

Absorption of activated charcoal as well as the capacity index

Capacity index (noncommittal data):

4 = good adsorption

Activated charcoal takes up between 20 and 50% of its dead weight in gaseous materials. Average separating ability for gaseous materials in this category is with approx.. 35% of the dead weight of the coal. This category contains most smell-forming substances.

3 = satisfactory adsorption

Activated charcoal 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 activated charcoal.

2= Poor adsorption

Poor performance on materials which are not readily absorbed and the use is not recommended

1 = No adsorption

The adsorption lies so low that activated charcoal cannot be used effectively against the chemical compound concerned.

Absorption of activated charcoal in relation to chemical single compounds

Substance	Molecular formula	Index	Synonyms						
1-Pentanol	$H_3(CH_2)_3CH_2OH$	4							
2-Chloro-1,3-Butadiene	C_4H_5Cl	4							
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	Ethanoic Anhydride			
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	2-Propanoic Acid				
Acrylonitrile	C_3H_3N	4	Acrylonitrile Monomer	Cyanoethylene	Propenenitrile	Vinyl Cyanide			

Absorption of activated charcoal in relation to chemical single compounds

Substance	Molecular formula	Index	Synonyms							
Amine		1								
Ammonia	NH ₃	1	Anhydrous Ammonia							
Amyl Ether	C ₁₀ H ₂₂ O	4	Pentyl Ether	Amyl Oxide	Diamy Ether					
Aniline	C ₆ H ₇ N	4	Aminobenzene	Aniline Oil	Benzenamine	Phenylamine				
Benzene	C ₆ H ₆	4	Benzol	Phenyl Hydride						
Bromine	Br ₂	4								
Butadiene	C ₄ H ₆	3	Biethylene	Bivinyll	Divinyll	Erythrene	Vinylethylene			
Butanal	C ₄ H ₈ O	1								
Butane	C ₄ H ₁₀	2	Butyl Hydride	Diethyl	Methylethylmethane					
Butane	C ₄ H ₁₀	2								
Butanoic Acid	C ₄ H ₈ O ₂	4	Butyric Acid							
Butanone	C ₄ H ₈ O	4	Ethyl Methyl Ketone	Mek	Methyl Acetone	Methyl Ethyl Ketone				
Butyl Acetate	C ₄ H ₁₂ O ₂	4	Buthyl Ethanoate							
Butyl Alcohol	C ₄ H ₁₀ O	4	Butanol							
Butyl Chloride	C ₄ H ₉ Cl	4								
Butyl Ether	C ₄ H ₉ O	4								
Butyl Ethyl Ketone	C ₇ H ₁₄ O	4	Butyl Ethyl Ketone	3-Heptanone	Heptan-3-One	N-Butyl Ethyl Ketone	Ethyl N-Butyl Ketone	Ebk		
Camphor	C ₁₀ H ₁₆ O	4	2-Camphonone							
Caprylic Acid	C ₈ H ₁₆ O ₂	4	Octanoic	Octylic Acid	Octoic Acid					
Carbon Dioxide	CO ₂	1	Carbon Acid Gas	Dry Ice						
Carbon Disulfide	CS ₂	4	Carbon Bisulfide							
Carbon Monoxide	CO	1	Carbon Oxide	Monoxide						
Chlorine	Cl ₂	2								
Chlorobenzene	C ₆ H ₅ Cl	4	Benzene Chloride	Chlorobenzol	Mcb	Monochlorobenzene	Phenyl Chloride			
Chlorobenzene	C ₆ H ₅ Cl	4								
Chloroethylene	C ₂ H ₃ Cl	3	Vinyl Chloride	Chloro Ethene	Ethylene Monochloride	Monochloroethene	Monochloroethylene			
Chloroform	CHCl ₃	4	Methan Trichloride	Trichloromethane						
Creatine	C ₄ H ₉ O ₂ N ₃	4	Hydroxytoluene							

Absorption of activated charcoal in relation to chemical single compounds

Substance	Molecular formula	Index	Synonyms							
Cresol	C ₇ H ₈ O	4	Kresol							
Cyclohexane	C ₆ H ₁₂	4	Benzene Hexahydride	Hexahydrobenzene	Hexamethylene	Hexanaphthene				
Cyclohexanol	C ₆ H ₁₂ O	4	Anol	Cyclohexyl Alcohol	Hexahydrophenol	Hexalin	Hydralin	Hydroxycyclohexane		
Cyclohexene	C ₆ H ₁₀	4	Benzene Tetrahydride	Tetrahydrobenzene						
Decane	C ₁₀ H ₂₂	4	N-Decane	Decyl Hydride						
Dibromomethane	CH ₂ Br ₂	4	Methylene Bromide	Methylene Dibromide						
Dichlorobenzene	C ₆ H ₄ Cl ₂	4	Dcb							
Dichlorodifluoro methane	CCl ₂ F ₂	4	Difluorodichloro methane	Fluorocarbon 12	Freon	Halon 122	Genetron 12	Refrigerant 12		
Dichloroethane	C ₂ H ₄ Cl ₂	4								
Dichloroethyl Ether	C ₄ H ₈ Cl ₂ O	4	Bis(2- Chloroethyl)Eth er	2,2'-Dichlorodiethyl Ether	2,2'-Dichloroethyl Ether					
Dichloroethylene	C ₂ H ₂ Cl ₂	4	Acetylene Dichloride							
Dichlorofluoro- methane	CHCl ₂ F	3	Dichloromonofl uoromethane	Fluorodichloromethane	Freon 21	Genetron 21	Halon 112	Refrigerant 21		
Dichloronitro- ethane	C ₂ H ₃ O ₂ NCl ₂	4	1,1-Dichloro-1- Nitroethane							
Dichloropropane	C ₃ H ₆ Cl ₂	4	Propylene Dichloride	Dichloro--1,2-Propane	1,2-Dichloropropane					
Dichlorotetra- fluoroethane	C ₂ Cl ₂ F ₄	4	Fc-114	1,2- Dichlorotetrafluoroethan e	Fluorocarbon 114	Freon 114	Refrigerant 114	Halon 242	Cryofluorane	
Diethyl Ether	C ₄ H ₁₀ O	3	Ether	Ethyl Ether	Ethoxyethane	1,1'-Oxybis Ethane,				
Diethyl Ketone	C ₅ H ₁₀ O	4	Dimethylacetone	Ethyl Ketone	Metacetone	3-Pentanone	Propione			
Diethyl Ketone	C ₅ H ₁₀ O	4								
Diethylamine	C ₄ H ₁₁ N	2	Diethamine	N,N-Diethylamine	N-Ethylethanamine					
Diisopropyl Ether	C ₆ H ₁₄ O	4	Isopropyl Ether	Diisopropyl Oxide	2-Isopropoxypropane					
Dimethyl Sulfate	C ₂ H ₆ SO ₄	4	Dimethyl Ester Of Sulfuric Acid	Dimethyl Sulfate	Methyl Sulfate					
Dimethylaniline	C ₈ H ₁₁ N	4	Xylidine							
Dioxane	C ₄ H ₈ O ₂	4	Diethylene Dioxide	Diethylene Ether						
Ethane	C ₂ H ₆	1								
Ethanol	C ₂ H ₆ O	4	Ethyl Alcohol	Ethylol						
Ethyl Acetate	C ₄ H ₈ O ₂	4	Acetic Acid Ethyl Ester	Acetic Ester	Acetic Ether	Ethyl Ethanoate				

Absorption of activated charcoal in relation to chemical single compounds

Substance	Molecular formula	Index	Synonyms							
Nitroglycerine	C ₃ H ₅ N ₃ O ₉	4	Glyceryl - Trinitrate	1,2,3-Propantriol - Trinitrate	Trinitroglycerine					
Nitromethane	CH ₃ NO ₂	4	Nitrocarbol							
Nitropropane	C ₃ H ₇ NO ₂	4								
Nitrotoluene	C ₇ H ₇ NO ₂	4	Methylnitro - benzene							
Nonane	C ₉ H ₂₀	4	Nonyl Hydride							
Octane	C ₈ H ₁₈	4								
Octene	C ₈ H ₁₆	4								
Ozone	O ₃	4	Triatomic Oxygen							
Palmitic Acid	C ₁₆ H ₃₂ O ₂	4	Hexadecanoic Acid	Hexadecylic Acid	Cetylic Acid	1-Pentadecanecarboxylic Acid				
P-Dichloro-benzene	C ₆ H ₄ Cl ₂	4	P-DCB	1,4-Dichlorobenzene	Dichloroxide					
Pentane	C ₅ H ₁₂	3								
Pentanoic Acid	C ₅ H ₁₀ O ₂	4	Propylacetic Acid	1-Butanecarboxylic Acid						
Pentanone	C ₅ H ₁₀ O	4	Ethyl Acetone	Methyl Propyl Ketone	Mpk					
Pentene	C ₅ H ₁₀	2	Propylethylene							
Pentin	C ₆ H ₁₀	2	Butylacetylene							
Phenol	C ₆ H ₅ OH	4	Carbolic Acid	Hydroxybenzene	Monohydroxybenzene	Phenyl Alcohol				
Phosgene	CCl ₂ O	3	Carbon Oxychloride	Carbonyl Chloride	Carbonyl Dichloride	Chloroformyl Chloride				
Propadiene	C ₃ H ₄	1	Dimethylen-methane	Allene						
Propanol	C ₃ H ₈ O	4	Isopropyl alcohol	IPA,	2-hydroxypropane	iso-propanol				
Propene	C ₃ H ₆	2	Methylethene	Propylene						
Propionaldehyde	C ₃ H ₆ O	2	Methylacet - aldehyde	Propanal	Propionic Aldeyde	Propyl Aldeyde				
Propionic Acid	C ₃ H ₆ O ₂	4	Carboxyethane	Ethanecarboxylic Acid	Ethylformic Acid	Metacetic Acid	Methyl Acetic Acid	Propanoic Acid		
Propyl Acetate	C ₅ H ₁₀ O ₂	4								
Propyl Chloride	C ₃ H ₇ Cl	4	Chlorodimethyl-methane							
Propyl Meraptan	C ₃ H ₆ S	1								
Propylether	C ₆ H ₁₄ O	4								
Prussic Acid	HCN	2		Hydrocyanic Acid	Hydrogen Cyanide					

Absorption of activated charcoal in relation to smells

Odour	Index	Odour	Index	Odour	Index	Odour	Index
Adhesive vapour	4	Decaying smells	4	Kerosene	4	Purification plant smells	4
Agressive smells	2	Deodorants	4	Kitchen smells	4	Rancid oil	4
Alcohol smells	4	Detergentien	4	Lacquer steams	4	Resins	4
Animal smell	4	Diesel	4	Laundry smell	4	Rubber	4
Asphalt (tar) smells	4	Disinfectant	4	Lubricant,oils and greases	4	Slaughterhouse smells	3
Bathroom smells	4	domestic animal smells	4	Lysol	4	Smoke	3
Bleaching solutions	2	Eukalyptus	4	Medical smells	4	Solvent smells	3
Body smells	4	Exhaust gas	3	Melons	4	Sour milk	4
Burn smells	3	Fertilizer	4	Menthol	4	Spoiled food	4
Burnt grease	4	Fish smells	3	Mould smells	4	Tar	4
Burnt meal	4	Food smells	4	Onions	4	Toilet smells	4
Burnt meat	4	Fruit storage	4	Organic chemicals	4	Turpentine	4
Cheese smells	4	fuels (liquid)	4	Perspiration smells	4	Vinegar	4
Cigarette smoke	4	Garlic	4	Pesticides	4	Waste smells	4
Citrus fruits	4	Gasoline	4	Photographic chemical smells	4		
Cleaning agent	4	Hospital smells	4	Plastic smells	4		
Coal smoke	3	Industrial wastes	3	Poisonous gases	3		
Color smells	4	Inorganic compounds	4	Popcorn smells	4		
Decay smell	4	Irritants	4	Poultry smell	4		

All data without guarantee

Filter life expectancy example.

A customer uses propanol (Isopropyl Alcohol) for a manual cleaning application. His consumption is approximately 50 grams per week. Propanol has a capacity index of "4" (between 20 to 50%) or approximately 35% by weight.

Carbon consumption = $50g / .35 = 143$ grams. With a filter capacity of 2.05Kg as with the BVX200 filtration systems, the filter will last $2050 / 143 = 14.33$ weeks.

Carbon weight for all OKI gas filters are as follows.

FG-BVX = 500 grams

FG-BVX200 = 2050 grams

FIL22G010 and FIL22G020 = 11,000 grams.

Tips for good gas extraction

Dwell time, also known as "residence time", is the length of time it takes for air to pass through a gas filter element. Longer dwell times generally result in greater gas adsorption as the air remains in contact with carbon for a longer period, so the deeper the carbon filter, the better the extraction will be.

Disposal of Filters saturated with Solvents (Activated Carbon)

If the activated carbon filters are saturated with flammable vapors such as isopropyl alcohol, they have to be disposed of as **hazardous** waste by incineration. A lab test for the flash point is recommended.

Disclaimer:

The information provided is a guideline only. We do advise that you contact your local authority to obtain further information and other applicable regulations.

NOTE: The tables within this document list the relative effectiveness of activated carbon on various materials. The listing does not imply that the construction materials for OK International filters and systems are impervious to all of the compounds shown.

The life expectancy of any purification system is dependent on the concentration of the contaminants to which the system is exposed. Obviously, the consumption rate or life of the media will be shorter as the concentration of the gaseous contaminant increases. Also, be aware that in most real world cases there is no air stream with just one contaminant, but in almost always is accompanied by other gases. This must always be taken into consideration.
