



## Chemical Filtration Guide - CAUTION!

**This guide is not an approved list of chemicals. It is for reference only and may contain outdated or inaccurate information. It is to be used for supporting documentation to determine safe use of Air Science ductless fume hoods by your employer and chemical hygiene officer for your application.**

This list is fully protected by copyright and no part of it may be reproduced in any forms or by any means – graphic, electronic, or mechanical including photocopying, recording, or taping – without the written permission of Air Science®. This resource is meant as a guide only. This guide is not an approved list of chemicals. Always refer to the most current edition of “Threshold Limit Values for Chemicals Substances and Physical Agents and Biological Exposure Indices” before using this chemical listing.\*

Ductless fume hoods provide operator protection. Use of hazardous materials in these cabinets must be monitored by a qualified safety officer. Ductless fume hoods are not intended for use with explosive, flammable or radiological materials unless approved by a qualified chemical safety officer following risk evaluation ensuring that the chemical is safe to handle at all operating conditions. Variables in concentration, temperatures, phases and reactions with other chemicals contribute to uncertainty. You and your onsite chemical safety officer are responsible for determining the appropriate chemicals and quantities, ductless fume hoods and filters to ensure personnel safety. Thorough

analysis by your trained chemical safety officer must be performed for each application. Contact Air Science at [info@airscience.com](mailto:info@airscience.com) or 800.306.0656 for questions about individual applications.

DUCTLESS FUME HOODS WILL NOT PROTECT AGAINST ALL CHEMICALS IN THE WORKPLACE. YOU AND YOUR EMPLOYER MUST ESTABLISH A FORMAL CHEMICAL HYGIENE PROGRAM WHEN AIR SCIENCE DUCTLESS FUME HOODS ARE USED WITH HAZARDOUS CHEMICALS. THE PROGRAM SHOULD INCLUDE EDUCATION, TRAINING AND MAINTENANCE TO ENSURE THE SAFE AND PROPER APPLICATION, USE AND PERFORMANCE OF THE EQUIPMENT. APPROPRIATE PERSONAL PROTECTIVE CLOTHING, INCLUDING GLOVES AND EYEWEAR, ALONG WITH PROPER HANDLING OF CHEMICALS AND HAZARDOUS MATERIALS IN THE ENCLOSURE OR FUME HOOD ARE THE RESPONSIBILITY OF YOU AND YOUR EMPLOYER. AIR SCIENCE DUCTLESS FUME HOODS SHOULD ONLY BE USED BY PERSONNEL WHO HAVE FULLY REVIEWED THE EQUIPMENT OPERATING MANUAL AND UNDERSTAND ALL SPECIFIED LIMITATIONS AND WARNINGS. FAILURE TO FOLLOW THESE WARNINGS MAY RESULT IN ILLNESS OR DEATH.

This chemical list is developed as a guideline to assist in the safe use and operation of a ductless fume hood and is not an approved list of chemicals. This guide is designed as a reference to provide chemical specific data to aid in determining the suitability of ductless filtration for your application. It is intended to assist in the control of health hazards and should only be interpreted and applied by a person trained in an industrial hygiene discipline. It provides a philosophical and practical basis for the uses and limitations of carbon filters. This guide should only be used as supporting reference in the determination of the safe use of a chemical with a carbon-filtered Air Science ductless fume hood.

The data in this guide was gathered from the best available sources including information from carbon suppliers, results from in-house and external testing under dynamic conditions, theoretical extrapolation from available data and extensive engineering judgment. Actual values achieved will vary depending on environmental and operational conditions. All information is believed to be accurate as of printing date, however it may contain inaccurate or outdated information. Any exposure limits listed are for reference only. You should consult the latest regulatory limits applicable to your company, location or industry. We are not responsible for typographical errors. It is the responsibility of the user to contact us for the most current data. Additional data displayed in this guide was also provided from chemicals listed in the National Institute for Occupational Safety and Health (NIOSH) Pocket Guide to Chemical Hazards as well as the OSHA General Industry Air Contaminants Standard.

## How to Use this Guide

### Introduction

Air Science Ductless Fume Hoods are a viable alternative to conventional fume hoods that provide protection from toxic fumes to both laboratory personnel and the environment.

Unlike conventional fume hoods, these cabinets filter out chemical fumes and recycle air directly back to the laboratory, providing energy savings, personnel and environmental protection. As there is no need for complicated ducting systems, ductless fume hoods are more convenient and more mobile.

You might have concerns over which filters to choose for specific chemicals, as there are hundreds of different types of activated carbon in the world and each is made for different specific applications. Air Science has developed this Chemical Reference List to simplify the decision making process. This Chemical Reference List, combined with our Application Assessment Form, will ensure that you are using the right filter for your application.

### How to use the Chemical Reference List

#### Step 1

Identify the chemicals most commonly used for your applications. The chemicals are listed in alphabetical order.

#### Step 2

For each chemical, follow the row across for:

- Substance Characteristics
- Recommended Filter Selection

## Filter Configurations

### Filters can be ordered in the following configurations:

Single	One type of activated carbon.
Blended	A single filter with two or more types of carbon blended throughout.
Layered	A single filter with two or more types of carbon in separate layers.
Stacked	Some units allow for two or more single filters each with a different type of carbon.

### Definitions

- **ppm** – parts of vapor or gas per million parts of contaminated air by volume
- **mg/m<sup>3</sup>** – milligrams of substance per cubic meter of air
- **f/cc** – fibers per cubic centimeter fibers per cubic centimeter

### Substance Characteristics Definitions

- **MW** – Molecular Weight
- **Bp** – Boiling Point
- **Mp** – Melting Point
- **SG** – Specific Gravity

### Filter Recommendation System

- **x** – Suitable for the primary carbon filter if installed and monitored properly, according to manufacturer specifications.
- **NR** – Not suitable for ductless fume hood use. Call Air Science to discuss options for this type of chemical containment / protection.
- **Please call to discuss** – This application can be suitable in certain instances but needs a thorough review to ensure all safety precautions are followed.

## Carbon Filtration Introduction

Fume hoods provide protection from fumes and vapors that are created by processes in the biotechnology, life sciences, forensic and pharmaceutical industries. Fume hoods can be ducted into an existing HVAC system or can be ductless.

Ductless filtration systems provide highly efficient, sustainable protection in portable, standalone equipment that can fit in nearly any laboratory. The purpose of this application guide is to provide information on the proper use of the ductless fume hood.

In addition to energy efficiency, capital investment savings and customizable filtration, ductless hoods can be designed for equivalent or safer performance than ducted hoods.

There are, however, limitations to ductless technology and possible safety consequences from the misuse of ductless fume hoods. It is important to know recommended guidelines for ductless fume hoods and appropriate carbon filtration.

### Ductless vs. Ducted

Laboratory ventilation should be examined from an overall perspective to achieve the proper balance in terms of protection and cost. The table below summarizes the pros and cons of ducted versus ductless fume hoods.

**Table 1 - Hood Type Comparison**

Ductless Fume Hood	Conventional (Vented) Fume Hood
Handles limited quantity of chemicals	Handles unlimited chemical quantity
Handles limited types of chemicals	Handles larger number of chemicals
Proper filters need to be used	Does not utilize filters
Filters need to be closely monitored	Does not utilize filters
No installation cost or ductwork	Expensive installation and ductwork
Flexibility in location of fume hood, can be placed at point of actual use	Generally located on outside wall and difficult to move for relocation
No loss of conditioned air	Extensive make-up air required
Fumes captured within filter and oxidized or neutralized	Pollutants released to atmosphere in uncontrolled fashion

The conventional ducted fume hood is important for handling large quantities or difficult to handle chemicals. Ductless fume hoods, however, provide point of use protection at minimal costs without releasing dangerous toxins into the atmosphere. On the other hand, ductless fume hoods are limited in terms of the chemicals, and the quantities of those chemicals, they can handle.

## Use of the Guide

The use of activated carbon filters in ductless mode is dependent on the chemicals being used and the quantity of chemical being evaporated into the filter. Generally speaking, chemicals with a molecular weight over 30 and a boiling point higher than 60°C (140°F) are candidates for adsorption with carbon filters. Yet there are exceptions and combinations which need to be evaluated by your supplier.

Carbon filters have pre-determined retention capacities. Your supplier should be able to predict the amount of chemical in grams or milliliters that is capable of being retained by the filter, prior to any measurable desorption taking place. This is done by using data from the carbon supplier, testing under dynamic conditions, extrapolation from available data and engineering judgement. The attached chemical listing is an example of how this can be done to provide the user with necessary information to ensure the safe use of a ductless fume hood equipped with activated carbon filters.

**Note:** When working with multiple chemicals and mixtures where the filter retention capacities are not additive, but conversely could significantly reduce filter retention capacity, a weighted average should be calculated. Typically, the chemical with the lowest molecular weight or lowest capacity would be released from the filter bed first.

## Filtration Technology

The main principle on which the filtration of gas molecules is based is the concept of adsorption. Two main processes by which adsorption takes place are physical adsorption and chemisorption. Physical adsorption is non-specific; adsorption of the gas molecule is by diffusion (Brownian Movement) or adsorption/condensation using Van der Waal forces. The gas molecules move into an empty area and diffuse into the pore. Attracted and captured in the space by the Van der Waal force, the molecules penetrate into the pores, impact the walls and are trapped. The number of pores present in the carbon is vast and therefore the total surface area is extremely large.

The physical process of adsorption is followed by chemical adsorption (chemisorption). This is a chemical reaction in which the two substances react together and the resultant chemical is trapped on the filter material. The impregnation of filter media can greatly extend the range of gases that can be removed from the air. In all, over a dozen different filter impregnations are used on the filters included in our chemical listing (see Filter Summary table).

## Factors That Affect Adsorption Efficiency

The ability of a filter to function efficiently is dependent on a number of factors including: temperature, humidity, residence time, age of filter, evaporation rate and concentration.

### Temperature

The temperature of the gas is very important. The higher the temperature, the lower the adsorption capacity, especially for a gas with a low boiling point. As a general rule temperature must be kept below 40°C (104°F). **Never heat / boil in hood.**

### Humidity

Relative humidity is also an important factor that can affect the efficiency of the filter. The molecules of gases with low boiling points will be less readily adsorbed because the molecules of the water vapor will be adsorbed in their place, leaving less free surface in the pores for the gas molecules to impact the carbon. As a general rule, the relative humidity must always be kept below 60%.

### Residence Time

Residence time is the time needed by the air to cross the filter, during which it stays in contact with the carbon itself. This is the time during which the molecules of gas can be adsorbed by the pores of the carbon and should be as long as possible. To maximize residence time, the thickness of the filter must be sufficient and the air speed crossing it must be kept to a minimum. This minimum is influenced by the fact that the air speed across the front opening of the fume hood (face velocity) must be kept at a rate sufficient to insure containment of the fumes within the enclosure.

### Filter Age, Evaporation Rate and Concentration

Carbon filters, if not properly stored before use, become less efficient with time. Additionally, the rate at which the chemical is being evaporated and the concentration of chemical vapors within the enclosure will likewise impact efficiency with the higher evaporation and concentration having a negative impact on efficiency.

## Multiplex™ Filtration System

The Air Science Multiplex™ Filtration System consists of a pre-filter, main filter and optional safety filter to create a combination of chemical and physical architecture customized to each application. The mechanical design enhances safety, convenience and overall value. The electrostatic pre-filter is accessible from within the cabinet. A filter clamping mechanism allows for the filter to be easily installed and ensures an even seal at the filter peripheral face at all times to prevent bypass leakage.

The Air Science carbon filtration technique is based on enhanced, activated carbon particle formulations from specially selected, naturally occurring raw materials superior to wood or other organic sources. The carbon is treated to attain the proper porosity and aggregate surface area and to react with several ranges of aerosolized chemicals moved through the filter by an air handling blower. The multiplex option permits combining one or more filtration choices to meet a wider range of multiple-use applications.

Multiplexing permits configuration for the capture of acids, bases and particulates, such as biological aerosols when paired with HEPA or ULPA filters. The Air Science carbon filter is a self-contained assembly that is sized to fit the specified product model number. It is configured to optimize airflow across 100% of the filter surface area for maximum efficiency, prolonged filter life and optimal diffusion, saturation capacity and user safety. Air Science is the single source supplier for all pre-filters and carbon filters used in its products.

### Filter Summary (other formulas may be available)

Formula	Description
GP Plus!	The most widely used filter in the range, primarily for solvent, organic and alcohol removal
ACI Plus!/SUL	Designed to neutralize volatile inorganic acid vapors
ACR	Iodine and methyl iodide vapors; It is frequently used for iodination reactions with lower level radioactive iodine
ACM	Mercury vapor
AMM	Removes vapors from dilute ammonia solutions and to remove low molecular weight amines
FOR	Designed to oxidize formaldehyde and glutaraldehyde fumes; It is widely used in hospital pathology laboratories
HEPA/UPLA	Powders and particulates

### Multiplex Filtration System, Summary

	Filter Type	Filter Function
<b>Standard Filters</b>		
<b>Pre-Filter</b>	Electrostatic	Protects the main filter from aerosols, mists, dust and particulates. Pre-filter efficiency is typically 95.5% or greater down to 0.5 microns.
<b>Main Filter</b>	HEPA (ULPA optional)	A self-contained HEPA filter physically captures larger than 0.3 micron particulates. An ULPA filter may be specified to capture particulates larger than 0.12 microns. Specify when ordering.
<b>Main Filter</b>	Activated Carbon	FILTCO™ sourced, the carbon filters contain activated carbon granules chemically formulated to capture one or more specific vapors or family of vapors.
<b>Safety Filters</b>		
<b>Safety Filter (HEPA/ULPA)</b>	HEPA (ULPA optional)	The safety filter can be a self-contained HEPA filter which physically captures larger than 0.3 micron particulates. An ULPA filter may be specified to capture particulates larger than 0.12 microns. Specify when ordering. When chosen, the HEPA/ULPA safety filter permits the cabinet exhaust to be vented to the room without external ducting.
<b>Safety Filter (Carbon)</b>	Activated Carbon	FILTCO™ sourced, the single carbon filter contains activated carbon granules chemically formulated to capture one or more specific vapors or family of vapors. When chosen as the safety filter, the cabinet must be vented to the outside for USP 800 compliance.

### Do's and Don'ts

The recommended filter types are intended as guidelines only and are subject to variations from a number of factors previously discussed. When using a number of different chemicals, the retention capacities are not additive but a weighted average needs to be calculated. Activated carbon filters are not recommended for use where very large quantities of contaminants or highly toxic substances are produced, such as in acid digestions or evaporation of solvents to dryness. The recommended filter is the main single-layer filter to be used for the application. In cases where more than one chemical family is involved it may be possible to use a multi-layered filter. All these cases should be discussed with your supplier to validate the choice of an appropriate filter. Always try to perform applications where the concentration levels are below the exposure limit of the chemicals being handled.

### Minimize risk:

- Work with the smallest amounts of chemicals needed.
- Always work with concentrations below the maximum exposure limit.
- Minimize evaporation by keeping containers closed and sealed.
- Immediately clean up spills with absorbent wipes or towels and dispose of properly.
- Replace filters after accidental major spill or release.

## Revolving Filters

Air Science strongly discourages the unsafe practice of revolving secondary back-up filters into the primary filter compartment. All Air Science units are designed to avoid this false sense of security. In a revolving filter system, users are instructed to rotate the secondary back-up filter into the primary filter position after non-permissible exposure levels of chemicals are detected within the monitoring chamber. Depending on when the unit can be properly shut down, the secondary filter can be loaded to the point of saturation itself, thereby creating a safety hazard if the filter is considered new. If a new spare filter is not immediately available, a user may inadvertently (or knowingly) re-install a contaminated primary filter into the secondary location permitting the system to operate without protection. Additionally, the secondary filter can become contaminated as it ages, sometimes for years, on top of an operational cabinet, losing filter efficiency by the time it is installed. Either practice puts both personnel and the environment at risk, even though some manufacturers provide stickers to label the filters as "used." Always know your filter type, suitable chemicals and installation date; generally speaking, change filters regularly as needed.

## Filter Monitoring

There are two aspects to filter monitoring: checking the airflow to ensure the pre-filter is not clogged with dust and checking the exhaust air for chemical contaminants to ensure the main filter has not reached the breakthrough point. The results of the filter monitoring should be recorded on a dated log sheet. Airflow can be measured with an anemometer using a propeller, hot wire, or vane anemometer.

Monitoring can be performed with gas detection tubes. Most units have test ports allowing the use of this equipment in a zone immediately above the main filter. Back-up filters prevent any contamination coming from the main filter from being recirculated into the work area. A detailed monitoring program is given in the operating manual provided with each unit. An optional electronic filter saturation alarm offers limited detection of low concentrations of hydrocarbon, some gases and organic acids.

Your senses may also be used to notice any odors or irritation resulting from chemicals in use. If any of the above conditions indicate a potential filter breakthrough, immediately replace the filters. Additionally, air exchanges within rooms where ductless fume hoods are located should meet or exceed the exhaust output of the hood. Failure to ensure this condition can lead to an accumulation of chemicals in the event of an unmanned filter breakthrough.

## Safety Standards

Users of ductless fume hoods should acquaint themselves with the safety standards currently applicable within the United States or country of use.

## Filter Monitoring

Refer to ANSI/AIHA Z9.5 with specific reference to section 4.12.4 dealing with activated carbon filters and ANSI/AIHA Z9.7 entitled "Recirculation of Air from Industrial Process and Exhaust Systems." These are available through the American Industrial Hygiene Association, 3141 Fairview Park Drive, Suite 777, Falls Church, VA 22042.

## Fume Hood Performance Testing

Refer to ANSI/ASHRAE 110-1985 entitled "Method of Testing Performance of Laboratory Fume Hoods" Available from the American National Standards Institute Headquarters, 1899 L Street NW, 11th Floor, Washington, DC 20036.

## Requirements for Ventilation Devices

Refer to Code of Federal Regulations, Title 29, Part 1910 entitled "Occupational Exposure to Hazardous Chemicals in Laboratories; Final Rule" OSHA. Available from the U.S. Government Publishing Office, 732 N. Capital Street NW, Washington, DC 20401.

## \*Exposure Limits to Chemical Substances

Refer to most current edition of "Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices" available from the American Conference of Governmental Industrial Hygienists, 3640 Park 42 Drive, Cincinnati, OH 45241.

CHEMICAL REFERENCE LIST		SUBSTANCE CHARACTERISTICS					RECOMMENDED FILTER TYPE							
Substance [CAS No.]	Synonyms	Chemical Formula	Mol. Weight (MW)	Specific Gravity (SG)	Boiling Point (Bp °C)	Melting Point (Mp °C)	GP Plus!	ACI Plus/ SUL	ACR	ACM	AMM	FOR	EDU	HEPA / ULPA
Acetaldehyde [75-07-0]	Acetic aldehyde, Ethanal, Ethyl aldehyde	CH <sub>3</sub> CHO	44	0.790	20	-124						x		
Acetic acid [64-19-7]	2,4,5-Trichlorophenoxyacetic acid	CH <sub>3</sub> CO <sub>2</sub> H	60	1.050	118		x						x	
Acetic anhydride [108-24-7]	Acetic acid anhydride, Acetic oxide, Acetyl oxide, Ethanoic anhydride	(CH <sub>3</sub> CO) <sub>2</sub> O	102	1.080	140		x						x	
Acetone [67-64-1]	Ethyl methyl ketone, MEK, Methyl acetone, Methyl ethyl ketone	C <sub>3</sub> H <sub>6</sub> O	58	0.790	57		x						x	
Acetone cyanohydrin [75-86-5], as CN	Cyanohydrin-2-propanone, 2-Cyano-2-propanol, alpha-Hydroxyisobutyronitrile, 2-Hydroxy-2-methyl-propionitrile, 2-Methylacetonitrile	C <sub>2</sub> H <sub>7</sub> NO	85	0.930	82	-20					Please call to discuss			
Acetonitrile [75-05-8]	Cyanomethane, Ethyl nitrile, Methyl cyanide [Note: Forms cyanide in the body.]	C <sub>2</sub> H <sub>3</sub> N	41	0.780	82									
Acetophenone [98-86-2]	Methyl phenyl ketone, Acetyl benzene, Benzoyl methide, Hypnone, 1-Phenylethanone, acetylbenzene, phenyl methyl ketone, MPK, PMK	C <sub>8</sub> H <sub>8</sub> O	120		202	10					Please call to discuss			
Acetylene [74-86-2]	Acetylene tetrachloride, Symmetrical tetrachloroethane	C <sub>2</sub> H <sub>2</sub>	26	0.001		-84	x						x	
Acetylene tetrabromide [79-27-6]	Symmetrical tetrabromoethane; TBE; Tetrabromoacetylene; Tetrabromoethane; 1,1,2,2-Tetrabromoethane	C <sub>2</sub> H <sub>2</sub> Br <sub>4</sub>	346	2.970	239		x						x	
Acrylamide [79-06-1]	Acrylamide monomer, Acrylic amide, Propenamamide, 2-Propenamamide	C <sub>3</sub> H <sub>5</sub> NO	71	1.120		85								x
Acrylic acid [79-10-7]	Acroleic acid, Aqueous acrylic acid (technical grade is 94%), Ethylenecarboxylic acid, Glacial acrylic acid (98% in aqueous solution), 2-Propenoic acid	C <sub>3</sub> H <sub>4</sub> O <sub>2</sub>	72	1.050	142		x						x	
Acrylonitrile [107-13-1]	Acrylonitrile monomer, AN, Cyanoethylene, Propenenitrile, 2-Propenenitrile, VCN, Vinyl cyanide	C <sub>3</sub> H <sub>3</sub> N	53	0.081	77		x						x	
Adipic acid [124-04-9]		C <sub>6</sub> H <sub>10</sub> O <sub>4</sub>	146		152			x						
Allyl alcohol [107-18-6]	1,4-Dicyanobutane; Hexanedinitrile; Tetramethylene cyanide	C <sub>3</sub> H <sub>6</sub> O	58	0.850	97		x						x	
Allyl chloride [107-05-1]	3-Chloroallyl chloride; DCP; 1,3-Dichloro-1-propene; 1,3-Dichloropropylene; Telone®	C <sub>3</sub> H <sub>5</sub> Cl	77	0.940	45		x	x					x	
Allyl glycidyl ether (AGE) [106-92-3]		C <sub>6</sub> H <sub>10</sub> O <sub>2</sub>	114	0.970	154		x						x	
Allyl propyl disulfide [2179-59-1]	4,5-Dithia-1-octene; Onion oil; 2-Propenyl propyl disulfide; Propyl allyl disulfide	C <sub>6</sub> H <sub>12</sub> S <sub>2</sub>	148	0.930							Please call to discuss			
Aluminum [7429-90-5] Metal dust Pyro powders, as Al Welding fumes, as Al Soluble salts, as Al Alkyls (NOC(d)), as Al	Alumina, Aluminum oxide, Aluminum trioxide [Note: alpha-Alumina is the main component of technical grade alumina. Corundum is natural Al <sub>2</sub> O <sub>3</sub> . Emery is an impure crystalline variety of Al <sub>2</sub> O <sub>3</sub> .]	various	27											x
Aluminium oxide [1344-28-1]		Al <sub>2</sub> O <sub>3</sub>	102											x
2-Aminopyridine [504-29-0]	Alpha-Aminopyridine, alpha-Pyridylamine	C <sub>5</sub> H <sub>6</sub> N <sub>2</sub>	91	211.0							x			
Amitrole [61-82-5]	Aminotriazole; 3-Aminotriazole; 2-Amino-1,3,4-triazole; 3-Amino-1,2,4-triazole	C <sub>2</sub> H <sub>4</sub> N <sub>4</sub>	84	1.140		159					Please call to discuss			
Ammonia [7664-41-7]	Anhydrous ammonia, Aqua ammonia, Aqueous ammonia [Note: Often used in an aqueous solution.]	H <sub>3</sub> N	17	0.001	-33						x		x	
Ammonium chloride fume [12125-02-9]	Ammonium chloride, Ammonium muriate fume, Sal ammoniac fume	ClH <sub>4</sub> N	54											x
n Amyl acetate, see NIC for pentyl acetate (all isomers)	Amyl acetic ester, Amyl acetic ether, 1-Pentanol acetate, Pentyl ester of acetic acid, Primary amyl acetate	C <sub>7</sub> H <sub>14</sub> O <sub>2</sub>	130	0.880	148		x						x	
sec-Amyl acetate, see NIC for pentyl acetate (all isomers)	1-Methylbutyl acetate, 2-Pentanol acetate, 2-Pentyl ester of acetic acid	C <sub>7</sub> H <sub>14</sub> O <sub>2</sub>	130	0.570	123		x						x	
n Amyl Alcohol (71-41-0)	Fermentation amyl alcohol, Fusel oil, Isobutyl carbinol, Isopentyl alcohol, 3-Methyl-1-butanol, Primary isoamyl alcohol	C <sub>5</sub> H <sub>12</sub> O	88		138		x						x	



CHEMICAL REFERENCE LIST		SUBSTANCE CHARACTERISTICS					RECOMMENDED FILTER TYPE							
Substance [CAS No.]	Synonyms	Chemical Formula	Mol. Weight (MW)	Specific Gravity (SG)	Boiling Point (Bp °C)	Melting Point (Mp °C)	GP Plus!	ACI Plus/SUL	ACR	ACM	AMM	FOR	EDU	HEPA / ULPA
Aniline [62-53-3] and homologues	DACPM; 3,3'-Dichloro-4,4'-diaminodiphenylmethane; MBOCA; 4,4'-Methylenebis(o-chloro aniline); 4,4'-Methylenebis(2-chlorobenzeneamine); MOCA	C <sub>6</sub> H <sub>7</sub> N	93	1.020	184		×							
Anisidine [90 04 0]	p-Methoxybenzaldehyde * 4-Methoxybenzaldehyde, p-anisaldehyde	C <sub>7</sub> H <sub>7</sub> NO	123	1.100	225									
Antimony [ 7440-36-0] and compounds, as Sb	para-Aminoanisole, 4-Anisidine, p-Methoxyaniline	Sb	122											×
Arsine [7784-42-1]	Varies depending on compound	AsH <sub>3</sub>	78	0.003	-63						NR			
Asbestos, all forms [1332-21-4]	Arsenic hydride, Arsenic trihydride, Arseniuretted hydrogen, Arsenous hydride, Hydrogen arsenide	CaMg <sub>3</sub> (SiO <sub>3</sub> ) <sub>4</sub>												×
Barium [7440-39-3] and soluble compounds, as Ba	Varies depending on compound	Ba	137		1640									×
Barium sulfate [7727-43-7]	Artificial barite, Barite, Barium salt of sulfuric acid, Barytes (natural)	BaO <sub>3</sub> S	233			1580								×
Benomyl [17804-35-2]	Methyl 1-(butylcarbomoyl)-2-benzimidazolecarbamate	C <sub>14</sub> H <sub>18</sub> N <sub>4</sub> O <sub>3</sub>	290											
Benzene [71-43-2]	Benzol, Phenyl hydride	C <sub>6</sub> H <sub>6</sub>	78	0.880	80		×						×	
Benzidine [92-87-5]	Benzidine-based dyes; 4,4'-Bianiline; 4,4'-Biphenyldiamine; 1,1'-Biphenyl-4,4'-diamine; 4,4'-Diaminobiphenyl; p-Diaminodiphenyl	C <sub>12</sub> H <sub>12</sub> N <sub>2</sub>	184	1.250	402						NR			
Benzyl acetate [140-11-4]		C <sub>9</sub> H <sub>10</sub> O <sub>2</sub>	150		212						NR			
Benzyl chloride [100-44-7]	Chloromethylbenzene, alpha-Chlorotoluene	C <sub>7</sub> H <sub>7</sub> Cl	127	1.100	179		×	×					×	
Biphenyl [92-52-4]	Biphenyl, Phenyl benzene	C <sub>12</sub> H <sub>10</sub>	154	1.040	255									
Bismuth telluride, as Bi <sub>2</sub> Te <sub>3</sub> Undoped [1304-82-1] Se-doped	Bismuth sesquiterelluride, Bismuth telluride, Bismuth tritelluride, Tellurobismuthite	Bi <sub>2</sub> Te <sub>3</sub>	801	7.700		573								×
Borates, tetra, sodium salts [1303-96-4] Anhydrous Decahydrate Pentahydrate	Anhydrous borax, Borax dehydrated, Disodium salt of boric acid, Disodium tetraborate, Fused borax, Sodium borate (anhydrous), Sodium tetraborate	B <sub>4</sub> H <sub>10</sub> Na <sub>2</sub> O <sub>12</sub>	201											×
Boron oxide [1303-86-2]	Boric anhydride, Boric oxide, Boron trioxide	B <sub>2</sub> O <sub>3</sub>	70			5								×
Bromine [7726-95-6]	Molecular bromine	Br <sub>2</sub>	160	3.120	59	0	×		×				×	
Bromine pentafluoride [7789-30-2]	Bromine fluoride	BrF <sub>5</sub>	175	2.480	41						NR			
Bromoform [75-25-2]	Methyl tribromide, Tribromomethane	CHBr <sub>3</sub>	253	2.890	150		×						×	
1,3-Butadiene [106-99-0]	2-Chloro-1,3-butadiene; Chlorobutadiene; Chloroprene	C <sub>4</sub> H <sub>6</sub>	54	0.650	-5						NR			
n Butane [106-97-8]	Normal-Butane, Butyl hydride, Diethyl, Methyl ethylmethane [Note: Also see specific listing for Isobutane.]	C <sub>4</sub> H <sub>10</sub>	58	0.003	-12						NR			
Butanol [71-36-3]	1-Butanol, n-Butanol, Butyl alcohol, 1-Hydroxybutane, n-Propyl carbinol	C <sub>4</sub> H <sub>10</sub> O	74	0.810	118		×						×	
2-Butoxyethanol (EGBE) [111-76-2]	Butyl Cellosolve®, Butyl oxitol, Dowanol® EB, EGBE, Ektasolve EB®, Ethylene glycol monobutyl ether, Jeffersol EB	C <sub>8</sub> H <sub>18</sub> O <sub>2</sub>	118	0.900	171		×						×	
n Butyl acetate [123-86-4]	Butyl acetate, n-Butyl ester of acetic acid, Butyl ethanoate	C <sub>8</sub> H <sub>16</sub> O <sub>2</sub>	116	0.880	127		×						×	
sec Butyl acetate [105-46-4]	sec-Butyl ester of acetic acid, 1-Methylpropyl acetate	C <sub>8</sub> H <sub>16</sub> O <sub>2</sub>	116	0.860			×						×	
tert Butyl acetate [540-88-5]	tert-Butyl ester of acetic acid	C <sub>8</sub> H <sub>16</sub> O <sub>2</sub>	116	0.860			×						×	



CHEMICAL REFERENCE LIST		SUBSTANCE CHARACTERISTICS					RECOMMENDED FILTER TYPE							
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n Butyl acrylate [141-32-2]	n-Butyl acrylate, Butyl ester of acrylic acid, Butyl-2-propenoate	C <sub>7</sub> H <sub>12</sub> O <sub>2</sub>	128	0.890	146		×						×	
n Butyl Chloride (109-69-3)		C <sub>4</sub> H <sub>9</sub> Cl	92		79						NR			
sec Butyl Chloride (78-86-4)		C <sub>4</sub> H <sub>9</sub> Cl	92		68						NR			
n-Butylamine [109-73-9]	1-Aminobutane, Butylamine	C <sub>4</sub> H <sub>11</sub> N	73	0.740	78	5					×		×	
n Butyl glycidyl ether (BGE) [2426-08-6]	BGE; 1,2-Epoxy-3-butoxypropane	C <sub>7</sub> H <sub>14</sub> O <sub>2</sub>	130	0.910	164		×						×	
n Butyl lactate [138-22-7]	Butyl ester of 2-hydroxypropanoic acid, Butyl ester of lactic acid, Butyl lactate	C <sub>7</sub> H <sub>14</sub> O <sub>3</sub>	146	0.980	188		×						×	
n Butyl mercaptan [109-79-5]	Butanethiol, 1-Butanethiol, n-Butanethiol, 1-Mercaptobutane	C <sub>4</sub> H <sub>10</sub> S	90	0.830							NR			
para tert Butylphenol [89-72-5]		C <sub>10</sub> H <sub>14</sub> O	150	0.890	226		×						×	
Butyl toluene [98-51-1]	4-tert-Butyltoluene, 1-Methyl-4-tert-butylbenzene	C <sub>11</sub> H <sub>16</sub>	148	0.860	193		×						×	
Butyric Acid (107-92-6)		C <sub>4</sub> H <sub>8</sub> O <sub>2</sub>	88	163.500			×	×					×	
Cadmium, elemental [7440-43-9], and compounds, as Cd		Cadmium metal: Cadmium	112 (Varies)											×
Calcium carbonate [1317-65-3]	Calcium salt of carbonic acid	CCaO <sub>3</sub>	100											×
Calcium oxide [1305-78-8]	Burned lime, Burnt lime, Lime, Pebble lime, Quick lime, Unslaked lime	CaO	56	3.340	2850									×
Calcium sulfate [7778-18-9]	Anhydrous calcium sulfate, Anhydrous gypsum, Anhydrous sulfate of lime, Calcium salt of sulfuric acid	CaO <sub>4</sub> S	136	2.960		1450								×
Carbofuran [1563-66-2]	2,3-Dihydro-2,2-dimethyl-7-benzofuranyl methylcarbamate; Furacarb®; Furadan®	C <sub>12</sub> H <sub>15</sub> NO <sub>3</sub>	221	1.180		150					Please call to discuss			
Carbon black [1333-86-4]	Acetylene black, Channel black, Furnace black, Lamp black, Thermal black	C	12											×
Carbon dioxide [124-38-9]	Carbonic acid gas, Dry ice	CO <sub>2</sub>	44								NR			
Carbon disulfide [75-15-0]	Carbon bisulfide	CS <sub>2</sub>	76	1.260	46		×						×	
Carbon monoxide [630-08-0]	Carbon oxide, Flue gas, Monoxide	CO	28								NR			
Carbon tetrabromide [558-13-4]	Carbon bromide, Methane tetrabromide, Tetrabromomethane	CBr <sub>4</sub>	332	3.420	190		×						×	
Carbon tetrachloride (Tetrachloromethane) [56-23-5]	Carbon chloride; Carbon tet; Freon® 10; Halon® 104; Tetrachloromethane	CCl <sub>4</sub>	154	1.590	77		×						×	
Carbonyl fluoride [353-50-4]	Carbon difluoride oxide, Carbon fluoride oxide, Carbon oxyfluoride, Carbonyl difluoride, Fluoroformyl fluoride, Fluorophosgene	CF <sub>2</sub> O	66								NR			
Cesium hydroxide [21351-79-1]	Cesium hydrate, Cesium hydroxide dimer	CsOH	150	3.680		272								×
Chlorine [7782-50-5]	Molecular chlorine	Cl <sub>2</sub>	71		-35		×						×	
Chlorine dioxide [10049-04-4]	Chlorine oxide, Chlorine peroxide	ClO <sub>2</sub>	67		10						NR			
Chlorine trifluoride [7790-91-2]	Chlorine fluoride, Chlorotrifluoride	ClF <sub>3</sub>	92		12						NR			
Chloroacetaldehyde [107-20-0]	Chloroacetaldehyde (40% aqueous solution), 2-Chloroacetaldehyde, 2-Chloroethanal	C <sub>2</sub> H <sub>3</sub> ClO	79				×	×					×	
Chloroacetone [78-95-5]		C <sub>3</sub> H <sub>5</sub> ClO	93		119						Please call to discuss			
Chloroacetophenone [532-27-4]	2-Chloroacetophenone; Chloromethyl phenyl ketone; Mace®; Phenacyl chloride; Phenyl chloromethyl ketone; Tear gas	C <sub>8</sub> H <sub>7</sub> ClO	155	1.320	247						NR			
Chloroacetyl chloride [79-04-9]	Chloroacetic acid chloride, Chloroacetic chloride, Monochloroacetyl chloride	C <sub>2</sub> H <sub>2</sub> Cl <sub>2</sub> O	113	1.420	105						NR			

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Chlorobenzene [108-90-7]	Benzene chloride, Chlorobenzol, MCB, Monochlorobenzene, Phenyl chloride	C <sub>6</sub> H <sub>5</sub> Cl	113	1.110	133		×	×					×	
Chlorobenzylidene malononitrile [2698-41-1]		C <sub>10</sub> H <sub>5</sub> ClN <sub>2</sub>	189								NR			
Chlorobromomethane [74-97-5]	Bromochloromethane; CB; CBM; Fluorocarbon 1011; Halon® 1011; Methyl chlorobromide	CH <sub>2</sub> BrCl	129	1.930	68		×	×					×	
Chlorodifluoromethane	Difluorochloromethane; Fluorocarbon-22; Freon® 22; Genetron® 22; Monochlorodifluoromethane; Refrigerant 22	CHClF <sub>2</sub>	86								NR			
Chlorodiphenyl (42% chlorine) [53469-21-9]	Aroclor® 1242, PCB, Polychlorinated biphenyl	PCB C <sub>12</sub> H <sub>6</sub> Cl <sub>2</sub> AND C <sub>12</sub> H <sub>7</sub> Cl <sub>3</sub> AND C <sub>12</sub> H <sub>6</sub> Cl <sub>4</sub>	267								NR			
Chlorodiphenyl (54% chlorine) [11097-69-1]	Aroclor® 1254, PCB, Polychlorinated biphenyl		328								NR			
Chloroform [67-66-3]	Methane trichloride, Trichloromethane	CHCl <sub>3</sub>	119				×						×	
Chloropentafluoroethane [76-15-3]		C <sub>2</sub> ClF <sub>5</sub>	154								NR			
Chloropicrin [76-06-2]	Nitrochloroform, Nitrotrichloromethane, Trichloronitromethane	CCl <sub>3</sub> NO <sub>2</sub>	164								NR			
Chromium, metal [7440-47-3] and inorganic compounds, as Cr Metal and Cr III compounds Water-soluble Cr VI compounds Insoluble Cr VI compounds	Chrome, Chromium	Cr	varies											×
Chromyl chloride [14977-61-8]	Green Powder; Chromium Sesquioxide; Green Chromium	Cl <sub>2</sub> CrO <sub>2</sub>	155								NR			
Clopidol [2971-90-6]	77288; Dichromium trioxide	C <sub>7</sub> H <sub>7</sub> Cl <sub>2</sub> NO	192			320								×
Coal dust	Anthracite coal dust, Bituminous coal dust, Lignite coal dust													×
Cobalt, elemental [7440-48-4], and inorganic compounds, as Co	Cobalt metal dust, Cobalt metal fume	Co	59 (Varies)											×
Cobalt carbonyl [10210-68-1], as Co	Di-mu-Carbonylhexacarbonyl-dicobalt, Cobalt octacarbonyl, Cobalt tetracarbonyl dimer, Dicobalt carbonyl, Dicobalt Octacarbonyl, Octacarbonyldicobalt	C <sub>8</sub> Co <sub>2</sub> O <sub>8,4</sub>	342	1.870	5	-26					NR			
Cobalt hydrocarbonyl [16842-03-8], as Co	Hydrocobalt tetracarbonyl, Tetracarbonylhydridocobalt, Tetracarbonylhydrocobalt	C <sub>4</sub> HCOO <sub>4</sub>	172								NR			
Copper [7440-50-8]	Copper metal dusts, Copper metal fumes	Cu	64											×
Cotton dust, raw														×
Cresol, all isomers [1319-77-3; 95-48-7; 108-39-4; 106-44-5]	meta-Cresol, 3-Cresol, m-Cresylic acid, 1-Hydroxy-3-methylbenzene, 3-Hydroxytoluene, 3-Methyl phenol	C <sub>7</sub> H <sub>8</sub> O	108		191		×						×	
Crotonaldehyde	2-Butenal, beta-Methyl acrolein, Propylene aldehyde	C <sub>5</sub> H <sub>8</sub> O	70	0.870	102		×						×	
Cumene [98-82-8]	Cumol, Isopropyl benzene, 2-Phenyl propane	C <sub>9</sub> H <sub>12</sub>	120	0.860	152		×						×	
Cyanamide [420-04-2]	Amidocyanogen, Carbimide, Carbodiimide, Cyanogen nitride, Hydrogen cyanamide	CH <sub>2</sub> N <sub>2</sub>	42	1.260	260						NR			
Cyanogen [460-19-5]	Carbon nitride, Dicyan, Dicyanogen, Ethaneditrile, Oxalonitrile	CN	52	0.002	-21						NR			
Cyanogen chloride [506-77-4]	Chlorcyan, Chlorine cyanide, Chlorocyanide, Chlorocyanogen	CCIN	61	0.003	13						NR			
Cyclohexane [110-82-7]	Benzene hexahydride, Hexahydrobenzene, Hexamethylene, Hexanaphthene	C <sub>6</sub> H <sub>12</sub>	84	0.780	81		×						×	
Cyclohexanol [108-93-0]	Anol, Cyclohexyl alcohol, Hexahydrophenol, Hexalin, Hydralin, Hydroxycyclohexane	C <sub>6</sub> H <sub>12</sub> O	100	0.960	162		×						×	

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Cyclohexanone [108-94-1]	Anone, Cyclohexyl ketone, Pimelic ketone	C <sub>6</sub> H <sub>10</sub> O	94	0.950	157		×						×	
Cyclohexene [110-83-8]	Benzene tetrahydride, Tetrahydrobenzene	C <sub>6</sub> H <sub>10</sub>	82	0.810	83		×						×	
Cyclohexylamine [108-91-8]	Aminocyclohexane, Aminohexahydrobenzene, Hexahydroaniline, Hexahydrobenzenamine	C <sub>6</sub> H <sub>13</sub> N	99	0.870	135		×				×		×	
Cyclopentadiene [542-92-7]	1,3-Cyclopentadiene	C <sub>5</sub> H <sub>6</sub>	66	0.800	42		×						×	
Cyclopentane [287-92-3]	Pentamethylene	C <sub>5</sub> H <sub>10</sub>	70	0.750	49		×						×	
2,4-D [94-75-7]	Dichlorophenoxyacetic acid; 2,4-Dichlorophenoxyacetic acid	C <sub>8</sub> H <sub>6</sub> Cl <sub>2</sub> O <sub>3</sub>	221	1.570										Please call to discuss
DDT (Dichlorodiphenyltrichloroethane) [50-29-3]	p,p'-DDT; Dichlorodiphenyltrichloroethane; 1,1,1-Trichloro-2,2-bis(p-chlorophenyl)ethane	C <sub>10</sub> H <sub>14</sub> N <sub>2</sub> O <sub>4</sub>	355	0.990		109								Please call to discuss
Decaborane [17702-41-9]	Decaborane tetradecahydride	BH <sub>3</sub>	122	0.940	213									NR
Demeton [8065-48-3]	O-O-Diethyl-O(and S)-2-(ethylthio)ethyl phosphorothioate mixture; Systox®	C <sub>16</sub> H <sub>38</sub> O <sub>6</sub> P <sub>2</sub> S <sub>4</sub>	258	1.120	134		×						×	
Diacetone alcohol [123-42-2]	Diacetone, 4-Hydroxy-4-methyl-2-pentanone, 2-Methyl-2-pentanol-4-one	C <sub>8</sub> H <sub>16</sub> O <sub>2</sub>	116	0.940	168		×						×	
Diazinon [333-41-5]	Basudin®; Diazide®; O,O-Diethyl-O-2-isopropyl-4-methyl-6-pyrimidinyl-phosphorothioate; Spectracide®	C <sub>12</sub> H <sub>21</sub> N <sub>2</sub> O <sub>3</sub> PS	304											NR
Diazomethane [334-88-3]	Azimethylene, Azomethylene, Diazirine	CH <sub>2</sub> N <sub>2</sub>	42	0.002	-23									NR
Diborane [19287-45-7]	Boroethane, Boron hydride, Diboron hexahydride	B <sub>2</sub> H <sub>6</sub>	28	0.001	-92									NR
2,6-Di-tert-butyl-p-cresol [Butylated hydroxytoluene (BHT)] [128-37-0]		C <sub>15</sub> H <sub>24</sub> O	220	1.050	265									×
Dichlorobenzene [95-50-1]	o-DCB; 1,2-Dichlorobenzene; ortho-Dichlorobenzene; o-Dichlorobenzol	C <sub>6</sub> H <sub>4</sub> Cl <sub>2</sub>	147	1.300	180		×						×	
3,3N-Dichlorobenzidine [91-94-1]			253		178									×
Dichlorodifluoromethane [75-71-8]	Difluorodichloromethane; Fluorocarbon 12; Freon® 12; Genetron® 12; Halon® 122; Propellant 12; Refrigerant 12	CCl <sub>2</sub> F <sub>2</sub>	120		-29		×						×	
1,3-Dichloro-5,5-dimethyl hydantoin [118-52-5]		C <sub>5</sub> H <sub>6</sub> Cl <sub>2</sub> N <sub>2</sub> O <sub>2</sub>	197											NR
1,1-Dichloroethane [75-34-3]	Asymmetrical dichloroethane; Ethylidene chloride; 1,1-Ethylidene dichloride	C <sub>2</sub> H <sub>4</sub> Cl <sub>2</sub>	99	1.180	57		×						×	
1,2-Dichloroethylene, sym [540-59-0], cis [156-59-2], and trans [156-60-5]		C <sub>2</sub> H <sub>2</sub> Cl <sub>2</sub>	97	1.270	59		×						×	
Dichloroethyl ether [111-44-4]	bis(2-Chloroethyl)ether; 2,2'-Dichlorodiethyl ether; 2,2'-Dichloroethyl ether	C <sub>4</sub> H <sub>8</sub> Cl <sub>2</sub> O	143	1.220	179		×						×	
Dichlorofluoromethane [75-43-4]	Dichlorofluoromethane; Fluorodichloromethane; Freon® 21; Genetron® 21; Halon® 112; Refrigerant	CHCl <sub>2</sub> F	103	0.004	9									Please call to discuss
1,1-Dichloro-1-nitroethane [594-72-9]	Dichloronitroethane	C <sub>2</sub> H <sub>3</sub> Cl <sub>2</sub> NO <sub>2</sub>	144	1.430	124									Please call to discuss
1,3-Dichloropropene [542-75-6]	3-Chloroallyl chloride; DCP; 1,3-Dichloro-1-propene; 1,3-Dichloropropylene; Telone®	C <sub>3</sub> H <sub>4</sub> Cl <sub>2</sub>	111	1.210	103									Please call to discuss
2,2-Dichloropropionic acid [75-99-0]	Dalapon; 2,2-Dichloropropanoic acid; alpha,alpha-Dichloropropionic acid	C <sub>3</sub> H <sub>4</sub> Cl <sub>2</sub> O <sub>2</sub>	143	1.400	98		×						×	
Dichlorotetrafluoroethane [76-14-2]	1,2-Dichlorotetrafluoroethane; Freon® 114; Genetron® 114; Halon® 242; Refrigerant 114	C <sub>2</sub> Cl <sub>2</sub> F <sub>4</sub>	171	0.007	4		×						×	
Dichlorvos [62-73-7]	DDVP; 2,2-Dichlorovinyl dimethyl phosphate	C <sub>4</sub> H <sub>7</sub> Cl <sub>2</sub> O <sub>4</sub> P	221	1.420	77		NR							NR
Dicrotophos [141-66-2]	Bidrin®; Carbicron®; 2-Dimethyl-cis-2-dimethylcarbamoyl-1-methylvinylphosphate	C <sub>8</sub> H <sub>16</sub> NO <sub>5</sub> P	237	1.220	400		NR							NR

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Dicyclopentadiene [77-73-6]	Bicyclopentadiene; DCPD; 1,3-Dicyclopentadiene dimer; 3a,4,7,7a-Tetrahydro-4,7-methanoindene	C <sub>10</sub> H <sub>12</sub>	132	0.980	167		x						x	
Dieldrin [60-57-1]	HEOD; 1,2,3,4,10,10-Hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-octahydro-1,4-endo,exo-5,8-dimethanonaphthalene	C <sub>12</sub> H <sub>6</sub> Cl <sub>6</sub> O	381	1.750										Please call to discuss
Diethanolamine [111-42-2]	DEA; Di(2-hydroxyethyl)amine; 2,2'-Dihydroxydiethylamine; Diolamine; bis(2-Hydroxyethyl)amine; 2,2'-Iminodiethanol	C <sub>4</sub> H <sub>11</sub> NO <sub>2</sub>	105	1.100			x						x	
Diethylamine [109-89-7]	Diethylamine; N,N-Diethylamine; N-Ethylethanamine	C <sub>4</sub> H <sub>11</sub> N	73	0.710	56					x			x	
2-Diethylaminoethanol [100-37-8]	Diethylaminoethanol; 2-Diethylaminoethyl alcohol; N,N-Diethylethanolamine; Diethyl-(2-hydroxyethyl)amine; 2-Hydroxytriethylamine	C <sub>6</sub> H <sub>15</sub> NO	117	0.890	162		x						x	
Diethyl ketone [96-22-0]	anhydride	C <sub>6</sub> H <sub>10</sub> O	86	0.810	102		x						x	
Diethyl phthalate [84-66-2]	DEP, Diethyl ester of phthalic acid, Ethyl phthalate	C <sub>12</sub> H <sub>14</sub> O <sub>4</sub>	222	1.120	302									NR
Difluorodibromomethane [75-61-6]		CBF <sub>2</sub> F <sub>2</sub>	210	2.290	23									Please call to discuss
Diglycidyl ether (DGE) [2238-07-5]	Diallyl ether dioxide; DGE; di (2,3-epoxypropyl) ether; 2-Epoxypropyl ether; bis(2,3)-Epoxypropyl) ether	C <sub>6</sub> H <sub>10</sub> O <sub>3</sub>	130	1.120	260									NR
Diisobutyl ketone [108-83-8]	DIBK, Sym-Diisopropyl acetone; 2-6-Diethyl-4-heptanone; Isovalerone; Valerone	C <sub>9</sub> H <sub>18</sub> O	142	0.810	166		x						x	
Diisopropylamine [108-18-9]	DIPA, N-(1-Methylethyl)-2-propanamine	C <sub>6</sub> H <sub>13</sub> N	101	0.720	83		x						x	
Dimethylacetamide [127-19-5]		C <sub>4</sub> H <sub>9</sub> NO	87	0.940	165									Please call to discuss
Dimethylamine [124-40-3]	Dimethylamine (anhydrous), N-Methylmethanamine	C <sub>2</sub> H <sub>7</sub> N	45	0.002	7									NR
Dimethylaniline (N,N-Dimethylaniline) [121-69-7]	N,N-Dimethylbenzeneamine; N,N-Dimethylphenylamine	C <sub>10</sub> H <sub>11</sub> N	121	0.960	193		x				x		x	
Dimethylformamide [68-12-2]	Dimethyl formamide; N,N-Dimethylformamide; DMF	C <sub>3</sub> H <sub>7</sub> NO	73	0.950	153		x						x	
1,1-Dimethylhydrazine [57-14-7]	Dimazine, DMH, UDMH, Unsymmetrical dimethylhydrazine	C <sub>2</sub> H <sub>6</sub> N <sub>2</sub>	60	0.790	63									NR
Dimethyl sulfate [77-78-1]	Dimethyl ester of sulfuric acid, Dimethylsulfate, Methyl sulfate	C <sub>2</sub> H <sub>6</sub> O <sub>4</sub> S	126	1.330	188									NR
Dinitolmide [148-01-6]	3,5-Dinitro-o-toluamide; 2-Methyl-3,5-dinitrobenzamide; Zoalene	C <sub>8</sub> H <sub>7</sub> N <sub>3</sub> O <sub>5</sub>	225			177	x						x	
Dinitrobenzene, all isomers [528-29-0; 99-65-0; 100-25-4]		C <sub>6</sub> H <sub>4</sub> N <sub>2</sub> O <sub>4</sub>	168		299									NR
Dinitro-o-cresol [534-52-1]			198	1.100	312									Please call to discuss
4-Dioxane [123-91-1]	Diethylene dioxide; Diethylene ether; Dioxan; p-Dioxane; 1,4-Dioxane	C <sub>4</sub> H <sub>8</sub> O <sub>2</sub>	88	1.030	101		x						x	
Diioxathion [78-34-2]	Delnav <sup>®</sup> ; p-Dioxane-2,3-diyl ethyl phosphorodithioate; Dioxane phosphate; 2,3-p-Dioxanethiol-S,S-bis(O,O-diethyl phosphoro-dithioate); Navadel <sup>®</sup>	C <sub>12</sub> H <sub>20</sub> O <sub>6</sub> P <sub>2</sub> S <sub>4</sub>	457	1.260		-20								NR
Diphenylamine [122-39-4]	Anilinobenzene, DPA, Phenylaniline, N-Phenylaniline, N-Phenylbenzenamine	C <sub>12</sub> H <sub>11</sub> N	169	1.160	302									Please call to discuss
Diquat [2764-72-9]	Diquat dibromide; 1,1'-Ethylene-2,2'-bipyridylium dibromide	C <sub>12</sub> H <sub>12</sub> Br <sub>2</sub> N <sub>2</sub>	344											NR
Disulfiram [97-77-8]	Antabuse <sup>®</sup> ; bis(Diethylthiocarbamoyl) disulfide; Ro-Sulfiram <sup>®</sup> ; TETD; Tetraethylthiuram disulfide	C <sub>10</sub> H <sub>20</sub> N <sub>2</sub> S <sub>4</sub>	297	1.300		72								NR
Disulfoton [298-04-4]	O,O-Diethyl S-2-(ethylthio)-ethyl phosphorodithioate; Di-Syston <sup>®</sup> ; Thiodemeton	C <sub>8</sub> H <sub>18</sub> O <sub>2</sub> PS <sub>3</sub>	274	1.140	62									NR
Diuron [330-54-1]	3-(3,4-Dichlorophenyl)-1,1-dimethylurea; Direx <sup>®</sup> ; Karmex <sup>®</sup>	C <sub>7</sub> H <sub>10</sub> Cl <sub>2</sub> N <sub>2</sub> O	233			154								NR
Divinyl benzene [1321-74-0]	Diethyl benzene, DVB, Vinylstyrene	C <sub>10</sub> H <sub>10</sub>	130	0.930	195		x						x	

CHEMICAL REFERENCE LIST		SUBSTANCE CHARACTERISTICS					RECOMMENDED FILTER TYPE							
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Emery [1302-74-5]	Aluminum oxide, Aluminum trioxide, Corundum, Impure corundum, Natural aluminum oxide		102	4.000	2980									x
Endosulfan [115-29-7]	Benzoepin; Endosulphan; 6,7,8,9,10-Hexachloro-1,5,5a,6,9,9a-hexachloro-6,9-methano-2,4,3-benzo-dioxathiepin-3-oxide; Thiodan®	C <sub>7</sub> H <sub>6</sub> Cl <sub>6</sub> O <sub>3</sub> S	407	1.740						NR				
Epichlorohydrin [106-89-8]	1-Chloro-2,3-epoxypropane; 2-Chloropropylene oxide; gamma-Chloropropylene oxide	C <sub>3</sub> H <sub>5</sub> ClO	93	1.180	115					NR				
Ethane [74-84-0]		C <sub>2</sub> H <sub>6</sub>	30			-89				NR				
Ethanol [64-17-5]		C <sub>2</sub> H <sub>6</sub> O	46	0.790	78		x						x	
Ethanolamine [141-43-5]	2-Aminoethanol, beta-Aminoethyl alcohol, Ethylolamine, 2-Hydroxyethylamine, Monoethanolamine	C <sub>2</sub> H <sub>7</sub> NO	61	1.020	171		x						x	
Ethion [563-12-2]	O,O,O',O'-Tetraethyl S,S'-methylene di(phosphorodithioate)	C <sub>8</sub> H <sub>22</sub> O <sub>4</sub> P <sub>2</sub> S <sub>4</sub>	384	1.220		-13				NR				
Ethyl acetate [141-78-6]	Acetic ester, Acetic ether, Ethyl ester of acetic acid, Ethyl ethanoate	C <sub>4</sub> H <sub>8</sub> O <sub>2</sub>	88	0.900	77		x						x	
Ethyl alcohol, see Ethanol	Alcohol, Cologne spirit, Ethanol, EtOH, Grain alcohol	C <sub>2</sub> H <sub>6</sub> O					x						x	
Ethylamine [75-04-7]	Aminoethane, Ethylamine (anhydrous), Monoethylamine	C <sub>2</sub> H <sub>7</sub> N	45	0.002	17					NR				
Ethyl amyl ketone [541-85-5]	Ethyl amyl ketone, 3-Methyl-5-heptanone	C <sub>8</sub> H <sub>16</sub> O	128	0.820	157		x						x	
Ethyl benzene [100-41-4]	Ethylbenzol, Phenylethane	C <sub>8</sub> H <sub>10</sub>	106	0.870	136		x						x	
Ethyl butyl ketone [106-35-4]	Butyl ethyl ketone, 3-Heptanone	C <sub>7</sub> H <sub>14</sub> O	114	0.820	148		x						x	
Ethyl chloride [75-00-3]	Chloroethane, Hydrochloric ether, Monochloroethane, Muriatic ether	C <sub>2</sub> H <sub>5</sub> Cl	65	0.002	12					NR				
Ethyl cyanoacrylate [7085-85-0]	Mecrylate, Methyl cyanoacrylate, Methyl alpha-cyanoacrylate, Methyl ester of 2-cyanoacrylic acid	C <sub>6</sub> H <sub>7</sub> NO <sub>2</sub>	125				x						x	
Ethylene chlorohydrin [107-07-3]	2-Chloroethanol, 2-Chloroethyl alcohol, Ethylene chlorhydrin	C <sub>2</sub> H <sub>5</sub> ClO	81	1.200		129	x						x	
Ethylenediamine [107-15-3]	1,2-Diaminoethane; 1,2-Ethanediamine; Ethylenediamine (anhydrous)	C <sub>2</sub> H <sub>8</sub> N <sub>2</sub>	60	0.910	117		x						x	
Ethylene dibromide [106-93-4]	1,2-Dibromoethane; Ethylene bromide; Glycol dibromide	C <sub>2</sub> H <sub>4</sub> Br <sub>2</sub>	188	2.170	131		x						x	
Ethylene dichloride [107-06-2]	1,2-Dichloroethane; Ethylene chloride; Glycol dichloride	C <sub>2</sub> H <sub>4</sub> Cl <sub>2</sub>	99				x						x	
Ethylene glycol [107-21-1], aerosol	1,2-Dihydroxyethane; 1,2-Ethandiol; Glycol; Glycol alcohol; Monoethylene glycol	C <sub>2</sub> H <sub>6</sub> O <sub>2</sub>	62	1.110	198		x						x	
Ethylene glycol dinitrate (EGDN) [628-96-6]	EGDN; 1,2-Ethandiol dinitrate; Ethylene dinitrate; Ethylene nitrate; Glycol dinitrate; Nitroglycol	C <sub>2</sub> H <sub>4</sub> N <sub>2</sub> O <sub>6</sub>	152	1.490	114					NR				
Ethylene oxide [75-21-8]	Dimethylene oxide; 1,2-Epoxy ethane; Oxirane	C <sub>2</sub> H <sub>4</sub> O	44	0.002	11					NR				
Ethylenimine [151-56-4]	Aminoethylene, Azirane, Aziridine, Dimethyleneimine, Dimethylenimine, Ethylenimine, Ethylimine	C <sub>2</sub> H <sub>5</sub> N	43	0.830	55					NR				
Ethyl ether [60-29-7]	Diethyl ether, Diethyl oxide, Ethyl oxide, Ether, Solvent ether	C <sub>4</sub> H <sub>10</sub> O	74	0.710	35		x						x	
Ethyl formate [109-94-4]	Ethyl ester of formic acid, Ethyl methanoate	C <sub>3</sub> H <sub>6</sub> O <sub>2</sub>	74	0.920	49		x						x	
Ethylidene norbornene [16219-75-3]	ENB, 5-Ethylidenebicyclo(2.2.1)hept-2-ene, 5-Ethylidene-2-norbornene	C <sub>9</sub> H <sub>12</sub>	120							NR				
Ethyl mercaptan [75-08-1]	Ethanethiol, Ethyl sulfhydrate, Mercaptoethane	C <sub>2</sub> H <sub>6</sub> S	62	0.840	36									
Fenamiphos [22224-92-6]	Ethyl 3-methyl-4-(methylthio)phenyl-(1-methylethyl)phosphoramidate; Nemacur®; Phenamiphos	C <sub>13</sub> H <sub>22</sub> NO <sub>3</sub> PS	303	1.140		49				NR				

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Fensulfothion [115-90-2]	Dasanit®; O,O-Diethyl O-(p-methylsulfinyl)phenyl)phosphorothioate; Terracur p®	C <sub>11</sub> H <sub>17</sub> O <sub>4</sub> PS <sub>2</sub>	308	1.200	141									
Fenthion [55-38-9]	Baytex; Entex; O,O-Dimethyl O-3-methyl-4-methylthiophenyl phosphorothioate	C <sub>10</sub> H <sub>15</sub> O <sub>3</sub> PS <sub>2</sub>	278	1.250	87									
Ferbam [14484-64-1]	tris(Dimethyl(dithiocarbamate)iron, Ferric dimethyl dithiocarbamate	C <sub>9</sub> H <sub>18</sub> FeN <sub>3</sub> S <sub>6</sub>	417			180								
Ferrovandium dust [12604-58-9]	Ferrovandium	Fe.V	107											x
Fluorides, as F			varies					x					x	
Fluorine [7782-41-4]	Fluorine-19	F <sub>2</sub>	38	0.002	-187									NR
Fluorotrichloromethane, see Trichlorofluoromethane	Freon® 11; Monofluorotrichloromethane; Refrigerant 11; Trichlorofluoromethane; Trichloromonofluoromethane	CCl <sub>3</sub> F	137	0.006	24									Please call to discuss
Fonofos [944-22-9]	Dyfonate®; Dyphonate; O-Ethyl-S-phenyl ethylphosphorothioate; Fonophos	C <sub>10</sub> H <sub>15</sub> OPS <sub>2</sub>	246	1.150	100									NR
Formaldehyde [50-00-0]	1,3-Dioxacyclopentane; 1,3-dioxolane stab.; Ethylene glycol methylene ether-Formaldehyde ethylene acetal; 1,3-Dioxolane	CH <sub>2</sub> O	30	1.080								x		
Formamide [75-12-7]	Carbamide, Methanamide	CH <sub>3</sub> NO	45	1.130	200									NR
Formic acid [64-18-6]	Formic acid (85-95% in aqueous solution); Hydrogen carboxylic acid; Methanoic acid	CH <sub>2</sub> O <sub>2</sub>	46	1.220	101		x	x						x
Furfural [98-01-1]	Fural, 2-Furancarboxaldehyde, Furfuraldehyde, 2-Furfuraldehyde	C <sub>5</sub> H <sub>4</sub> O <sub>2</sub>	96				x							x
Furfuryl alcohol [98-00-0]	2-Furylmethanol, 2-Hydroxymethylfuran	C <sub>5</sub> H <sub>6</sub> O <sub>2</sub>	98				x							x
Gasoline [8006-61-9]	Motor fuel, Motor spirits, Natural gasoline, Petrol				34		x							x
Glutaraldehyde [111-30-8], activated and inactivated	Glutaric dialdehyde; 1,5-Pentanedial	C <sub>5</sub> H <sub>8</sub> O <sub>2</sub>	100	1.100	187							x		
Glycerin mist [56-81-5]	Glycerin (anhydrous); Glycerol; Glycyl alcohol; 1,2,3-Propanetriol; Trihydroxypropane	C <sub>3</sub> H <sub>8</sub> O <sub>3</sub>	92	1.260	290									NR
Glycidol [556-52-5]	2,3-Epoxy-1-propanol; Epoxypropyl alcohol; Glycide; Hydroxymethyl ethylene oxide; 2-Hydroxymethyl oxiran; 3-Hydroxypropylene oxide	C <sub>3</sub> H <sub>4</sub> O <sub>2</sub>	74	1.120			x							x
Grain dust (oat, wheat, barley)														x
Graphite -all forms except graphite fibers- [7782-42-5]	Black lead, Mineral carbon, Plumbago, Silver graphite, Stove black	C <sub>24</sub> X <sub>12</sub>												x
Hafnium [7440-58-6] and compounds	Celtium, Elemental hafnium, Hafnium metal	C <sub>10</sub> H <sub>15</sub> Cl <sub>3</sub> Hf	178											NR
Halothane [151-67-7]	1-Bromo-1-chloro-2,2,2-trifluoroethane; 2-Bromo-2-chloro-1,1,1-trifluoroethane; 1,1,1-Trifluoro-2-bromo-2-chloroethane; 2,2,2-Trifluoro-1-bromo-1-chloroethane	C <sub>2</sub> HBrClF <sub>3</sub>	197	1.870	50		x							x
n Heptane [142-82-5] (n-Heptane)	Heptane, normal-Heptane	C <sub>7</sub> H <sub>16</sub>	100	0.680	99		x							x
Hexachlorobutadiene [87-68-3]	HCBD; Hexachloro-1,3-butadiene; 1,3-Hexachlorobutadiene; Perchlorobutadiene	C <sub>4</sub> Cl <sub>6</sub>	261	1.550	212									NR
Hexachlorocyclopentadiene [77-47-4]			273	1.710	239									NR
Hexachloroethane [67-72-1]	Carbon hexachloride, Ethane hexachloride, Perchloroethane	C <sub>2</sub> Cl <sub>6</sub>	237			185								
Hexafluoroacetone [684-16-2]	Hexafluoro-2-propanone; 1,1,1,3,3,3-Hexafluoro-2-propanone; HFA; Perfluoroacetone	C <sub>3</sub> F <sub>6</sub> O	166	0.007	-27									NR
Hexamethylene diisocyanate [822-06-0]	1,6-Diisocyanatohexane; HDI; Hexamethylene-1,6-diisocyanate; 1,6-Hexamethylene diisocyanate; HMDI	C <sub>8</sub> H <sub>12</sub> N <sub>2</sub> O <sub>2</sub>	168	1.040										NR
Hexamethyl phosphoramide [680-31-9]	Hexamethylphosphoric triamide, Hexamethyl-phosphorotriamide, HMPA, Tris(dimethylamino)phosphine oxide	C <sub>6</sub> H <sub>18</sub> N <sub>3</sub> OP	179											Please call to discuss

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n Hexane [110-54-3]	Hexane, Hexyl hydride, normal-Hexane	C <sub>6</sub> H <sub>14</sub>	86	0.660	69		x						x	
Hexane, Other isomers	Diethylmethylethane; Diisopropyl; 2,2-Dimethylbutane; 2,3-Dimethylbutane; Isohexane; 2-Methylpentane; 3-Methylpentane	C <sub>6</sub> H <sub>14</sub>	86				x						x	
1,6-Hexanediamine [124-90-4]		C <sub>6</sub> H <sub>16</sub> N <sub>2</sub>	116		24									Please call to discuss
1-Hexene [592-41-6]		C <sub>6</sub> H <sub>12</sub>	84		64		x						x	
sec-Hexyl acetate [108-84-9]	1,3-Dimethylbutyl acetate; Methylisoamyl acetate	C <sub>8</sub> H <sub>16</sub> O <sub>2</sub>	144	0.860	146		x						x	
Hexylene glycol [107-41-5]	2,4-Dihydroxy-2-methylpentane; 2-Methyl-2,4-pentanediol; 4-Methyl-2,4-pentanediol; 2-Methylpentane-2,4-diol	C <sub>6</sub> H <sub>14</sub> O <sub>2</sub>	118	0.920	197						NR			
Hydrazine [302-01-2]	Diamine, Hydrazine (anhydrous), Hydrazine base	C <sub>2</sub> H <sub>4</sub> N <sub>2</sub>	32	1.010	114						NR			
Hydrochloric Acid (7647-01-0) see hydrogen Chloride	Anhydrous hydrogen chloride; Aqueous hydrogen chloride	ClH	37					x					x	
Hydrofluoric Acid (7664-39-3) see hydrogen fluoride	Anhydrous hydrogen fluoride; Aqueous hydrogen fluoride	FH	20					x					x	
Hydrogen [1333-74-0]	Hydrogen, Normal Hydrogen	H <sub>2</sub>	1								NR			
Hydrogenated terphenyls - nonirradiated - [61788-332-7]	Hydrogenated diphenylbenzenes, Hydrogenated phenylbiphenyls, Hydrogenated triphenyls	C <sub>18</sub> H <sub>22</sub>	241											
Hydrogen bromide [10035-10-6]	Anhydrous hydrogen bromide; Aqueous hydrogen bromide	BrH	81	0.003	-67			x					x	
Hydrogen chloride [7647-01-0]	Anhydrous hydrogen chloride; Aqueous hydrogen chloride	ClH	36	0.002	-85			x					x	
Hydrogen cyanide and Cyanide salts, as CN Hydrogen cyanide [74-90-8]	Formonitrile, Hydrocyanic acid, Prussic acid	CHN	27	0.690	26									
Hydrogen fluoride [7664-39-3], as F	Anhydrous hydrogen fluoride; Aqueous hydrogen fluoride	FH	20		20			x					x	
Hydrogen peroxide [7722-84-1]	High-strength hydrogen peroxide, Hydrogen dioxide, Hydrogen peroxide (aqueous), Hydroperoxide, Peroxide	H <sub>2</sub> O <sub>2</sub>	34	1.390	152									Please call to discuss
Hydrogen selenide [7783-07-5], as Se	Selenium dihydride, Selenium hydride	H <sub>2</sub> Se	81	0.003	-41						NR			
Hydrogen sulfide [7783-06-4]	Hydrosulfuric acid, Sewer gas, Sulfuretted hydrogen	H <sub>2</sub> S	34	0.001	-60			x					x	
Hydroquinone [123-31-9]	Hydroquinone monomethyl ether, p-Hydroxyanisole, Mequinol, p-Methoxyphenol, Monomethyl ether hydroquinone	C <sub>6</sub> H <sub>6</sub> O <sub>2</sub>	110	1.330	286									x
2-Hydroxypropyl acrylate [999-61-1]	HPA, beta-Hydroxypropyl acrylate, Propylene glycol monoacrylate	C <sub>6</sub> H <sub>10</sub> O <sub>3</sub>	130								NR			
Indene [95-13-6]	Bicyclopentadiene; DCPD; 1,3-Dicyclopentadiene dimer; 3a,4,7,7a-Tetrahydro-4,7-methanoindene	C <sub>9</sub> H <sub>8</sub>	116	0.997	182									Please call to discuss
Indium [7440-74-6] and compounds, as In	Indium metal	In	49	7.310										x
Iodine [7553-56-2]	Iodine crystals, Molecular iodine	I <sub>2</sub>	254	4.930	185				x					
Iodoform [75-47-8]	Triiodomethane	CHI <sub>3</sub>	394						x					
Iron pentacarbonyl [13463-40-6], as Fe	Iron carbonyl, Pentacarbonyl iron	Fe(CO) <sub>5</sub>	196								NR			
Iron salts, soluble, as Fe	FeSO <sub>4</sub> : Ferrous sulfate, Iron(II) sulfate	FeMoO <sub>4</sub>	(Varies)											x
Isobutyl acetate [110-19-0]	Isobutyl ester of acetic acid, 2-Methylpropyl acetate, 2-Methylpropyl ester of acetic acid, beta-Methylpropyl ethanoate	C <sub>6</sub> H <sub>12</sub> O <sub>2</sub>	116	0.870	117		x						x	
Isobutyl alcohol [78-83-1]	IBA, Isobutanol, Isopropylcarbinol, 2-Methyl-1-propanol	C <sub>4</sub> H <sub>10</sub> O	74	0.800	108		x						x	



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Isooctyl alcohol [26952-21-6]	Isooctanol, Oxooctyl alcohol	C <sub>8</sub> H <sub>18</sub> O	130	0.830	182									Please call to discuss
Isophorone [78-59-1]	Isoacetophorone; 3,5,5-Trimethyl-2-cyclohexenone; 3,5,5-Trimethyl-2-cyclohexen-1-one	C <sub>9</sub> H <sub>16</sub> O	138	0.920	215		x						x	
Isophorone diisocyanate [4098-71-9]	3-Isocyanatomethyl-3,5,5-trimethylcyclohexyl-isocyanate; Isophorone diamine diisocyanate	C <sub>11</sub> H <sub>14</sub> N <sub>2</sub> O <sub>3</sub>	222	1.060	158									NR
2-Isopropoxyethanol [109-59-1]	Ethylene glycol isopropyl ether; beta-Hydroxyethyl isopropyl ether; Isopropyl Cellosolve®; Isopropyl glycol	C <sub>8</sub> H <sub>12</sub> O <sub>2</sub>	104	0.900	139									Please call to discuss
Isopropyl acetate [108-21-4]	Isopropyl ester of acetic acid, 1-Methylethyl ester of acetic acid, 2-Propyl acetate	C <sub>9</sub> H <sub>10</sub> O <sub>2</sub>	102	0.870	88		x						x	
Isopropyl alcohol [67-63-0]	Dimethyl carbinol, IPA, Isopropanol, 2-Propanol, sec-Propyl alcohol, Rubbing alcohol	C <sub>3</sub> H <sub>8</sub> O	60	0.790	83		x						x	
Isopropylamine [75-31-0]	DIPA, N-(1-Methylethyl)-2-propanamine	C <sub>3</sub> H <sub>9</sub> N	59	0.690	34		x						x	
Isopropylaniline [768-52-5]	N-IPA, Isopropylaniline, N-(1-Methylethyl)-benzenamine, N-Phenylisopropylamine	C <sub>9</sub> H <sub>13</sub> N	135	0.930	206									Please call to discuss
Isopropyl ether [108-20-3]	Ethylene glycol isopropyl ether; beta-Hydroxyethyl isopropyl ether; Isopropyl Cellosolve®; Isopropyl glycol	C <sub>8</sub> H <sub>18</sub> O	102	0.730	69		x						x	
Isopropyl glycidyl ether (IGE) [4016-14-2]	1,2-Epoxy-3-isopropoxypropane; IGE; Isopropoxymethyl oxirane	C <sub>8</sub> H <sub>12</sub> O <sub>2</sub>	116	0.920	127		x						x	
Ketene [463-51-4]	Carbomethene, Ethenone, Keto-ethylene	C <sub>2</sub> H <sub>2</sub> O	42	0.002	-56									NR
Lactic Acid (50-21-5)	Lactic Acid Ethyl Ester; Propanoic Acid, 2-Hydroxy-, Ethyl Ester	C <sub>5</sub> H <sub>8</sub> O <sub>3</sub>	90		123									Please call to discuss
Lead, elemental [7439-92-1], and inorganic compounds, as Pb	Lead metal, Plumbum	Pb	207 (Varies)											x
Lead arsenate [7784-40-9], as Pb <sub>3</sub> (AsO <sub>4</sub> ) <sub>2</sub>		AsHO <sub>4</sub> Pb	347											x
Lead chromate [7758-97-6], as Pb <sub>3</sub> , as Cr		CrO <sub>4</sub> Pb	323			844								x
Lindane [58-89-9]	BHC; HCH; gamma-Hexachlorocyclohexane; gamma isomer of 1,2,3,4,5,6-Hexachloro-cyclohexane	C <sub>6</sub> H <sub>6</sub> Cl <sub>6</sub>	291	1.850										Please call to discuss
Lithium hydride [7580-67-8]	Lithium monohydride	HLi	8	0.780		680								x
L.P.G. (Liquefied petroleum gas) [68476-85-7]	Bottled gas, Compressed petroleum gas, Liquefied hydrocarbon gas, Liquefied petroleum gas, LPG	C <sub>3</sub> H <sub>8</sub>	42-58											Please call to discuss
Magnesite [546-93-0]	Carbonate magnesium, Hydromagnesite, Magnesium carbonate, Magnesium(II) carbonate	CMgO <sub>3</sub>	84	2.960										x
Magnesium oxide fume [1309-48-4]	Magnesia fume	CMgO <sub>3</sub>	40	3.580										x
Maleic anhydride [108-31-6]	cis-Butenedioic anhydride; 2,5-Furanedione; Maleic acid anhydride; Toxicic anhydride	C <sub>4</sub> H <sub>2</sub> O <sub>3</sub>	98	1.480	188									Please call to discuss
Manganese, elemental [7439-96-5], and inorganic compounds, as Mn	Manganese metal; Colloidal manganese, Manganese-55	Mn	55 (Varies)	7.200										x
Manganese cyclopentadienyl tricarbonyl [12079-65-1], as Mn	Cyclopentadienylmanganese tricarbonyl, Cyclopentadienyl tricarbonyl manganese, MCT	C <sub>9</sub> H <sub>5</sub> MnO <sub>3</sub> s*	204											NR
Mercury [7439-97-6], as Hg Alkyl compounds Aryl compounds Inorganic forms, including metallic mercury	Mercury metal; Colloidal mercury, Metallic mercury, Quicksilver	C <sub>4</sub> F <sub>6</sub> HgO <sub>4</sub>	201 (Varies) (Varies) (Varies)						x					

CHEMICAL REFERENCE LIST		SUBSTANCE CHARACTERISTICS					RECOMMENDED FILTER TYPE							
Substance [CAS No.]	Synonyms	Chemical Formula	Mol. Weight (MW)	Specific Gravity (SG)	Boiling Point (Bp °C)	Melting Point (Mp °C)	GP Plus!	ACI Plus/ SUL	ACR	ACM	AMM	FOR	EDU	HEPA / ULPA
Mesityl oxide [141-79-7]	Isobutenyl methyl ketone, Isopropylideneacetone, Methyl isobutenyl ketone, 4-Methyl-3-penten-2-one	C <sub>8</sub> H <sub>10</sub> O	98	0.860	130		×						×	
Methacrylic acid [79-41-4]	Methacrylic acid, isobutyl ester; Isobutyl «alpha»-methacrylate; isobutyl methacrylate; isobutyl 2-methyl-2-propenoate; 2-Methylpropyl methacrylate; isobutyl «alpha»-methacrylate; isobutylester kyseliny methakrylove; isobutyl methacrylate, inhibited; UN 2283; isobutyl 2-methylacrylate	C <sub>6</sub> H <sub>10</sub> O	86				×						×	
Methane [74-82-8]		CH <sub>4</sub>	16	-162.000										
Methanol [67-56-1]		CH <sub>3</sub> O	32											
Methomyl [16752-77-5]	Lannate®; Methyl N-((methylamino)carbonyloxy)ethanimidothioate; S-Methyl-N(methylcarbomoyloxy)thioacetimidate	C <sub>5</sub> H <sub>10</sub> N <sub>2</sub> O <sub>2</sub> S	162	1.290		78								
4-Methoxyphenol [150-76-5]	Hydroquinone monomethyl ether, p-Hydroxyanisole, Mequinol, p-Methoxyphenol, Monomethyl ether hydroquinone	C <sub>7</sub> H <sub>8</sub> O <sub>2</sub>	124	1.550	246									
Methyl acetate [79-20-9]	Methyl ester of acetic acid, Methyl ethanoate	C <sub>3</sub> H <sub>6</sub> O <sub>2</sub>	78	0.930	58		×						×	
Methyl acetylene [74-99-7]	Allylene, Propine, Propyne, 1-Propyne	C <sub>3</sub> H <sub>4</sub>	40	0.002	-23		×						×	
Methyl acetylene-propadiene mixture (MAPP)	MAPP gas, Methyl acetylene-allene mixture, Methyl acetylene-propadiene mixture (stabilized), Propadiene-methyl acetylene, Propyne-allene mixture, Propyne-propadiene mixture	C <sub>6</sub> H <sub>8</sub>	40	0.002	-35		×						×	
Methyl acrylate [96-33-3]	Methoxycarbonylethylene, Methyl ester of acrylic acid, Methyl propenoate	C <sub>6</sub> H <sub>8</sub>	86	0.960	66		×						×	
Methylacrylonitrile [126-98-7]	2-Cyanopropene-1, 2-Cyano-1-propene, Isoprene cyanide, Isopropenylnitrile, Methacrylonitrile, alpha-Methylacrylonitrile, 2-Methylpropenenitrile	C <sub>5</sub> H <sub>5</sub> N	67	0.800	90									
Methylamine [74-89-5]	Dimethylamine (anhydrous), N-Methylmethanamine	CH <sub>5</sub> N	31	0.001	6									
n Methyl aniline [100-61-8]	MA, (Methylamino)benzene, Methylphenylamine, N-Phenylmethylamine	CH <sub>9</sub> N	107	0.990	194									
Methyl bromide [74-83-9]	Bromomethane, Monobromomethane	CH <sub>3</sub> Br	95	0.004	4									
Methyl tert-butyl ether (MTBE) [1634-04-4]	Propane, 2-methoxy-2-methyl- methyl-1,1-dimethylethylether	C <sub>8</sub> H <sub>18</sub> O	88		55									
Methyl n-butyl ketone [591-78-6]	Butyl methyl ketone, MBK, Methyl butyl ketone, Methyl n-butyl ketone	C <sub>8</sub> H <sub>16</sub> O	100	0.810	127		×						×	
Methyl chloride [74-87-3]	Chloromethane, Monochloromethane	CH <sub>3</sub> Cl	50		-24									
Methyl chloroform [71-55-6]	Chloroethene; 1,1,1-Trichloroethane; 1,1,1-Trichloroethane (stabilized)	C <sub>2</sub> H <sub>3</sub> Cl <sub>3</sub>	133	1.340	74		×						×	
Methylcyclohexane [108-87-2]	Cyclohexylmethane, Hexahydrotoluene	C <sub>7</sub> H <sub>14</sub>	98	0.770	100		×						×	
Methylcyclohexanol [25639-42-3]	Hexahydrocresol, Hexahydromethylphenol	C <sub>7</sub> H <sub>14</sub> O	114	0.920	155		×						×	
Methylcyclohexanone [583-60-8]	2-Methylcyclohexanone	C <sub>21</sub> H <sub>36</sub> O <sub>3</sub>	112	0.930	165		×						×	
Methyl Ether (115-10-6) see dimetyl Ether		C <sub>2</sub> H <sub>6</sub> O	46		23									
Methyl ethyl ketone (MEK) [78-93-3]	Methyl acetone, Methyl ethyl ketone	C <sub>4</sub> H <sub>8</sub> O	72	0.810	80		×						×	
Methyl ethyl ketone peroxide [1338-23-4]	2-Butanone peroxide, Ethyl methyl ketone peroxide, MEKP, MEK peroxide, Methyl ethyl ketone hydroperoxide	C <sub>8</sub> H <sub>16</sub> O <sub>6</sub>	176	1.120										
Methyl formate [107-31-3]	Methyl ester of formic acid, Methyl methanoate	C <sub>2</sub> H <sub>4</sub> O <sub>2</sub>	65	0.698	32		×						×	
Methyl iodide [74-88-4]	Iodomethane, Monoiodomethane	CH <sub>3</sub> I	142	2.280	42			×						
Methyl isoamyl ketone [110-12-3]	Isoamyl methyl ketone, Isopentyl methyl ketone, 2-Methyl-5-hexanone, 5-Methyl-2-hexanone, MIAK	C <sub>7</sub> H <sub>14</sub> O	114	0.810	144									
Methyl isobutyl carbinol [108-11-2]	Isobutylmethylcarbinol, Methyl amyl alcohol, 4-Methyl-2-pentanol, MIBC	C <sub>8</sub> H <sub>18</sub> O	102	0.810	132		×						×	

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Methyl isobutyl ketone [108-10-1]	2-Pentanone,4-methyl-; Hexone; MIBK; Isopropylacetone	C <sub>8</sub> H <sub>16</sub> O	100	0.800	116		×						×	
Methyl isocyanate [624-83-9]	Methyl ester of isocyanic acid, MIC	C <sub>2</sub> H <sub>4</sub> O	57	0.960	39						NR			
Methyl isopropyl ketone [563-80-4]	2-Acetyl propane, Isopropyl methyl ketone, 3-Methyl-2-butanone, 3-Methyl butan-2-one, MIPK	C <sub>8</sub> H <sub>16</sub> O	86	0.810	93						Please call to discuss			
Methyl mercaptan [74-93-1]	Mercaptomethane, Methanethiol, Methyl sulfhydrate	CH <sub>3</sub> S	48	1.001	6						NR			
Methyl methacrylate [80-62-6]	Methacrylate monomer, Methyl ester of methacrylic acid, Methyl-2-methyl-2-propenoate	C <sub>8</sub> H <sub>8</sub> O <sub>2</sub>	100	94.000	101		×						×	
Methyl silicate [681-84-5]	Methyl orthosilicate, Tetramethoxysilane, Tetramethyl ester of silicic acid, Tetramethyl silicate	C <sub>4</sub> H <sub>12</sub> O <sub>4</sub> Si	152	1.020	121						NR			
α Methyl styrene [98-83-9]	AMS, Isopropenyl benzene, 1-Methyl-1-phenylethylene, 2-Phenyl propylene	C <sub>9</sub> H <sub>10</sub>	118	0.910	152		×						×	
Metribuzin [20187-64-9]	4-Amino-6-(1,1-dimethylethyl)-3-(methylthio)-1,2,4-triazin-5(4H)-one	C <sub>9</sub> H <sub>10</sub>	214								NR			
Mevinphos [7786-34-7]	2-Carbomethoxy-1-methylvinyl dimethyl phosphate, Mevinphos [Note: Commercial product is a mixture of the cis- & trans-isomers.]	C <sub>7</sub> H <sub>13</sub> O <sub>6</sub> P	224		106						NR			
Mica [12001-26-2]	Biotite, Lepidolite, Margarite, Muscovite, Phlogopite, Roscoelite, Zimwaldite	Al <sub>2</sub> K <sub>2</sub> O <sub>6</sub> Si												×
Monocrotophos [6923-22-4]	3-Hydroxy-N-methylcrotonamide dimethylphosphate, Monocron	C <sub>7</sub> H <sub>14</sub> NO <sub>5</sub> P	223	125.000							NR			
Naphthalene [91-20-3]	Naphthalin, Tar camphor, White tar	C <sub>10</sub> H <sub>8</sub>	128	1.150	218						Please call to discuss			
2 Naphthylamine [91-59-8]	2-Aminonaphthalene, 2-Naphthylamine	C <sub>10</sub> H <sub>9</sub> N	143	1.060	306						NR			
Nickel Elemental/metal [7440-02-0] Soluble compounds, as Ni Insoluble compounds, as Ni	Nickel metal: Elemental nickel, Nickel catalyst.	Ni	59								NR			
Nickel carbonyl [13463-39-3], as Ni	Nickel tetracarbonyl, Tetracarbonyl nickel	C <sub>4</sub> NiO <sub>4</sub>	171	1.320	43						NR			
Nickel subsulfide [12035-72-2], as Ni		Ni <sub>3</sub> S <sub>2</sub>	240		790									×
Ninhydrin (485-47-2)	Ninhydrin monohydrate, 1,2,3-triketohydrindene monohydrate, 1,2,3-indantione monohydrate, 2,2-dihydroxy-1,3-indandione, 1H-indene-1,2,3-trione monohydrate, triketohydrindene hydrate	C <sub>9</sub> H <sub>6</sub> O <sub>4</sub>					×						×	
Nitric acid [7697-37-2]	Barium dinitrate, Barium(II) nitrate (1.2), Barium salt of nitric acid	HNO <sub>3</sub>	63	1.500				×					×	
Nitric oxide [10102-43-9]	Mononitrogen monoxide, Nitrogen monoxide	NO	30	0.001	0						Please call to discuss			
p-Nitroaniline [100-01-6]	para-Aminonitrobenzene, 4-Nitroaniline, 4-Nitrobenzenamine, p-Nitrophenylamine, PNA	C <sub>6</sub> H <sub>6</sub> N <sub>2</sub> O <sub>2</sub>	138	1.420	332						Please call to discuss			
Nitrobenzene [98-95-3]	Essence of mirbane, Nitrobenzol, Oil of mirbane	C <sub>10</sub> H <sub>12</sub> N <sub>2</sub> O <sub>3</sub>	123	1.200	210		×						×	
Nitroethane [79-24-3]	Nitroetan	C <sub>2</sub> H <sub>5</sub> NO <sub>2</sub>	75	1.050	114		×						×	
Nitrogen dioxide [10102-44-0]	Dinitrogen tetroxide (N2O4), Nitrogen peroxide	NO <sub>2</sub>	46	0.003	21						NR			
Nitrogen trifluoride [7783-54-2]	Nitrogen fluoride, Trifluorammine, Trifluorammonia	F <sub>3</sub> N	71	0.003	-129						NR			
1-Nitropropane [108-03-2]	Nitropropane, 1-NP	C <sub>3</sub> H <sub>7</sub> NO <sub>2</sub>	89	100.000	132		×						×	
2-Nitropropane [79-46-9]	Dimethylnitromethane, iso-Nitropropane, 2-NP	C <sub>3</sub> H <sub>7</sub> NO <sub>2</sub>	89	0.990	120		×						×	
Nitrous oxide [10024-97-2]	Dinitrogen monoxide, Hyponitrous acid anhydride, Laughing gas	N <sub>2</sub> O	43	0.001	-89						NR			
Nonane [111-84-2], all isomers	n-Nonane, Nonyl hydride	C <sub>9</sub> H <sub>20</sub>	128	0.720	151		×						×	

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Nuisance particulates, see Particulates (Insoluble) Not Otherwise Classified (PNOC)														x
n Octane [111-65-9]	normal-Octane	C <sub>8</sub> H <sub>18</sub>	114	0.700	126					NR				
Oil mist, mineral							x						x	x
Osmium tetroxide [20816-12-0], as Os	Osmic acid anhydride, Osmium oxide	O <sub>4</sub> Os	254	5.100						NR				
Oxalic acid [144-62-7]	Ethanedioic acid, Oxalic acid (aqueous), Oxalic acid dihydrate	C <sub>2</sub> H <sub>2</sub> O <sub>4</sub>	90	1.900						Please call to discuss				
Oxygen difluoride [7783-41-7]	Difluorine monoxide, Fluorine monoxide, Oxygen fluoride	F <sub>2</sub> O	54	0.002	-145					NR				
Paraffin wax fume [8002-74-2]	Paraffin fume, Paraffin scale fume	C <sub>n</sub> H <sub>2n</sub>				47	x						x	
Paraquat [4685-14-7]	1,1'-Dimethyl-4,4'-bipyridinium dichloride; N,N'-Dimethyl-4,4'-bipyridinium dichloride; Paraquat chloride; Paraquat dichloride	C <sub>12</sub> H <sub>14</sub> N <sub>2</sub> ·2	257	1.240		300				NR				
Parathion [56-38-2]	O,O-Diethyl-O(p-nitrophenyl) phosphorothioate; Diethyl parathion; Ethyl parathion; Parathion-ethyl	C <sub>10</sub> H <sub>14</sub> NO <sub>3</sub> PS	291	1.270	375					NR				
Particulate polycyclic aromatic hydrocarbons (PPAH), see Coal tar pitch volatiles														x
Particulates (Insoluble) Not Otherwise Classified (PNOC)														x
Inhalable particulate														
Respirable particulate														
Pentaborane [19624-22-7]	Pentaboron nonahydride	C <sub>10</sub> H <sub>14</sub> NO <sub>3</sub> PS	63	0.620	60					NR				
Pentachloronaphthalene [1321-64-8]	Halowax® 1013; 1,2,3,4,5-Pentachloro-naphthalene	C <sub>10</sub> H <sub>3</sub> Cl <sub>5</sub>	300	1.670	326					Please call to discuss				
n Pentane, all isomers [78-78-4; 109 66 0; 463-82-1]	Pentane, normal-Pentane	C <sub>5</sub> H <sub>12</sub>	72	0.630	36		x						x	
Perchloromethyl mercaptan [594-42-3]	PCM, PMM, Trichloromethane sulfonyl chloride, Trichloromethyl sulfur chloride	CCl <sub>3</sub> S	186							NR				
Perchloryl fluoride [7616-94-6]	Chlorine fluoride oxide, Chlorine oxyfluoride, Trioxychlorofluoride	ClFO	102							NR				
Perlite [93763-70-3]	Expanded perlite													x
Phenol [108-95-2]	Carbolic acid, Hydroxybenzene, Monohydroxybenzene, Phenyl alcohol, Phenyl hydroxide	C <sub>6</sub> H <sub>6</sub> O	94	1.060	182		x						x	
Phenothiazine [92-84-2]	Dibenzothiazine, Fenothiazine, Thiodiphenylamine	C <sub>12</sub> H <sub>8</sub> NS	199							NR				
Phenylenediamine [95-54-5]		C <sub>6</sub> H <sub>8</sub> N <sub>2</sub>	108							NR				
Phenylenediamine [108-45-2]		C <sub>6</sub> H <sub>8</sub> N <sub>2</sub>	108							NR				
Phenylenediamine [106-50-3]		C <sub>6</sub> H <sub>8</sub> N <sub>2</sub>	108							NR				
Phenyl ether [101-84-8], vapor	Diphenyl ether, Diphenyl oxide, Phenoxy benzene, Phenyl oxide	C <sub>12</sub> H <sub>10</sub> O	170	1.080	259		x						x	
Phosgene [75-44-5]	Carbon oxychloride, Carbonyl chloride, Carbonyl dichloride, Chloroformyl chloride	CCl <sub>2</sub> O	99	0.004	8					NR				
Phosphine [7803-51-2]	Hydrogen phosphide, Phosphorated hydrogen, Phosphorus hydride, Phosphorus trihydride	H <sub>3</sub> P	34	0.001	-88					NR				
Phosphoric acid [7664-38-2]	Orthophosphoric acid, Phosphoric acid (aqueous), White phosphoric acid	H <sub>3</sub> O <sub>3</sub> P	98	1.870	276			x					x	
Phosphorus (yellow) [7723-14-0]	Elemental phosphorus, White phosphorus	P	124											x
Phosphorus pentachloride [10026-13-8]	Pentachlorophosphorus, Phosphoric chloride, Phosphorus perchloride	Cl <sub>5</sub> P	208	3.600						NR				

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Phosphorus pentasulfide [1314-80-3]	Phosphorus persulfide, Phosphorus sulfide, Sulfur phosphide	PS <sub>5</sub>	222	2.090	-85									NR
Phosphorus trichloride [7719-12-2]	Phosphorus chloride	Cl <sub>3</sub> P	138	1.580	76									Please call to discuss
Phthalic anhydride [85-44-9]	1,2-Benzenedicarboxylic anhydride; PAN; Phthalic acid anhydride	C <sub>8</sub> H <sub>4</sub> O <sub>3</sub>	148	1.530										Please call to discuss
n Phthalodinitrile [626-17-5]		C <sub>8</sub> H <sub>3</sub> N <sub>3</sub> O <sub>2</sub>	128											NR
Picloram [1918-02-1]	4-Amino-3,5,6-trichloropicolinic acid; 4-Amino-3,5,6-trichloro-2-picolinic acid; ATCP; Tordon®	C <sub>6</sub> H <sub>3</sub> Cl <sub>3</sub> N <sub>2</sub> O <sub>2</sub>	241											NR
Picric acid [88-89-1]	Phenol trinitrate; 2,4,6-Trinitrophenol	C <sub>6</sub> H <sub>3</sub> N <sub>3</sub> O <sub>7</sub>	229	1.760	300									NR
Piperazine dihydrochloride [142-64-3]	Piperazine hydrochloride	C <sub>4</sub> H <sub>12</sub> Cl <sub>2</sub> N <sub>2</sub>	159											NR
Platinum [7440-06-4] Metal Soluble salts, as Pt	Synonyms vary depending upon the specific soluble platinum salt	Pt	195 (Varies)	21.450	3827									x
Potassium hydroxide [1310-58-3]	Caustic potash, Lye, Potassium hydrate	HKO	56	2.040	405									x
Propane [74-98-6]	Bottled gas, Dimethyl methane, n-Propane, Propyl hydride	C <sub>3</sub> H <sub>8</sub>	44	0.002	-42									NR
Propanol (n-Propyl alcohol) [71-23-8]	Ethyl carbinol, 1-Propanol, n-Propanol, Propyl alcohol	C <sub>3</sub> H <sub>8</sub> O	60	0.810	97		x						x	
Propargyl alcohol [107-19-7]	1-Propyn-3-ol; 2-Propyn-1-ol; 2-Propynyl alcohol	C <sub>3</sub> H <sub>4</sub> O	56	0.970	114		x						x	
b Propiolactone [57-57-8]		C <sub>3</sub> H <sub>4</sub> O <sub>2</sub>	72											NR
Propionic acid [79-09-4]	Carboxyethane, Ethanecarboxylic acid, Ethylformic acid, Metacetonic acid, Methyl acetic acid, Propanoic acid	C <sub>3</sub> H <sub>6</sub> O <sub>2</sub>	74	0.990	141									Please call to discuss
Propoxur [114-26-1]	Aprocarb®; o-Isopropoxyphenyl-N-methylcarbamate; N-Methyl-2-isopropoxy-phenyl-carbamate	C <sub>11</sub> H <sub>16</sub> NO <sub>3</sub>	209											NR
n Propyl acetate [109-60-4]	Propylacetate, n-Propyl ester of acetic acid	C <sub>6</sub> H <sub>10</sub> O <sub>2</sub>	102	0.840	102		x						x	
Propylene dichloride [78-87-5]	Dichloro-1,2-propane; 1,2-Dichloropropane	C <sub>3</sub> H <sub>2</sub> Cl <sub>2</sub>	113	1.160	97		x						x	
Propylene glycol dinitrate [6423-43-4]	PGDN; Propylene glycol-1,2-dinitrate; 1,2-Propylene glycol dinitrate	C <sub>3</sub> H <sub>6</sub> N <sub>2</sub> O <sub>6</sub>	166											NR
Propylene glycol monomethyl ether [107-98-2]	Dipropylene glycol monomethyl ether; Dowanol® 50B	C <sub>4</sub> H <sub>10</sub> O <sub>2</sub>	90	0.960	120		x						x	
Propylene imine [75-55-8]	2-Methylaziridine, 2-Methylethyleneimine, Propyleneimine, Propylene imine (inhibited), Propyleneimine	C <sub>3</sub> H <sub>7</sub> N	57	0.800	66		x						x	
Propylene oxide [75-56-9]	1,2-Epoxy propane; Methyl ethylene oxide; Methyloxirane; Propene oxide; 1,2-Propylene oxide	C <sub>3</sub> H <sub>6</sub> O	58	0.830	34		x						x	
n Propyl nitrate [627-13-4]	Propyl ester of nitric acid	C <sub>3</sub> H <sub>7</sub> NO <sub>3</sub>	105	1.070	111									Please call to discuss
Pyridine [110-86-1]	Azabenzene, Azine	C <sub>5</sub> H <sub>5</sub> N	70	0.980	115						x		x	
Quartz, see Silica — Crystalline	Cristobalite, Quartz, Tridymite, Tripoli		60		2230									x
Quinone [106-51-4]	1,4-Benzoquinone; p-Benzoquinone; 1,4-Cyclohexadiene dioxide; p-Quinone	C <sub>6</sub> H <sub>4</sub> O <sub>2</sub>	108	1.320										Please call to discuss
Rhodium [7440-16-6] Metal Insoluble compounds, as Rh Soluble compounds, as Rh	Rhodium metal; Elemental rhodium	Rh	103 (Varies) (Varies)					x					x	x
Selenium [7782-49-2] and compounds, as Se	Elemental selenium, Selenium alloy	Se	79	4.280	690									x
Selenium hexafluoride [7783-79-1], as Se	Selenium fluoride	F <sub>6</sub> Se	193	0.008	-25									NR

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Silicon [7440-21-3]	Elemental silicon [Note: Does not occur free in nature, but is found in silicon dioxide (silica) & in various silicates]	H <sub>2</sub> Si	28	2.330	2600									×
Silicon carbide [409-21-2]	Carbon silicide; Carborundum®; Silicon monocarbide	CSi	40	3.230										×
Silicon tetrahydride [7803-62-5]	Monosilane, Silane, Silicane	H <sub>2</sub> Si	32	0.003	-112						NR			
Silver [7440-22-4] Metal Soluble compounds, as Ag	Silver metal: Argentum	Ag	108 (Varies)											×
Soapstone Total particulate Respirable particulate	Massive talc, Soapstone silicate, Steatite	H <sub>2</sub> Mg <sub>3</sub> O <sub>12</sub> Si <sub>4</sub>												×
Sodium azide [26628-22-8] as Sodium azide as Hydrazoic acid vapor	Azide, Azium, Sodium salt of hydrazoic acid	N <sub>3</sub> Na	65								NR			
Sodium bisulfite [7631-90-5]	Monosodium salt of sulfurous acid, Sodium acid bisulfite, Sodium bisulphite, Sodium hydrogen sulfite	HNaO <sub>3</sub> S	104											×
Sodium fluoroacetate [62-74-8]	SFA, Sodium monofluoroacetate	C <sub>2</sub> H <sub>2</sub> FNaO <sub>2</sub>	100											×
Sodium hydroxide [1310-73-2]	Caustic soda, Lye, Soda lye, Sodium hydrate	HNaO	40											×
Sodium metabisulfite [7681-57-4]	Disodium pyrosulfite, Sodium metabisulphite, Sodium pyrosulfite	<sub>2</sub> Na <sub>2</sub> O <sub>5</sub> S <sub>2</sub>	190											×
Stearates(I)		C <sub>18</sub> H <sub>35</sub> NO <sub>2</sub>	(Varies)											×
Stibine [7803-52-3]	Antimony hydride, Antimony trihydride, Hydrogen antimonide	H <sub>3</sub> Sb	125								NR			
Stoddard solvent [8052-41-3]	t, Mineral spirits, Petroleum solvent, Spotting naphtha		140	0.780	220		×						×	
Strontium chromate [7789-06-2], as Cr		CrO <sub>4</sub> Sr	204								NR			
Styrene, monomer [100-42-5]	Ethenyl benzene, Phenylethylene, Styrene monomer, Styrol, Vinyl benzene	C <sub>6</sub> H <sub>6</sub>	104	0.910	146		×						×	
Sulfur dioxide [7446-09-5]	Sulfurous acid anhydride, Sulfurous oxide, Sulfur oxide	O <sub>2</sub> S	64	0.003	-10									
Sulfur hexafluoride [2551-62-4]	Sulfur fluoride	F <sub>6</sub> S	146	0.006							NR			
Sulfuric acid [7664-93-9]	Battery acid, Hydrogen sulfate, Oil of vitriol, Sulfuric acid (aqueous)	H <sub>2</sub> O <sub>4</sub> S	98	1.840	296			×					×	
Sulfur monochloride [10025-67-9]	Sulfur chloride, Sulfur subchloride, Thiosulfurous dichloride	Cl <sub>2</sub> S <sub>2</sub>	135								NR			
Sulfur pentafluoride [5714-22-7]	Disulfur decafluoride, Sulfur decafluoride	F <sub>10</sub> S <sub>2</sub>	254	0.011	29						NR			
Sulfur tetrafluoride [7783-60-0]	Tetrafluorosulfurane	F <sub>4</sub> S	108	0.005	-40						NR			
Sulfuryl fluoride [2699-79-8]	Sulfur difluoride dioxide, Vikane®	F <sub>2</sub> O <sub>2</sub> S	102	0.004	-55						NR			
Sulprofos [35400-43-2]	Bolstar®, O-Ethyl O-(4-methylthio)phenyl S-propylphosphorodithioate	C <sub>12</sub> H <sub>19</sub> O <sub>2</sub> PS <sub>3</sub>	322								NR			
Talc (containing no asbestos fibers) [14807-96-6]	Hydrous magnesium silicate, Steatite talc	H <sub>2</sub> Mg <sub>3</sub> O <sub>12</sub> Si <sub>4</sub>												×
Talc (containing asbestos fibers)		H <sub>2</sub> Mg <sub>3</sub> O <sub>12</sub> Si <sub>4</sub>												×
TEDP, see Sulfotep	Bladafum®, Dithion®, Sulfotep, Tetraethyl dithionopyrophosphate, Tetraethyl dithiopyrophosphate, Thiolepp	C <sub>8</sub> H <sub>20</sub> O <sub>5</sub> P <sub>2</sub> S <sub>2</sub>									NR			
Tellurium [13494-80-9] and compounds, except hydrogen telluride, as Te	Aurum paradoxum, Metallum problematum	Te	128	6.240	990									×
Tellurium hexafluoride [7783-80-4]	Tellurium fluoride	F <sub>6</sub> Te	242	0.010							NR			

CHEMICAL REFERENCE LIST		SUBSTANCE CHARACTERISTICS					RECOMMENDED FILTER TYPE							
Substance [CAS No.]	Synonyms	Chemical Formula	Mol. Weight (MW)	Specific Gravity (SG)	Boiling Point (Bp °C)	Melting Point (Mp °C)	GP Plus!	ACI Plus/ SUL	ACR	ACM	AMM	FOR	EDU	HEPA / ULPA
TEPP [107-49-3]	Ethyl pyrophosphate, Tetraethyl pyrophosphate, Tetron®	C <sub>8</sub> H <sub>20</sub> O <sub>7</sub> P <sub>2</sub>	290											NR
1,1,2,2 Tetrachloro-1,2-difluoroethane [76-12-0]		C <sub>2</sub> Cl <sub>4</sub> F <sub>2</sub>	204	1.650	92									Please call to discuss
1,1,2,2 Tetrachloroethane [79-34-5]		C <sub>2</sub> H <sub>2</sub> Cl <sub>4</sub>	168	1.590	146		x						x	
Tetrachloronaphthalene [1335-88-2]	Halowax®, Nibren wax, Seekay wax	C <sub>10</sub> H <sub>4</sub> Cl <sub>4</sub>	266		331									Please call to discuss
Tetraethyl lead [78-00-2], as Pb	Lead tetraethyl, TEL, Tetraethylplumbane	C <sub>8</sub> H <sub>20</sub> Pb	323	1.650	100									Please call to discuss
Tetrahydrofuran [109-99-9]	Diethylene oxide; 1,4-Epoxybutane; Tetramethylene oxide; THF	C <sub>4</sub> H <sub>8</sub> O	72	0.890	65		x						x	
Tetranitromethane [509-14-8]	Tetan, TNM	CN <sub>4</sub> O <sub>8</sub>	196	1.620	126									NR
Tetryl [479-45-8]	N-Methyl-N,2,4,6-tetranitroaniline; Nitramine; 2,4,6-Tetryl; 2,4,6-Trinitrophenyl-N-methylnitramine	C <sub>7</sub> H <sub>5</sub> N <sub>6</sub> O <sub>8</sub>	287	1.570	187									NR
Thallium, elemental [7440-28-0], and soluble compounds, as TI	Synonyms vary depending upon the specific soluble thallium compound		204 (Varies)		1457									x
4,4 Thiobis(6-tert-butyl-m-cresol) [96-69-5]		C <sub>22</sub> H <sub>30</sub> O <sub>2</sub> S	359	1.100		150								Please call to discuss
Thioglycolic acid [68-11-1]	Acetyl mercaptan, Mercaptoacetate, Mercaptoacetic acid, 2-Mercaptoacetic acid, 2-Thioglycolic acid, Thiovanic acid	C <sub>2</sub> H <sub>4</sub> O <sub>2</sub> S	92											NR
Thionyl chloride [7719-09-7]	Sulfinyl chloride, Sulfur chloride oxide, Sulfurous dichloride, Sulfurous oxychloride, Thionyl dichloride	Cl <sub>2</sub> OS	119											
Tin [7440-31-5] Metal Oxide & inorganic compounds, except tin hydride, as Sn Organic compounds, as Sn			119  (Varies) (Varies)											x
Titanium dioxide [13463-67-7]	Rutile, Titanium oxide, Titanium peroxide	O <sub>2</sub> Ti	80	4.600		1860								x
Toluene [108-88-3]	1-Methyl-2,4,6-Trinitrobenzene; TNT; Trinitrotoluene; sym-Trinitrotoluene; Trinitrotoluol	C <sub>7</sub> H <sub>8</sub>	92	0.870	110		x						x	
Toluene-2,4-diisocyanate (TDI) [584-84-9]		C <sub>9</sub> H <sub>6</sub> N <sub>2</sub> O <sub>2</sub>	174	1.220	251									NR
Toluidine [95-53-4]	3-Amino-1-methylbenzene, 1-Aminophenylmethane, m-Aminotoluene, 3-Methylaniline, 3-Methylbenzenamine, 3-Toluidine, m-Tolylamine	C <sub>7</sub> H <sub>7</sub> N	107		200									Please call to discuss
1,2,4 Trichlorobenzene [120-82-1]		C <sub>6</sub> H <sub>3</sub> Cl <sub>3</sub>	181	1.450	213									Please call to discuss
1,1,2 Trichloroethane [79-00-5]		C <sub>2</sub> H <sub>3</sub> Cl <sub>3</sub>	133	1.440	114		x						x	
Trichloroethylene [79-01-6]	Ethylene trichloride, TCE, Trichloroethene, Trilene	C <sub>2</sub> HCl <sub>3</sub>	131	1.460	86		x						x	
Trichlorofluoromethane [75-69-4]	Freon® 11; Monofluorotrichloromethane; Refrigerant 11; Trichlorofluoromethane; Trichloromonofluoromethane	CCl <sub>3</sub> F	137											
1,2,3 Trichloropropane [96-18-4]		C <sub>3</sub> H <sub>5</sub> Cl <sub>3</sub>	147	1.390	142		x						x	
Triethylamine [121-44-8]	TEA		101	0.730	90		x						x	
Trifluoromethane [75-63-8]			149											NR
Trimellitic anhydride [552-30-7]	1,2,4-Benzenetricarboxylic anhydride; 4-Carboxyphthalic anhydride; TMA; TMAN; Trimelic acid anhydride	C <sub>9</sub> H <sub>4</sub> O <sub>5</sub>	192											NR
Trimethylamine [75-50-3]	N,N-Dimethylmethanamine; TMA	C <sub>12</sub> H <sub>18</sub> O <sub>4</sub>	59	0.003	-4									NR
Trimethyl benzene (mixed isomers) [25551-13-7]		C <sub>9</sub> H <sub>12</sub>	120		176		x						x	
Trimethyl phosphite [121-45-9]	Methyl phosphite, Trimethoxyphosphine, Trimethyl ester of phosphorous acid	C <sub>3</sub> H <sub>7</sub> O <sub>3</sub> P	124	1.050	108									NR



CHEMICAL REFERENCE LIST		SUBSTANCE CHARACTERISTICS					RECOMMENDED FILTER TYPE							
Substance [CAS No.]	Synonyms	Chemical Formula	Mol. Weight (MW)	Specific Gravity (SG)	Boiling Point (Bp °C)	Melting Point (Mp °C)	GP Plus!	ACI Plus/ SUL	ACR	ACM	AMM	FOR	EDU	HEPA / ULPA
Trinitrotoluene (TNT) [118-96-7]	1-Methyl-2,4,6-trinitrobenzene; TNT; Trinitrotoluene; sym-Trinitrotoluene; Trinitrotoluol	C <sub>7</sub> H <sub>5</sub> N <sub>3</sub> O <sub>6</sub>	227	1.650										NR
Triorthocresyl phosphate [78-30-8]	TCP, TOCP, Tri-o-cresyl ester of phosphoric acid, Tri-o-cresyl phosphate	C <sub>21</sub> H <sub>21</sub> O <sub>4</sub> P	368	1.200	410									Please call to discuss
Triphenyl amine [603-34-9]		C <sub>18</sub> H <sub>15</sub> N	245	0.770	365									Please call to discuss
Tungsten [7440-33-7], as W Metal and insoluble compounds Soluble compounds	Tungsten metal, Wolfram	W	184 (Varies) (Varies)	19.300										x
Turpentine [8006-64-2]	Gumspirits, Gum turpentine, Spirits of turpentine, Steam distilled turpentine, Sulfate wood turpentine, Turps, Wood turpentine		136	0.860	154		x						x	
Urea (57-13-6)		CH <sub>4</sub> N <sub>2</sub> O					x						x	
Uric Acid (69-93-2)		C <sub>5</sub> H <sub>4</sub> N <sub>4</sub> O <sub>3</sub>	168				x						x	
Uranium (natural) [7440-61-1] Soluble and insoluble compounds, as U	Uranium metal; Uranium I Synonyms of other insoluble uranium compounds vary depending upon the specific compound	U	238 (Varies)											x
Vanadium pentoxide [1314-62-1], as V205 Respirable dust or fume	Divanadium pentoxide dust, Vanadic anhydride dust, Vanadium oxide dust, Vanadium pentoxide dust	O <sub>5</sub> V <sub>2</sub>	182					x						x
Vegetable oil mists		—					x						x	x
Vinyl acetate [108-05-4]	1-Acetoxyethylene, Ethenyl acetate, Ethenyl ethanoate, VAC, Vinyl acetate monomer, Vinyl ethanoate	C <sub>4</sub> H <sub>6</sub> O <sub>2</sub>	86	0.930	73		x						x	
Vinyl bromide [593-60-2]	Bromoethene, Bromoethylene, Monobromoethylene	C <sub>2</sub> H <sub>3</sub> Br	107	0.005	16									Please call to discuss
Vinyl chloride [75-01-4]	Chloroethene, Chloroethylene, Ethylene monochloride, Monochloroethene, Monochloroethylene, VC, Vinyl chloride monomer (VCM)	C <sub>2</sub> H <sub>3</sub> Cl	63	0.003	-14							x		
Vinyl fluoride [75-02-5]	Fluoroethene, Fluoroethylene, Monofluoroethylene, Vinyl fluoride monomer	C <sub>2</sub> H <sub>3</sub> F	46		0	-72								Please call to discuss
Vinylidene chloride [75-35-4]	1,1-DCE; 1,1-Dichloroethene; 1,1-Dichloroethylene; VDC; Vinylidene chloride monomer; Vinylidene dichloride	C <sub>2</sub> H <sub>2</sub> Cl <sub>2</sub>	97	1.210	37									Please call to discuss
Vinylidene fluoride [75-38-7]	Difluoro-1,1-ethylene; 1,1-Difluoroethene; 1,1-Difluoroethylene; Halocarbon 1132A; VDF; Vinylidene difluoride	C <sub>2</sub> H <sub>2</sub> F <sub>2</sub>	64	0.003	-83									Please call to discuss
Vinyl toluene [25013-15-4]	Ethenylmethylbenzene, Methylstyrene, Tolyethylene	C <sub>27</sub> H <sub>30</sub>	118	0.890	170		x						x	
VM & P Naphtha [8032-32-4]	Ligroin, Painters naphtha, Petroleum ether, Petroleum spirit, Refined solvent naphtha, Varnish makers' & painters' naphtha	C <sub>7</sub> H <sub>8</sub> BrMg	114		80									Please call to discuss
Warfarin [81-81-2]	3-(alpha-Acetyonyl)-benzyl-4-hydroxycoumarin, 4-Hydroxy-3-(3-oxo-1-phenyl butyl)-2H-1-benzopyran-2-one, WARF	C <sub>19</sub> H <sub>16</sub> O <sub>4</sub>	308		161									Please call to discuss
Welding fumes							x						x	x
Wood dust (Certain hard woods as beech & oak) Soft wood														x
Xylene [1330-20-7]	1,3-Dimethylbenzene; meta-Xylene; m-Xylol	C <sub>8</sub> H <sub>10</sub>	106	0.860	138		x						x	
Xylidine (mixed isomers) [1300-73-8]	Aminodimethylbenzene, Aminoxylene, Dimethylaminobenzene, Dimethylaniline, Xylidine isomers (e.g., 2,4-Dimethylaniline)	C <sub>48</sub> H <sub>68</sub> N <sub>6</sub>	121	0.980	213		x						x	
Yttrium [7440-65-5], metal and compounds, as Y	Yttrium metal	C <sub>39</sub> H <sub>91</sub> O <sub>12</sub> Y <sub>5</sub>	89	4.470										x
Zinc chloride fume [7646-85-7]	Zinc dichloride fume	Cl <sub>2</sub> Zn	136					x						
Zinc chromates [13530-65-9; 11103-86-9; 37300-23-5], as Cr			(Varies)											x
Zinc oxide [1314-13-2] Dust	Zinc peroxide	OZn	81	5.610										x
Zirconium [7440-67-7] and compounds, as Zr	Zirconium metal; Zirconium	C <sub>6</sub> H <sub>20</sub> O <sub>4</sub> Zr	91	6.510										x



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