

THE ESSENCE OF

INDOOR AIR...



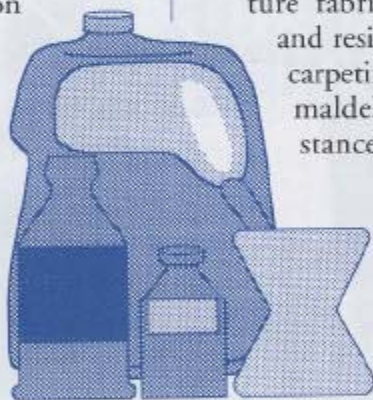
ODOR AND FUME ADSORPTION

PERMATRON[®]

A RECURRING PROBLEM

Before the onset of the 1970's energy crisis, energy was cheap and buildings were constructed as inexpensively as possible. The resulting high ventilation rates, by design and by unplanned infiltration, were enough to dilute indoor air contaminants. As the cost of energy increased, two changes occurred: ventilation rates were decreased to reduce building energy costs and infiltration was virtually eliminated through tighter construction techniques. Contaminants produced in the space were trapped and allowed to accumulate, causing health problems to building occupants which had never before been experienced.

An estimated 4 million chemical compounds now exist in the environment, most of them new in our lifetime. About 63,000 are commonly used in America, and another 1,000 or so are being synthesized every day. Some are healthy, some are harmless, and some are highly toxic. Chronic chemical sensitivity, along with cases of outright poisoning, have become widespread. Studies show that the air in our homes and work places, where we spend 60 to 90 percent of our lives, is now commonly more polluted than outside air – up to 10 times as dirty – with some pollutants reaching concentrations that would be illegal in the atmosphere. Contamination comes from common household chemicals, combustion by-products and radon gas. Contaminants have been, in effect, quietly emanating fumes (“off-gassing”) into room air for



years. They pose numerous health threats including a higher risk of cancer, respiratory illnesses and eye, skin and throat irritations. These illnesses lead to absenteeism, reduced productivity, increased insurance rates and sometimes liability and litigation. Roughly 4 to 5 million Americans already suffer from the effects of chemically induced environmental illnesses.

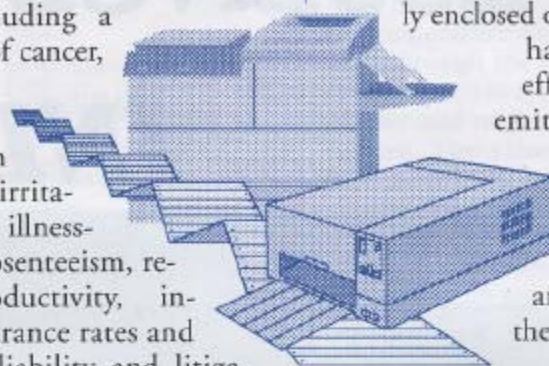
Organic chemicals are found in many consumer products. Office furnishings like adhesives, furniture fabrics, oil-based paints and resins, new cabinets and carpeting typically emit formaldehyde and other substances. Dyes, strippers/solvents, aerosol sprays, stored fuels, glues, detergents, and preservatives can often be found in commercial and manufacturing facilities. Moisture, food smells, cigarette smoke and awkward human odors from everyday activities can accumulate to uncomfortable levels through public facilities. Motor vehicles operating in closed garages, air intake grills along loading docks, main traffic streets or bus stops can draw air into buildings laden with exhaust fumes (carbon monoxide, carbon dioxide and volatile hydro-carbons) as well as garbage odors. Modern

buildings often have completely enclosed offices that tend to have a condensing effect on chemicals emitted from office machines. Or, the air that is circulated may be coming from an area polluted either with toxic or unpleasant fumes

and cause a buildup of chemical vapors and gases. Sick building syndrome and building-related illness are the names given to a growing public health problem that exposes workforces and homeowners to an insidious combination of pollutants that are invisible, sometimes odorless, but serious threats to health.

Air quality control should become part of a building's overall maintenance program. An estimated one-fifth to one-third of U.S. buildings are considered “sick.” It is also estimated that indoor air pollution costs our nation as much as \$100 billion a year in medical costs and lost days at work, plus diminished employee production. In addition, workers, frustrated with their inability to effect change in their work place, are increasingly turning to the courts and Congress to air their complaints.

Placing a building under a continual IAQ management plan and installing the proper ventilation/air filtration equipment will cost less in the long run.



AN EFFECTIVE SOLUTION

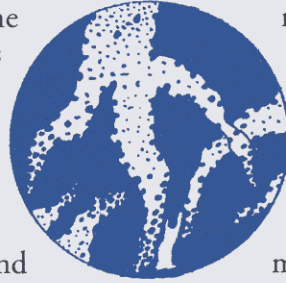
Activated carbon, as well as several other compounds, is widely recognized as an effective method of removing and preventing odor/fume buildup in recirculated air. Utilizing the finest quality carbon coatings, Permatron offers a line of high efficiency odor and fume removing air filters, bulk media and pads cut to size. Synthetic media substrates are impregnated with finely ground coatings, such as activated carbon or zeolite (a variety of substrates and coatings available on request), and heat set to retain those coatings even when the media is rinsed or vacuumed.

Just as a sponge soaks up water, Permatron's activated carbon media adsorbs odors and fumes. Noxious odors are pulled and held by

molecular action into millions of tiny pores in the media coating. This means that the odor causing molecules are actually removed from the air permanently, not masked with another odor.

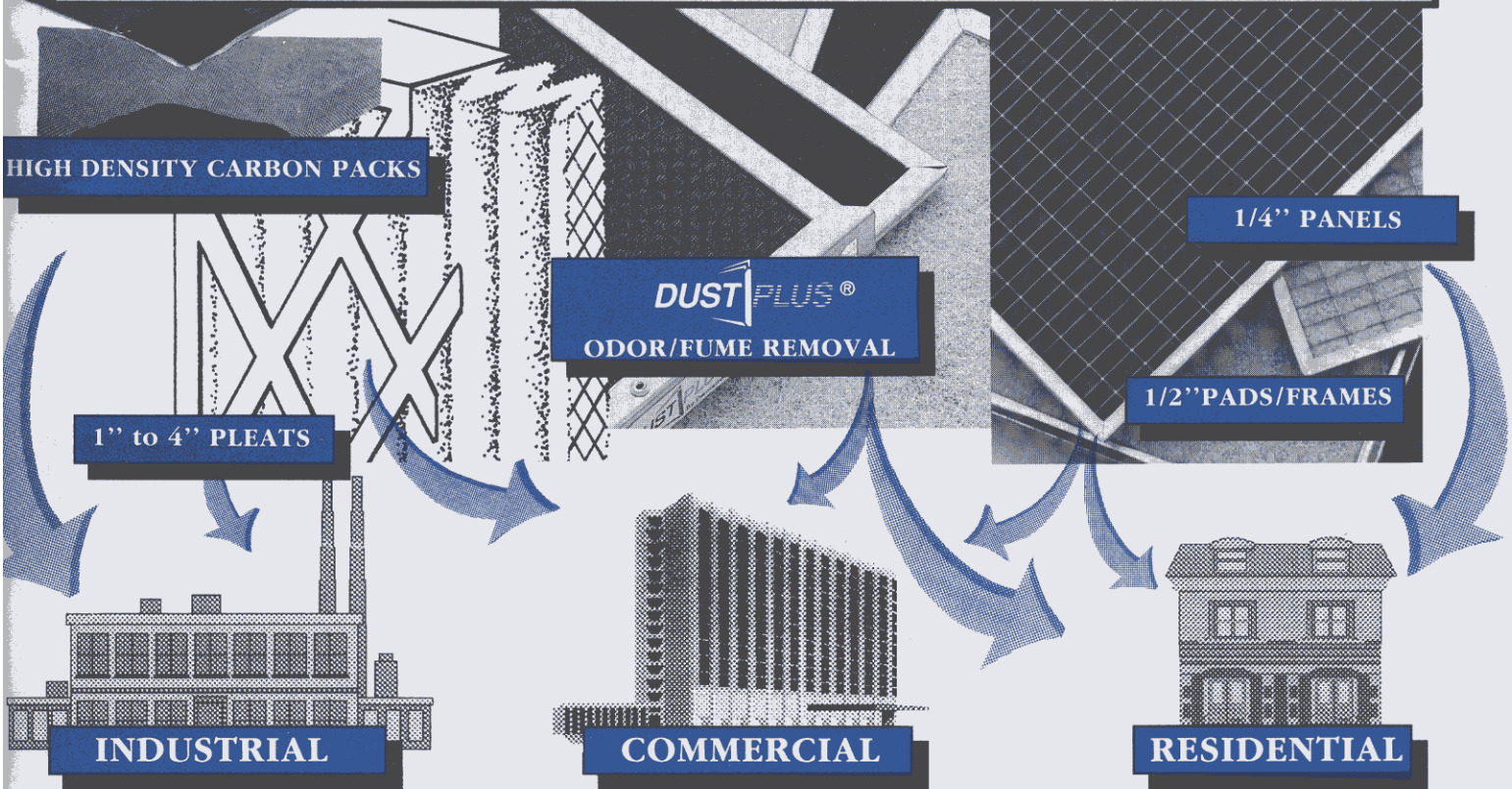
Air velocity, humidity and temperature can influence the odor elimination process. At times of high odor generation, air should recirculate through the filter to achieve maximum effectiveness. Permatron's filters will not interfere with air flow and air balance if cleaned of clogging dust particles regularly.

The rate of adsorption depends on the relationship between the pore



structure, or surface area, and the shape of the contaminating molecules. The activated carbon is ground to an extremely fine particle size to increase the surface area available for adsorption. By impregnating activated coatings on a dust filtration media, Permatron's odor and fume removing air filters achieve a dual filtration effect. The synthetic media filters the particulate matter, while the activated coating adsorbs the gas or vapor contaminants. Additional coatings are available: Activated Aluminum, Antimicrobial, Conductive Carbon, Potassium Carbonate, Silica Gel, Activated Carbon (Ozone), Activated Carbon (Formaldehyde).

MULTIPLE PRODUCTS...MULTIPLE APPLICATIONS



- ★ Printing Companies
- ★ Paper Mills
- ★ Food Processing Plants

- ★ Hospitals/Laboratories
- ★ Office Buildings
- ★ Airports/Stadiums

- ★ Single Family Homes
- ★ Condominiums/Townhomes
- ★ Trailers/Mobile Homes

ACTIVATED CARBON ADSORBENCY OF SELECTED MATERIALS & ODORS

ACETALDEHYDE	2	ETHYL ACETATE	4	NICOTINE	4
ACETIC ACID	4	ETHYL ACRYLATE	4	* NITRIC ACID	3
ACETIC ANHYDRIDE	4	ETHYL ALCOHOL	4	NITRO BENZENE	4
ACETONE	3	* ETHYL AMINE	3	NITROETHANE	4
* ACETYLENE	1	ETHYL BENZENE	4	* NITROGEN DIOXIDE	2
* ACROLEIN	3	ETHYL BROMIDE	4	NITROGLYCERINE	4
ACRYLIC ACID	4	ETHYL CHLORIDE	3	NITROMETHANE	4
ACRYLONITRILE	4	ETHYL ETHER	3	NITROPROPANE	4
ADHESIVES	4	ETHYL FORMATE	3	NITROTOLUENE	4
AIR-WICK	4	ETHYL MERCAPTAN	3	NONANE	4
ALCOHOLIC BEVERAGES	4	ETHYL SILICATE	4	NOXIOUS GASES	3
* ALINES	2	* ETHYLENE	1	OCTALENE	4
* AMMONIA	2	ETHYLENE CHLOROHYDRIN	4	OCTANE	4
AMYL ACETATE	4	ETHYLENE DICHLORIDE	4	ODORANTS	4
AMYL ALCOHOL	4	ETHYLENE OXIDE	3	ONIONS	4
AMYL ETHER	4	ESSENTIAL OILS	4	ORGANIC CHEMICALS	4
ANIMAL ODORS	3	EUCALYPTOLE	4	OZONE	4
ANESTHETICS	3	EXHAUST FUMES	3	PACKING HOUSE ODORS	4
ANILINE	4	FEMALE ODORS	4	PAINT AND REDECORATING ODORS	4
ANTISEPTICS	4	FERTILIZER	4	PALMITIC ACID	4
ASPHALT FUMES	4	FILM PROCESSING ODORS	3	PAPER DETERIORATIONS	4
AUTOMOBILE EXHAUST	3	FISH ODORS	4	PARADICHLOROBENZENE	4
BATHROOM SMELLS	4	FLORAL SCENTS	4	PASTE AND GLUE	4
BENZENE	4	FLUOROTRICHLOROMETHANE	3	PENTANE	3
* BLEACHING SOLUTIONS	3	FOOD AROMAS	4	PENTANONE	4
BODY ODORS	4	* FORMALDEHYDE	2	* PENTYLENE	3
BORANE	3	* FORAIC ACID	3	* PENTYNE	3
BROMINE	4	FUEL GASES	2	PERCHLOROETHYLENE	4
BURNED FLESH	4	FUMES	3	PERFUMES, COSMETICS	4
BURNED FOOD	4	GANGRENE	4	PERSPIRATIONS	4
BURNING FAT	4	GARLIC	4	PERSISTENT ODORS	4
BUTADIENE	3	GASOLINE	4	PET ODORS	4
BUTANE	2	HEPTANE	4	PHENOL	4
BUTANONE	4	HEPTYLENE	4	PHOSGENE	3
BUTYL ACETATE	4	HEXANE	3	PITCH	4
BUTYL ALCOHOL	4	* HEXYLENE	3	PLASTICS	4
BUTYL CELLOSOLVE	4	* HEXYNE	3	POISON GASES	3
BUTYL CHLORIDE	4	HOSPITAL ODORS	4	POLLEN	3
BUTYL ETHER	4	HOUSEHOLD SMELLS	4	POPCORN AND CANDY	4
* BUTYLENE	2	HYDROGEN	1	POULTRY ODORS	4
* BUTYNE	2	* HYDROGEN BROMIDE	3	PROPANE	2
* BUTYRALDEHYDE	3	* HYDROGEN CHLORIDE	2	* PROPIONALDEHYDE	3
BUTYRIC ACID	4	* HYDROGEN CYANIDE	3	PROPIONIC ACID	4
CAMPHOR	4	* HYDROGEN FLUORIDE	2	PROPYL ACETATE	4
CANCER ODOR	4	* HYDROGEN IODIDE	3	PROPYL ALCOHOL	4
CAPRYLIC ACID	4	* HYDROGEN SELENIDE	2	PROPYL CHLORIDE	4
CARBOLIC ACID	4	* HYDROGEN SULFIDE	3	PROPYL ETHER	4
CARBON DISULFIDE	4	INCENSE	4	PROPYL MERCAPTAN	4
* CARBON DIOXIDE	1	INDOLE	4	* PROPYLENE	2
CARBON MONOXIDE	1	INORGANIC CHEMICALS	4	* PROPYNE	2
CARBON TETRACHLORIDE	4	INCOMPLETE COMBUSTION	3	PUTREFYING SUBSTANCES	3
CELLOSOLVE	4	INDUSTRIAL WASTES	3	PUTRESCINE	4
CELLOSOLVE ACETATE	4	IODINE	4	PYRIDINE	4
CHARRED MATERIALS	4	IDOFORM	4	RADIATION PRODUCTS	2
CHEESE	4	IRRITANTS	4	RADON	3
* CHLORINE	3	* ISOPHORONE	4	RANCID OILS	4
CHLOROBENZENE	4	* ISOPRENE	3	RESINS	4
CHLOROBADIENE	4	ISOPROPYL ACETATE	4	REODORANTS	4
CHLOROFORM	4	ISOPROPYL ALCOHOL	4	RIPENING FRUITS	4
CHLORONITROPROPANE	4	ISOPROPYL ETHER	4	RUBBER	4
CHLOROPIERIN	4	KEROSENE	4	SAUERKRAUT	4
CIGARETTE SMOKE ODOR	4	KITCHEN ODORS	4	SEWER ODORS	4
CITRUS AND OTHER FRUITS	4	LACTIC ACID	4	SKATOLE	4
CLEANING COMPOUNDS	4	LINGERING ODORS	4	SLAUGHTERING ODORS	3
COAL SMOKE ODOR	3	LIQUID FUELS	4	SMOG	4
COABUSTION ODORS	3	LIQUOR ODORS	4	SOAPS	4
COOKING ODORS	4	LUBRICATING OILS AND GREASES	4	SMOKE	4
* CORROSIVE GASES	3	LYSOL	4	SOLVENTS	3
CREOSOTE	4	MASKING AGENTS	4	SOUR MILKS	4
CRESOL	4	MEDICINAL ODORS	4	SPILLED BEVERAGES	4
CROTONALDEHYDE	4	MELONS	4	SPOILED FOOD STUFFS	4
CYCLOHEXANE	4	MENTHOL	4	STALE ODORS	4
CYCLOHEXANOL	4	MERCAPTANS	4	STODDARD SOLVENT	4
CYCLOHEXANONE	4	MESITYL OXIDE	4	STUFFINESS	4
CYCLOHEXENE	4	METHANE	1	STYRENE MONOMER	4
DEAD ANIMALS	4	METHYL ACETATE	3	* SULFUR DIOXIDE	2
DECANE	4	METHYL ACRYLATE	4	* SULFUR TRIOXIDE	3
DECAYING SUBSTANCES	4	METHYL ALCOHOL	3	SULFURIC ACID	4
DEODORANTS	4	METHYL BROMIDE	3	TAR	4
DETERGENTS	4	METHYL BUTYL KETONE	4	* TARNISHING GASES	3
DIBROMOETHANE	4	METHYL CELLOSOLVE	4	TETRACHLOROETHYLENE	4
DICHLOROBENZENE	4	METHYL CELLOSOLVE ACETATE	4	THEATRICAL MAKEUP ODOR	4
DICHLORODIFLUOROMETHANE	4	METHYLCHLORIDE	3	TOBACCO SMOKE ODOR	4
DICHLOROETHANE	4	METHYL CHLOROFORM	4	TOILET ODORS	4
DICHLOROETHYLENE	4	METHYL ETHER	3	TOLUENE	4
DICHLOROETHYL ETHER	4	METHYL ETHYL KETONE	4	TOLUIDINE	4
DICHLOROMONOFUOROMETHANE	3	METHYL FORCATE	3	TRICHLOROETHYLENE	4
DICHLORONITROETHANE	4	METHYL AERCAPTAN	4	TRICHLOROETHANE	4
DICHLOROPROPANE	4	METHYLCYCLOHEXANE	4	TURPENTINE	4
DICHLOROTETRAFLUOROETHANE	4	METHYLCYCLOHEXANOL	4	UREA	4
DIESEL FUMES	4	METHYLCYCLOHEXANONE	4	URIC ACID	4
* DIETHYLAMINE	3	METHYLENE CHLORIDE	4	VALERIC ACID	4
DIETHYL KETONE	4	MILDEW	3	VALERICALDEHYDE	4
DIMETHYLANILINE	4	MIXED ODORS	3	VINEGAR	4
DIMETHYLSULFATE	4	MOLD	3	VINYL CHLORIDE	3
DIOXANE	4	MONOCHLOROBENZENE	4	VOLATILE MATERIALS	3
DIPROPYL KETONE	4	MONOFUOROTRICHLOROMETHANE	4	WASTE PRODUCTS	4
DISINFECTANTS	4	MOTH BALLS	4	WOOD ALCOHOL	3
EMBALMING ODORS	4	NAPHTHA (COAL TAR)	4	XYLENE	4
ETHANE	1	NAPHTHA (PETROLEUM)	4		
ETHER	3	NAPHTHALENE	4		

Some contaminants listed in the table use specific chemical compounds, some represent classes of components, and others are mixtures and of variable composition. Activated carbon's capacity for odors varies somewhat with the concentration of air, humidity, temperature and the actual velocity used through the filters. The numbers given represent typical or average conditions and might vary in specific instances. The values in the table have been assembled from many sources including laboratory tests and field experience. This table should be used as a general rule only. The capacity index has the following meaning:

4. High capacity for all materials in this category. One pound takes up about 20% to 50% of its own weight—average about 1/3 (33-1/3%). This category includes most of the odor causing substances.
3. Satisfactory capacity for all items in this category. These constitute good applications but the capacity is not as high as for category 4. Adorbs about 10% to 25% of its weight—average about 1/6 (16.7%).
2. Includes substances which are not highly adsorbed but which might be taken up sufficiently to give good service under the particular conditions of operation. These require in dividual checking.
1. Adsorbtion capacity is low for these materials. Activated carbon cannot be satisfactorily used to remove them under ordinary circumstances.

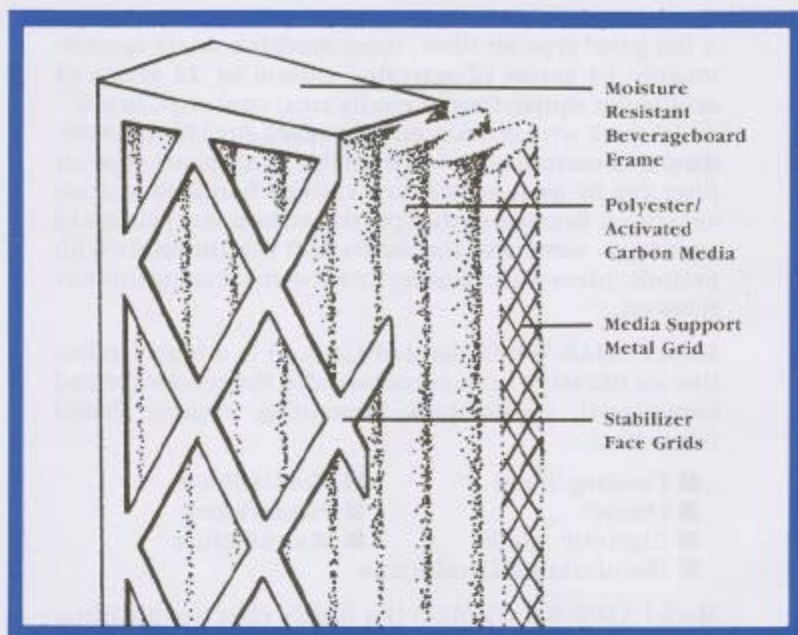
* Straight activated carbon does not have much capacity for some reactive gases, such as ammonia, formaldehyde, etc. In some cases where the gas is chemically reactive, appropriate impregnated activated carbon can be recommended. Those odorants marked above with an asterisk fall into this category.

**CALL OUR TOLL-FREE
TECHNICAL ASSISTANCE
LINE
1-800-882-8012**



Available from:

ACTIVATED CARBON PLEATS



Developed to increase the surface area of activated carbon exposed to air flow and to hold a larger amount of contaminants, this 1", 2" or 4" pleated air filter contains approximately 14 grams of activated carbon per square foot of media area. For example, a 24" x 24" x 2" pleated filter contains approximately 12 square feet of effective media face area, versus 4 square feet for a flat panel type air filter. The pleated filter may be installed with pleats either vertical or horizontal. Pleats are also available in zeolite for ammonia based odor/fume applications. Call for pricing and availability of zeolite filters.

Highly effective in applications containing large, continuous amounts of organic based odors, these filters are recommended for usage in facilities such as:

- Airports
 - Computer Rooms
 - Hospitals
 - Restaurants/Bars
 - Public Facilities
 - Salons
- Industrial Facilities
 - Nursing Homes
 - Dry Cleaners
 - Animal Care Facilities
 - Stadiums
 - Printing Facilities

TECHNICAL DATA

Model CHAR-PLEAT 1": Initial Resistance .13 in w.g. (300 fpm/1200 cfm); Average Arrestance Efficiency 88%; Dust Holding Capacity 175 GM at 1.0 inch w.g.

Model CHAR-PLEAT 2": Initial Resistance .10 in w.g. (300 fpm/1200 cfm); .25 in w.g (500 fpm /2000 cfm); Average Arrestance Efficiency 86%; Dust Holding Capacity 290 GM at 1.0 inch w.g.

Model CHAR-PLEAT 4": Initial Resistance .08 in w.g. (300 fpm/1200 cfm); .19 in w.g. (500 fpm/2000 cfm); Average Arrestance Efficiency 85%; Dust Holding Capacity 460 GM at 1.0 inch w.g.

PERFORMANCE DATA						
Nominal Size*	1" Charcoal Pleat (14 Pleats per Linear Foot)		2" Charcoal Pleat (10 Pleats per Linear Foot)		4" Charcoal Pleat (8 Pleats per Linear Foot)	
	Media Area (sq ft)	Carbon (grams)	Media Area (sq ft)	Carbon (grams)	Media Area (sq ft)	Carbon (grams)
10 x 20	2.26	31.64	3.75	52.50	6.46	90.44
12 x 20	2.73	38.22	4.54	63.56	7.83	109.62
14 x 20	3.21	44.94	5.33	74.62	9.19	128.66
14 x 25	4.03	56.42	6.70	93.80	11.54	161.56
15 x 20	3.45	48.30	5.72	80.08	9.87	138.18
16 x 20	3.68	51.52	6.12	85.68	10.55	147.70
20 x 20	4.63	64.82	7.70	107.80	13.27	185.78
16 x 25	4.63	64.82	7.70	107.80	13.27	185.78
20 x 25	5.82	81.48	9.67	135.38	16.67	233.38
12 x 24	3.29	46.06	5.47	76.58	9.43	132.02
24 x 24	6.73	94.22	11.18	156.52	19.27	269.78
18 x 24	5.01	70.14	8.33	116.62	14.35	200.90
20 x 24	5.58	78.12	9.28	129.92	15.99	223.86

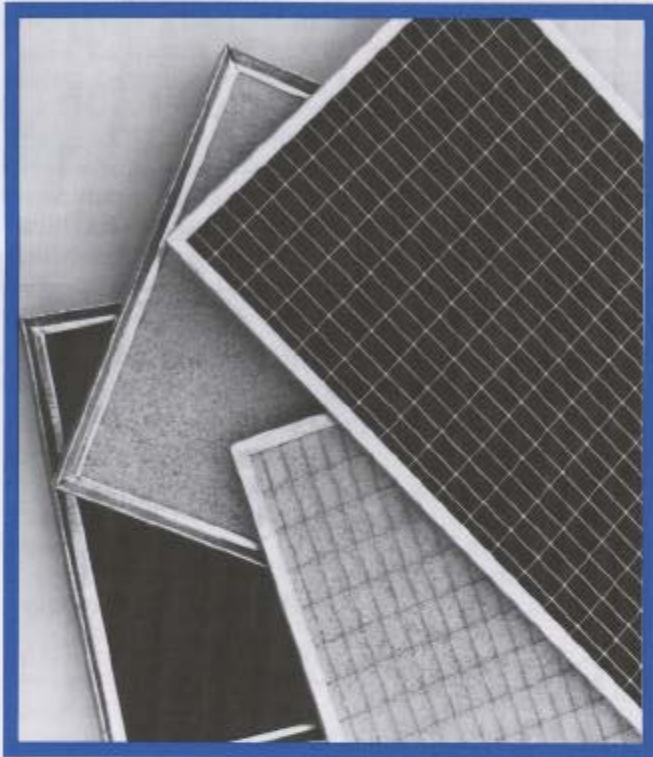
*All nominal filters have an actual size 1/2" less in width and height, 1/4" less in depth than listed.



TOLL-FREE TECHNICAL ASSISTANCE

1-800-882-8012

ACTIVATED CARBON AND ZEOLITE PANELS



A flat panel type air filter, these models contain approximately 14 grams of activated carbon or 22 grams of zeolite per square foot of media area, contained in a 1/4" or 1" thick wire reinforced galvanized steel frame. Standard and custom sizes are available. This panel type air filter can be used for air flow systems handling high air velocities. Because of the specialized bonding process of coating to substrate, the media will remain intact with periodic plain water rinsing or vacuum cleaning for dust removal.

Model CHAR-WR (Activated Carbon) is a highly effective air filtration unit, recommended for residential and commercial applications containing organic based odors like:

- Cooking/Food
- Ozone
- Cigarette Smoke
- Disinfectants/Deodorants
- Mold/Mildew
- Paint/Fumes
- Waste/Refuse

Model AMN-WR (Zeolite) is a highly effective air filtration unit for adsorbing ammonia based odors frequently found in residential and commercial applications like:

- Nurseries/Child Care Facilities
- Animal Facilities
- Hospitals/Sick Rooms/Nursing Homes
- Public Rest Rooms

TECHNICAL DATA

Model CHAR-WR: Initial Resistance .14 in w.g. (300 fpm/1200 cfm); Average Arrestance Efficiency 81%; Dust Holding Capacity 80 GM at 1.0 inch w.g.

Model AMN-WR: Initial Resistance .17 in w.g. (300 fpm/1200 cfm); Average Arrestance Efficiency 80%; Dust Holding Capacity 105 GM at 1.0 inch w.g.

PERFORMANCE DATA				
Nominal Size*	1/4" Charcoal Panel		1/4" Zeolite Panel	
	Media Area (sq ft)	Carbon (gms)	Media Area (sq ft)	Zeolite (gms)
10 x 20	1.39	19.44	1.39	30.56
12 x 20	1.67	23.33	1.67	36.67
14 x 20	1.94	27.22	1.94	42.78
14 x 25	2.43	34.03	2.43	53.47
15 x 20	2.08	29.17	2.08	45.83
16 x 20	2.22	31.11	2.22	48.89
20 x 20	2.78	38.89	2.78	61.11
16 x 25	2.78	38.89	2.78	61.11
20 x 25	3.47	48.61	3.47	76.39
12 x 24	2.00	28.00	2.00	44.00
24 x 24	4.00	56.00	4.00	88.00
18 x 24	3.00	42.00	3.00	66.00
20 x 24	3.33	46.67	3.33	73.33

*All nominal filters have an actual size 3/8" less in width and height.



TOLL-FREE TECHNICAL ASSISTANCE
1-800-882-8012

HIGH DENSITY ACTIVATED CARBON PACKS



Maximum density carbon filters designed for heavy odor/fume control in commercial and industrial applications. Large quantities (150, 300, 600 and 900 grams per square foot) of 60% minimum activity carbon are contained within flexible nylon mesh. Granular carbon that will not settle. Adsorption process does not affect pressure drop because gases are adsorbed inside carbon and do not build up on the outside. High density packs should be properly prefiltered (prefilters also available from Permatron). Standard and custom sizes available in flexible pad form, encased in a disposable cardboard stabilizing frame or a permanent galvanized or stainless steel pad stabilizing frame. Thickness: CW150- $\frac{3}{8}$ " , CW300- $\frac{3}{8}$ " , CW600-1 $\frac{1}{2}$ " to 1 $\frac{3}{4}$ " and CW 900-2 $\frac{1}{4}$ " (without stabilizing frames.)

TECHNICAL DATA

- Model CW150:** Initial Resistance .15 in w.g. (300 fpm/1200 cfm); Average Arrestance Efficiency N/A; Dust Holding Capacity N/A.
- Model CW300:** Initial Resistance .23 in w.g. (300 fpm/1200 cfm); Average Arrestance Efficiency 80-86%; Dust Holding Capacity 235 GM at 1.2 inch w.g.
- Model CW600:** Initial Resistance .45 in w.g. (300 fpm/1200 cfm); Average Arrestance Efficiency N/A; Dust Holding Capacity N/A.

PERFORMANCE DATA						
Nominal Size*	CW150		CW300		CW600	
	High Density Charcoal		High Density Charcoal		High Density Charcoal	
	Media Area (sq ft)	Carbon (gms)	Media Area (sq ft)	Carbon (gms)	Media Area (sq ft)	Carbon (gms)
10 x 20	1.39	208.33	1.39	416.67	1.39	833.33
12 x 20	1.67	250.00	1.67	500.00	1.67	1000.00
14 x 20	1.94	291.67	1.94	583.33	1.94	1166.67
14 x 25	2.43	364.58	2.43	729.17	2.43	1458.33
15 x 20	2.08	312.50	2.08	625.00	2.08	1250.00
16 x 20	2.22	333.33	2.22	666.67	2.22	1333.33
20 x 20	2.78	416.67	2.78	833.33	2.78	1666.67
16 x 25	2.78	416.67	2.78	833.33	2.78	1666.67
20 x 25	3.47	520.83	3.47	1041.67	3.47	2083.33
12 x 24	2.00	300.00	2.00	600.00	2.00	1200.00
24 x 24	4.00	600.00	4.00	1200.00	4.00	2400.00
18 x 24	3.00	450.00	3.00	900.00	3.00	1800.00
20 x 24	3.33	500.00	3.33	1000.00	3.33	2000.00

*All nominal filters have an actual size 1/16" less in width and height.

PERMATRON®

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1-800-882-8012