystalair ozone generator in the room with an additional fan to eliminate the gaseous odor absorbed by the carpet, walls, wood and fabric furniture, mattresses etc.. Treat up to 48 hours depending on the severity of odors.

DECOMPOSED PROTEIN: *Dependent on the size of room and contamination level.*

Protein contamination is the result of food products such as milk, fish, meat, eggs etc. Other sources are from human or animal bodily discharge (like blood, urine, feces etc), decomposed meat, decomposed animal within a crawl space, death scene (decomposed body). In all cases of decomposed protein, the source of the odor must be removed as the first step to deodorization. (It is suggested that gloves and a respirator be worn to reduce the exposure to fleas and deadly contamination). Next treat the contaminated surfaces of the floor or any other items the protein was contacting with a liquid sanitizing solution to kill the contamination. Then a good liquid deodorizer like C20 or equivalent should be applied to all contaminated surfaces. Once the liquid sanitizing and deodorizing has been applied and dried, the Crystalair ozone generator may be placed in the treated area at a setting of medium to high to eliminate the gaseous odor absorbed by the walls and furniture etc. Use a strong fan to help force ozone in to the pores of walls and furniture fabric. **Note # Ozone may be set on a low setting before the technician does anything to deodorize the air in order to make the environment more comfortable to work in.**

SMOKING LOUNGES:

Suggested Size: PRO-360, CA-15, CA-55-2, CA-45-2, PRO-3600-1. Dependent on the size of room and contamination level.

Crystalair ozone generator should be properly sized for the specific area and number of possible smokers. Place the ozone generator close to the ceiling and away from roof exhaust vents. Complement the ozone generator with an oscillating fan to circulate and mix the ozone and contaminated air together to speed up the deodorization process. Adjust Crystalair ozone generator so that there is just a fresh smell in the air. Begin with the ozone generator on low setting and work your way up slowly. One person at the establishment should be in charge of adjusting the ozone generator output as the number of smokers increase or decrease. If ozone is set for 40 smokers and 30 vacate, then the ozone generator should be adjusted to lower setting, otherwise the air will become excessively ozonated and possibly cause sore throat or headache. An ozone monitor controller may be installed to eliminate the need to constantly adjust the ozone output.

OFFICES AND STORE FRONTS:

Suggested Size: PRO-360, CA-15, CA-55-1, 3400-1 Dependent on the size of room and contamination level.

The same procedures are used here as in the smoking lounges with one exception, That usually there is no smoking in offices and store fronts, therefore a smaller ozone generator may be required.

SMOKE DAMAGE CAUSED BY FIRE :

Suggested Size: PRO-10000, PRO-5000 Dependent on the size of room and contamination level.

In cases of small fire and smoke damage (e.g.: Grease Fire on stove, Severe toaster fire, fire place back through, mattress fire, electrical fire etc). With smoke fumes the premises should be thoroughly cleaned including the forced air furnace system before deodorization begins. Place a Crystalair ozone generator on each level of the building accompanied with a good blower fan to force the ozone through the small pores of the walls, carpet, and furniture. This process may take up to 24 hours for adequate results to be achieved. Furniture and mattresses may need additional treatment by draping a sheet of plastic over them and placing an ozone generator underneath for approx. 1-2 hours.

MOLD AND MILDEW:

Suggested Size: PRO-10000, PRO-5000, PRO-360 CA-15 or CA-55-1

Crystalair ozone generators reduce or eliminate the ability for the exposed mold, mildew and fungus to grow. Mold and mildew grow in dark and humid places where there is a lack of oxygen. In all cases the moisture and humidity in the walls, floor etc., must be removed to effectively eliminate the problem. Once moisture is removed, all visible mold and mildew must be removed, then a shock treatment procedure can be preformed lasting for 2-6 hrs. A small ozone generator can be used to help control continuous mildew problem odors.

AUTOMOBILES TRUCKS BOATS & RVs:

Suggested Size: PRO 360, PRO 36R, PRO 3400-1, PRO-3600-1, PRO-3600-5

Cigarette smoke and most other organic vapors can be removed from a car, truck, boat, motor home etc in 30-45 minutes. Place Crystalair ozone generator in automobile, roll windows down ½ inch, and adjust vent fan on full. Operate ozone at half to full for 30-45 minutes. Air out auto and smell for lingering odors. Repeat the procedure if necessary.

CAUTION;

Some auto odors are a result of chemical fragrance deodorizers that are non ozone depleting and therefore are very difficult to eliminate. Animal dander and oils embedded under the carpet, and sometimes must be lifted and cleaned with C20 or equivalent liquid deodorizer before treatment with ozone.

MUSTY BOOKS: *Suggested Size: PRO-3600-1, PRO-3600-5*

Books must be placed in a room and be opened as wide as possible. Arrange Crystalair ozone generator and fan to blow over the books. This process should take no more than one hour. Repeat if necessary.

FURNITURE AND CLOTHING ARTICLES: PRO 3600-1, PRO 3600-5, PRO-5000.

Make or utilize a room of proper size to accommodate all the articles to be deodorized. Place circulating fans in the room to vigorously blow the ozone around the room to penetrate the porous materials. Rout a four inch vent hose from the ozone output to a four inch cut out in the wall of the deodorization room. This procedure may go on for 1-12 hrs depending on the circumstances.

All procedures are basic. For more intense and extensive procedures, consult Crystalair or refer to fire and flood manual for comprehensive procedures

RULES OF THUMB:

a. Odors created in a hot environment are embedded deeper in the pores of the materials such as curtains, furniture, wallboard etc. This is due to pores expanding when hot and closing when cold. A warm environment will always produce better results than a cold one when deodorizing a gaseous odor.

b. Humidity always produces or enhances an odor. Existing odors are amplified to the human nose and odor causing contaminants like bacteria and fungus flourish in warm and humid environment.

c. Overkill and persistence is the successful way to deodorizing.

d. An additional fan of high output is necessary to in all ozone treatments for optimum results. The fan will force the ozone into the small pores of the material to remove the odors absorbed.

e. In all decomposed protein, use a powerful sanitizer or bactericide and a powerful liquid deodorizer like Epolean N-100, N-7C or equivalent.

f. Always use respirator and gloves when handling contaminated materials like rotten meats or dead animals.

g. Caution in areas of treatment using high levels of ozone. Treat all exposed natural rubber with a silicone spray or Vaseline in order to prevent cracking. This is not the case with fabric covered rubber cushions

h. Humid air supplied to the ozone generator will result in less ozone production. Dry air supplied to a generator will result in optimum ozone production.

Caution:

. The water in moist or wet surfaces of fabrics combined with high ozone may create Hydrogen Peroxide and result in bleached material. Avoid high humidity situations combined with high ozone concentrations.

COMMON ODORS ELIMINATED WITH OZONE

- Aged Books
- Hospital odors
- Alcohol Beverages (Bars, Lounges etc.)
- All organic waste
 - Pet Odors
 - Auto Exhaust
 - Bacteria
 - Kitchen Smells
- Oils and Greases
- Bathroom Odors
 - Body Odors
 - Burned Hair
 - Burned Food
- Carbon Monoxide
- Methyl Mercaptan (Pet Urine)
 - Mildew
 - Mold
- Cigarette Smoke
- Rotting and Decaying Substances
 - Most Organic Chemicals
 - Paint Fumes
 - Diesel Fumes
 - Ripe or Rotten Foods
 - Sewer Odors
 - Fish Odors
 - Smoke
- Stale or Stuffy Rooms or Buildings

OFFICE AND ENVIRONMENT (Unoccupied Areas)

- Garbage rooms
- Cigarette Smoke
 - Mold odors
 - Pet odors
 - Mildew odors
- Maintenance rooms
- Damp basements
- Storage rooms
- Smoking lounges
 - Restrooms
 - Meeting rooms

HOTELS & MOTELS

- Garbage compactors (Unoccupied areas)
 - Garbage areas
 - Linen rooms
- Change rooms (Pool)
- Kitchens
- Lounges
- Health clubs (Weight rooms, locker rooms, dirty linen rooms)
- Restaurant or commercial industrial exhaust stack and gas stream.

SHOPPING MALLS

- Food court garbage areas
- Garbage compactors

AUTOMOBILES & Rvs

- Cigarette Smoke
- Pet odors
- Mildew odors

PROPERTY MANAGEMENT

2. Rental houses (Unoccupied)
 3. Apartments (Unoccupied)
- Deodorizing between rentals for (tobacco, ethnic food cooking odors, pet odors)
 - Garbage rooms
 - Common recreation rooms
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July 2000

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