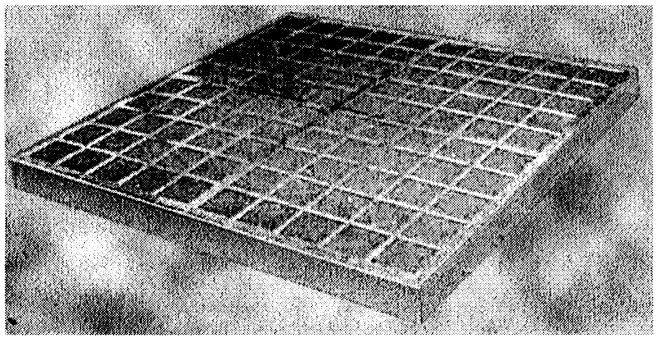
PHOENIX
RESTORATION EQUIPMENT

Carbon Filter Frames

Part # 4024764 & 4024891



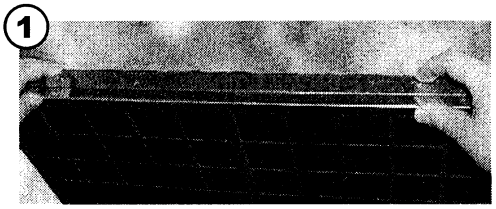
The **Guardian Carbon Filter Frames** are an improved way to provide gas and odor filtration. The 20-gauge galvanized metal frames are available in 24" x 24" x 2" (#4024764) for the Guardian HEPA System and 16" x 16" x 2" (#402891) for the Mini-Guardian HEPA System. The Carbon/Potassium Permanganate media to fill the frames is available in 5 gallon buckets (#4024528). This filter can be used instead of the Activated Carbon/Potassium Permanganate filter (#4023487) available for the Guardian HEPA System.

There are several advantages to using the Carbon Filter Frames instead of manufactured carbon filters:

- The Activated Carbon/Potassium Permanganate granules available in 5 gallon buckets is the same media blend found in the manufactured carbon filter, however, the media will stay "fresher" stored in the 5 gallon bucket.
- Loading the filter by the job provides the opportunity to adjust the amount of media in preportion to the amount of gas and odor removal required for the specific job.
- Substantial savings are realized by using the filter frame. The combined cost of the Guardian 24"x 24" x 2" Filter Frame ($50.00) and a 5 gallon bucket of media ($100.00) is $150.00. This provides slightly more than 4 fully filled frames and costs $120.00+ less than 4 of the manufactured Activated Carbon & Potassium Permanganate filters (#4023487). After the initial frame purchase, the cost to fully re-load the 24"x 24"x 2" filter is only $25.00 per use.

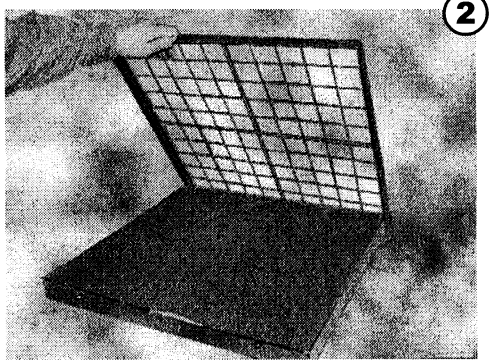
Replacement foam liners and honeycomb inserts are also available.

1



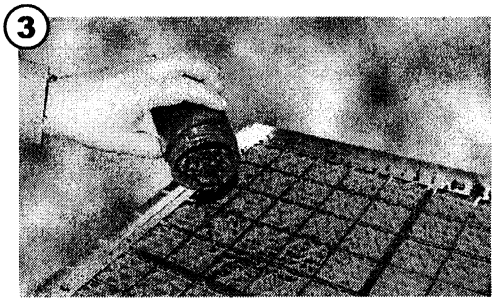
Depress the buttons on the filter frame.

2



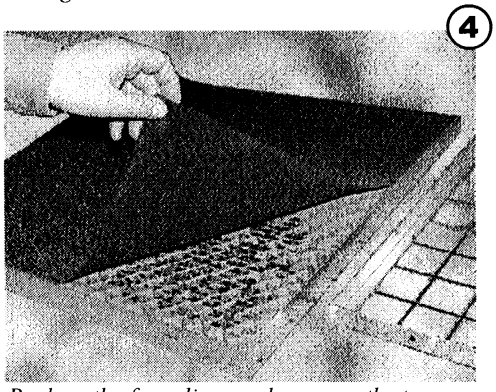
Open the frame and remove the foam filter liner.

3



Place the top of the filter frame up-side down on top of the honeycomb insert. Load the filter with the desired amount of activated Carbon/Potassium Permanganate blend from the 5 gallon bucket.

4



Replace the foam liner and resecure the top.

GUARDIAN HEPA SYSTEM

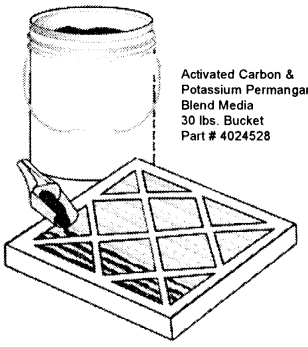
Therma-Stor

GAS & ODOR FILTRATION

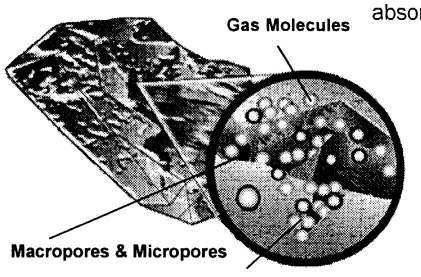
Gas and odor filtration is accomplished by adsorption filtration. Unlike particle filtration that captures particles as they travel through a media sieve, adsorption filtration attracts and holds gas molecules more like a sponge. This method of filtration relies on Van der Waal's forces. This is the natural attraction and capture of gas and liquid molecules to the surface of a solid. One of the keys to selecting a suitable adsorption filter media is the amount of surface area available for the attraction of gas molecules. Activated carbon is particularly well suited to this purpose because of the large surface area of charcoal. In fact, 7.5 pounds of activated carbon contains over one square mile of surface area. Potassium Permanganate chemically binds lower molecular weight compounds to its surface. This is called chemisorption.

The activated carbon and potassium permanganate blend granules available from Therma-Stor are effective on a wide variety gases. Activated carbon will adsorb 25 to 50 percent of its own weight in some specific chemical compounds or classes of compounds. Some other compounds will be adsorbed up to 10 to 25 percent of the weight of the carbon. There are some compounds that are poorly adsorbed by carbon. These are often reactive gases such as formaldehyde. The potassium permanganate granules are effective on many of these gases. The lower molecular weight compounds chemically bind to the surface of these granules. This is called chemisorption. The opposite side of this sheet contains the specific classes of compounds or common odors that can be effectively adsorbed. It should be noted that water vapor will be adsorbed as any other vapor. Operation in high humidity conditions will quickly diminish the capacity of the activated carbon. Dehumidification should be utilized to maximize the effectiveness of the activated carbon in humid conditions.

Activated carbon filters are available in a variety of sizes and weights. The activated carbon and potassium permanganate blend available from Therma-Stor is shipped in 30 pound buckets (5 gallon pail) and is easily added to the pleats of the standard 2 inch polyester and cotton media filter. This method is the most cost effective and practical way to add the gas and odor filtration feature.



The effective "life" of an adsorption filter relies entirely on the amount of gases adsorbed. The potassium permanganate granules will change color as they chemisorb gases. Starting as purple, they will move through brown and eventually turn white. We recommend replacement when white streaks, similar to salt stains, appear on the granules. Potassium permanganate granules will also give off a odor when they are no longer able to absorb additional gases.



Activated Carbon Granule

Activated Carbon Adsorption

Excellent Adsorption - 25% to 50% of Weight
Types Of Odors: Adhesives, Alcoholic Beverages, Antiseptics, Asphalt, Burned Foods & Fats, Charred Materials, Cigar & Cigarette Smoke, Cleaning Compounds, Cooking, Decaying Materials, Deodorants, Diesel Fumes, Fertilizers, Fish, Floral, Food, Gasoline, Lubricating Oils and Grease, Naptha, Organic Chemicals, Ozone, Paint & Varnish, Perfumes, Perspiration, Pet, Plastic & Rubber, Sewer, Smog, Tar and Turpentine.

Specific Chemicals & Compounds
A - Acetic Acid, Acetic Anhydride, Acrylic Acid, Acrylonitrile, Amyl Acetate, Amyl Alcohol, Amyl Ether, Aniline. **B** - Benzene, Bromine, Butanone, Butyl Acetate, Butyl Alcohol, Butyl Cellosolve, Butyl Chloride, Butyl Ether, Butyric Acid. **C** - Camphor, Caprylic Acid, Carbolic Acid, Carbon Disulfide, Carbon Tetrachloride, Cellosolve, Cellosolve Acetate, Chlorobenzene, Chlorobuadiene, Chloroform, Chloronitropropane, Chloropierin, Creosote, Cresol, Crotonaldehyde, Cyclohexane, Cyclohexanol, Cyclohexanone, Cyclohexene. **D** - Decane, Dibromoethane, Dichlorobenzene, Dichlorodifluromethane, Dichloroethane, Dichloroethylene, Dichloroethyl Ether, Dichloronitroethane, Dichloropropane, Dichlorotetrafluroethane, Diethyl Ketone, Dimethylaniline, Dimethylsulfate, Dioxane, Dipropyl Keytone. **E** - Ethyl Acetate, Ethyl Acrylate, Ethyl Alcohol, Ethyl Benzene, Ethyl Bromide, Ethyl Silicate, Ethylene Chlorohydrine, Ethylene Dichloride, Eucalyptole. **H** - Heptane, Heptylene, **I** - Indole, Iodine, Idoform, Isophorone, Isopropyl Acetate, Isopropyl Alcohol, Isopropyl Ether, Kerosene. **L** - Lactic Acid. **M** - Menthol, Mercaptans, Mesityl Oxide, Methyl Acrylate, Methyl Butyl Ketone, Methyl Cellosolve, Methyl Cellosolve Acetate, Methyl Chloroform, Methyl Ethyl Ketone, Methyl Mercaptan, Methylcyclohexane, Methylcyclohexanol, Methylcyclohexanone, Methylene Chloride, Monochlorobenzene, Monoflurotrichloromethane. **P** - Palmitic Acid, Paradichlorobenzene, Pentanone, Perchloroethylene, Phenol, Propionic Acid, Propyl Acetate, Propyl Alcohol, Propyl Chloride, Propyl Ether, Propyl Mercaptan, Putrescine, Pyridine. **S** - Skatole, Styrene Monomer, Sulfuric Acid. **T** - Tetrachloroethylene, Toluene, Toluidine, Trichloroethylene, Trichloroethane, Turpentine. **U** - Urea, Uric Acid. **V** - Valeric Acid, Valericaldehyde. **X** - Xylene.

Good Adsorption - 10% to 25% of Weight
Types of Odors: Animal, Anesthetics, Bleaching Solutions, Coal Smoke, Combustion, Corrosive Gases, Film Processing, Inorganic Chemicals, Mold, Solvents, Volitile Chemicals.

Specific Chemicals & Compounds
A - Acetone, Acrolein. **B** - Borane, Butadiene, Butyraldehyde. **C** - Chlorine. **D** - Dichloromonofluormethane, Diethylamine. **E** - Ether, Ethyl Amine, Ethyl Chloride, Ethyl Ether, Ethyl Formate, Ethyl Inercaptan, Ethylene Oxide. **H** - Hexane, Hexylene, Hexyne, Hydrogen Bromide, Hydrogen Cyanide, Hydrogen Iodide, Hydrogen Sulfide, **I** - Isoprene. **M** - Methyl Acetate, Methyl Alcohol, Methyl Bromide, Methyl Chloride, Methyl Ether, Methyl Formate. **N** - Nitric Acid. **P** - Pentane, Pentylene, Pentyne, Phosgene, Propionaldehyde. **V** - Vinyl Chloride.

Potassium Permanganate Chemisorption

Excellent Chemisorption - Chemically Bonded Adsorption
A- Acetic Acid, Acrolein, Aldehydes, **F**- Formaldehyde, **G**-- Gluteraldehyde. **H**- Hydrogen Cyanide, Hydrogen Sulfide. **M**- Mercaptans. **N**- Nitric Oxide, Nitrogen Dioxide, **S**- Sulfur Dioxide, Sulfur Trioxide.