ACTIVE CARBON ADSORPTION EFFICIENCY

Genano air purifiers utilize a high-quality active carbon with a highly porous structure. Each gram of active carbon has a surface area of approx. 900 m^2.

For instructions on changing the active carbon collector, please see the unit service manuals. This document withholds information about the adsorption efficiency of the active carbon.

HOW ACTIVE CARBON WORKS

Vapour-phase impurities are removed in three steps:

1. Transport of contaminant to the surface of active carbon;
2. Diffusion of the contaminant into the structure; and
3. Attraction of the contaminant to an interior surface by van der Waals forces.

Contaminant removal efficiency is dependent on many factors. The removal efficiency generally improves with increasing molecular mass, boiling point and concentration of the contaminant.

ADSORPTION EFFICIENCY FOR VARIOUS CHEMICAL COMPOUNDS

Capacity index (noncommittal data):

4 – Good adsorption: High capacity for compounds in this category. Active carbon takes up between 20 and 50% of its dead weight in gaseous materials. Average separating ability for gaseous materials in this category is approx. 35% of the dead weight of the active carbon. This category contains most odour-causing (smelly) substances.

3 – Satisfactory adsorption: Satisfactory capacity for compounds in this category. Active carbon takes up between 10 and 20% of its dead weight. Average receptiveness for gaseous materials in this category is approx. 15% of the dead weight of the active carbon.

2 – Still considerable adsorption: Includes compounds which are not highly adsorbed but may be taken up sufficiently to give satisfactory results in the operating conditions.

1 – Very low adsorption: The adsorption is low for these compounds. Active carbon cannot be satisfactorily used to remove them in ordinary circumstances.

Compound	Molecular formula	Capacity index	Synonyms
1-Pentanol	$C_5H_{12}O$	4	n-Pentanol
2-Chlorobuta-1,3-diene	C_4H_5Cl	4	Chloroprene, 2-Chloro-1,3-butadiene, Chlorobutadiene
Acetaldehyde	C_2H_4O	1	Acetic aldehyde, ethanal, ethyl aldehyde
Acetic acid	$C_2H_4O_2$	4	Ethanoic acid, methanecarboxylic acid
Acetic anhydride	$C_4H_6O_3$	4	Acetic acid anhydride, Acetic oxide, Acetyl oxide
Acetone	C_3H_6O	3	Dimethyl ketone, ketone propane, 2-propanone
Acrolein	C_3H_4O	2	Acraldehyde, acrylaldehyde, acrylic aldehyde, allyl aldehyde, propenal, 2-propenal
Acrylic acid	$C_3H_4O_2$	4	Acroleic acid, ethylenecarboxylic acid, propenoic acid
Acrylonitrile	C_3H_3N	4	Acrylonitrile monomer, cyanoethylene, propenenitrile, vinyl cyanide
Amine		1	
Ammonia	NH_3	1	Anhydrous ammonia
Amyl ether	$C_{10}H_{22}O$	4	Pentyl ether, amyl ether, diamyl ether
Aniline	C_6H_7N	4	Aminobenzene, aniline oil, benzamine, phenylamine
Benzene	C_6H_6	4	Benzol, phenyl hydride
Bromine	Br_2	4	
Butadiene	C_4H_6	3	Biethylene, bivinyl, divinyl, erythrene, vinylethylene
Butanal	C_4H_8O	1	Butyraldehyde
Butane	C_4H_{10}	2	Butyl hydride, methylethylmetane
Butanoic acid	$C_4H_8O_2$	4	Butyric acid, propanecarboxylic acid
Butanone	C_4H_8O	4	Ethyl methyl ketone, methyl acetone, methyl ethyl ketone, MEK, methylpropanone
Butyl acetate	$C_6H_{12}O_2$	4	Butyl ethanoate, butile, acetic acid n-butyl ester
Butyl alcohol	$C_4H_{10}O$	4	Butanol
Butyl chloride	C_4H_9Cl	4	
Butyl ether	C_4H_8O	4	
Butyl ethyl ketone	$C_7H_{14}O$	4	3-heptanone, ethyl-butyl ketone, EBK
Camphor	$C_{10}H_{16}O$	4	2-camphanone, formosa, 2-bornanone
Caprylic acid	$C_8H_{16}O_2$	4	Octanoic acid
Carbon dioxide	CO_2	1	Carbon acid gas, dry ice
Carbon disulphide	CS_2	4	Carbon bisulfide, methanedithione
Carbon monoxide	CO	1	Carbon oxide, monoxide
Chlorine	Cl_2	2	
Chlorobenzene	C_6H_5Cl	4	Benzene chloride, phenyl chloride, chlorobenzol
Chloroethylene	C_2H_3Cl	3	Vinyl chloride, vinyl chloride monomer, VCM, chloroethene
Chloroform	$CHCl_3$	4	Trichloromethane, methyl trichloride
Creatine	$C_4H_9N_3O_2$	4	Methylguanidoacetic acid
Cresol	C_7H_8O	4	Hydroxytoluene, cresylic acid, hydroxymethylbenzene
Cyclohexane	C_6H_{12}	4	Hexanaphthene
Cyclohexanol	$C_6H_{12}O$	4	Cyclohexyl alcohol, hexahydrophenol, hydrophenol, hexalin, hydralin
Cyclohexene	C_6H_{10}	4	Tetrahydrobenzene, benzenetetrahydride, hexanaphthylene
Decane	$C_{10}H_{22}$	4	
Dibromomethane	CH_2Br_2	4	Methyl dibromide, methylene dibromide
Dichlorobenzene	$C_6H_4Cl_2$	4	DCB
Dichlorodifluoromethane	CCl_2F_2	4	Carbon dichloride difluoride, difluorodichloromethane, Freon 12, CFC-12
Dichloroethane	$C_2H_4Cl_2$	4	DCE
Dichlorodiethyl ether	$C_4H_8Cl_2O$	4	Bis(2-chloroethyl) ether, Chlorex, DCEE, Chloroethyl ether, Dichloroethyl ether
Dichloroethylene	$C_2H_2Cl_2$	4	Dichloroethene, vinylidene chloride
Dichlorofluoromethane	$CHCl_2F$	3	Fluorodichloromethane, Freon 21
Dichloronitroethane	$C_2H_3O_2NCl_2$	4	
Dichloropropane	$C_3H_6Cl_2$	4	Propylene dichloride
Dichlorotetrafluoroethane	$C_2Cl_2F_4$	4	Freon 114
Diethyl ether	$C_4H_{10}O$	3	Ethyl ether, ethoxyethane
Diethyl ketone	$C_5H_{10}O$	4	
Diethylamine	$C_4H_{11}N$	2	Diethamine, ethylethanamine

Compound	Molecular formula	Capacity index	Synonyms
Diisopropyl ether	$C_6H_{14}O$	4	Isopropyl ether, diisopropyl oxide, 2-isopropoxypropane
Dimethyl sulfate	$C_2H_6SO_4$	4	Dimethyl ester of sulfuric acid, methyl sulfate
Dimethylaniline	$C_8H_{11}N$	4	Xylidine
Dioxane	$C_4H_8O_2$	4	Diethylene dioxide, diethylene ether
Ethane	C_2H_6	1	
Ethanol	C_2H_6O	4	Ethyl alcohol
Ethyl acetate	$C_4H_8O_2$	4	Acetic acid ethyl ester, acetic ester, acetic ether, ethyl ethanoate
Ethyl acrylate	C_5H_8O	4	Ethyl propenoate, ethyl ester of acrylic acid
Ethyl bromide	C_2H_5Br	4	Bromoethane, monobromoethane
Ethyl chloride	C_2H_5Cl	3	Chloroethane, hydrochloric ether
Ethyl formate	$C_3H_6O_2$	3	Ethyl methanoate, formic acid ethyl ester, formic ether
Ethyl mercaptan	C_2H_6S	3	Ethanethiol, ethyl sulfhydrate, mercaptoethane
Ethylbenzene	C_8H_{10}	4	Ethylbenzol
Ethylene	C_2H_4	1	Ethene
Ethylene oxide	C_2H_4O	3	Oxirane, epoxyethane
Formaldehyde	CH_2O	2	
Formic acid	CH_2O_2	2	
Freons		2	
Heptane	C_7H_{16}	4	N-Heptane, isoheptane, dimethylpentane
Heptene	C_7H_{14}	4	
Hexane	C_6H_{14}	3	N-Hexane
Hexene	C_6H_{12}	2	Butyl ethylene
Hydrogen	H_2	1	
Hydrogen bromide	HBr	2	
Hydrogen chloride	HCl	1	
Hydrogen fluoride	HF	1	
Hydrogen iodide	HI	2	
Hydrogen selenide	H_2Se	1	
Hydrogen sulfide	H_2S	1	
Indole	C_8H_7N	4	Benzopyrrole, ketole, benzazole
Iodine	I_2	4	
Iodoform	CHI_3	4	
Isoprene	C_5H_8	2	2-Methyl-1,3-butadiene
Lactic acid	$C_3H_6O_3$	4	
Mercaptan	R-SH	4	
Mercury vapours		1	
Mesityloxide	$C_6H_{10}O$	4	4-Methyl-3-penten-2-one, isopropylidene acetone, dimethylvinyl methyl ketone
Methane	CH_4	1	
Methanol	CH_4O	3	Methyl alcohol
Methyl acetate	$C_3H_6O_2$	3	Acetic acid, methylester, methyl ethanoate
Methyl acrylate	$C_4H_6O_2$	4	Methyl propenoate, propenoic acid ester
Methyl bromide	CH_3Br	3	Monobromomethane, bromomethane
Methyl butyl ketone	$C_6H_{12}O$	4	Hexanone, methyl butyl ketone, propylacetone
Methyl chloride	CH_3Cl	3	Monochloromethane, chloromethane
Methyl ethyl ketone	C_4H_8O	4	Ethyl methyl ketone, butanone, methylacetone, MEK
Methylcyclohexane	C_7H_{14}	4	Cyclohexylmethane, hexahydrotoluene, toluene hexahydride
Methylcyclohexanol	$C_7H_{14}O$	4	Hexahydromethylphenol, hexahydrocresol
Methylcyclohexanone	$C_7H_{14}O$	4	

Compound	Molecular formula	Capacity index	Synonyms
Methylene chloride	CH_2Cl_2	4	Dichloromethane, methylene dichloride
Methylether		3	
Methylisobutylketone	$C_6H_{12}O$	4	4-Methyl-2-pentanon, hexone, isopropylketone
Methylmercaptan	CH_4S	4	Thiomethane, mesh
Naphthalene	$C_{10}H_8$	4	Naphtalin, naphthene, tar camphor
Nicotine	$C_{10}H_{14}N_2$	4	(S)-3-[1-Methylpyrrolidin-2-y]pyridine
Nitric acid	HNO_3	2	Hydrogen nitrate
Nitrobenzene	$C_6H_5NO_2$	4	Nitrobenzol, oil of mirbane
Nitroethane	$C_2H_5NO_2$	4	
Nitrogen dioxide	NO_2	1	
Nitroglycerine	$C_3H_5N_3O_9$	4	Glyceryl trinitrate, propantriol-trinitrate, trinitroglycerine
Nitromethane	CH_3NO_2	4	Nitrocarbol
Nitropropane	$C_3H_7NO_2$	4	
Nitrotoluene	$C_7H_7NO_2$	4	Methylnitrobenzene
Nonane	C_9H_{20}	4	Nonyl hydride
Octane	C_8H_{18}	4	
Octene	C_8H_{16}	4	
Ozone	O_3	4	Triatomic oxygen
Palmitic acid	$C_{16}H_{32}O_2$	4	Hexadecanoic acid, hexadecylic acid, cetylic acid
P-Dichloro-benzene	$C_6H_4Cl_2$	4	P-DCB, dichloroxide
Pentane	C_5H_{12}	3	
Pentanoic acid	$C_5H_{10}O_2$	4	Propylacetic acid, butanecarboxylic acid
Pentanone	$C_5H_{10}O$	4	Ethyl acetone, methyl propyl ketone
Pentene	C_5H_{10}	2	Propylethylene
Pentin	C_6H_{10}	2	Butylacetylene
Phenol	C_6H_5OH	4	Carbolic acid, hydroxybenzene, phenyl alcohol
Phosgene	CCl_2O	3	Carbon oxychloride, carbonyl chloride
Propadiene	C_3H_4	1	Dimethylenemethane, dimethylenecarbon
Propanol	C_3H_8O	4	Isopropyl alcohol, IPA, hydroxypropane, isopropane
Propene	C_3H_6	2	Methylethene, propylene
Propionaldehyde	C_3H_6O	2	Methylacetaldehyde, propanal, propionic aldehyde
Propionic acid	$C_3H_6O_2$	4	Carboxyethane, ethanecarboxylic acid, ethylformic acid
Propyl acetate	$C_5H_{10}O_2$	4	
Propyl chloride	C_3H_7Cl	4	Chlorodimethylmethane
Propyl mercaptan	C_3H_8S	1	Propylthiol, propanethiol
Propylether	$C_6H_{14}O$	4	
Prussic acid	HCN	2	Hydrocyanic acid, hydrogen cyanide
Pyridine	C_5H_5N	1	Azabenzene, azine
Silicon-ethyl compounds		4	
Skatole	C_9H_9N	4	3-Methylindole
Styrene	C_8H_8	3	Ethyl benzene, phenylethylene, vinyl benzene, styrol
Sulfur dioxide	SO_2	1	Sulfurous anhydride, sulfur oxide
Sulfur trioxide	SO_3	2	Sulfuric anhydride
Sulfuric acid	H_2SO_4	4	Oil of vitriol
Tetrachloroethane	$C_2H_2Cl_4$	4	
Tetrachloroethylene	C_2Cl_4	4	Perchloroethylene
Tetrachloromethane	CCL_4	4	Carbon tetrachloride
Toluene	C_7H_8	4	Methyl benzene, methyl benzol, phenyl methane, toluol
Trans-2-butenal	C_4H_6O	2	Crotonaldehyde
Trichloroethane	$C_2H_3Cl_3$	4	Ethane trichloride, vinyl trichloride

Compound	Molecular formula	Capacity index	Synonyms
Trichloroethylene	C_2HCl_3	4	Ethylene trichloride, trichloroethene, trilene
Urea	CH_4N_2O	4	Carbamide, carbonyldiamide
Uric acid	$C_5H_4N_4O_3$	4	Lithic acid, trihydroxypurine
Valeral	$C_5H_{10}O$	2	Valeric aldehyde, amyl aldehyde, pentanal
Xylene	C_8H_{10}	1	

ADSORPTION OF ODOURS

In addition, active carbon removes many smells and odours such as:

- Adhesives, paint, plastic and solvent vapours
- Antiseptic vapours, anesthetic gases, disinfectants and other smells in medical settings
- Animal odours, poultry smells
- Body smells, decaying odours, burned flesh
- Cooking, burned food, burned fat and other kitchen odours
- Exhaust gases, combustion, diesel smells
- Mould smells
- Tobacco smoke odour

The capacity index for these odours is generally good, between 3 and 4.*

* Note: Odours are often complex mixtures of substances and their composition may vary. Therefore the exact capacity indexes are not given here.