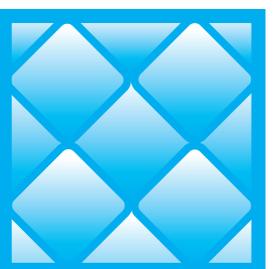


Chemical Guide *for*

Carbon Filtered Enclosures



CAUTION

THIS GUIDE SHOULD ONLY BE USED AS SUPPORTING REFERENCE IN THE DETERMINATION OF A CHEMICAL'S SAFE USE WITH LABCONCO'S CARBON FILTERED ENCLOSURE. VARIABLES IN CONCENTRATION, TEMPERATURES, PHASES AND REACTIONS WITH OTHER CHEMICALS CONTRIBUTE TO UNCERTAINTY. A THOROUGH ANALYSIS BY THE ON-SITE TRAINED CHEMICAL SAFETY OFFICER MUST BE DONE FOR EACH APPLICATION.

The data included in the Chemical Guide has been compiled from current public sources. The chemicals listed are those included in the U.S. National Institute for Occupational Safety and Health (NIOSH) Pocket Guide to Chemical Hazards, 2005. The general recommendations for "Compatibility" of each chemical are an opinion, based on the analysis of available data for chemical properties, exposure limits, odor and filter effectiveness.

New information with the respect to chemical hazards is adopted on a continual basis. Information contained in this Chemical Guide may become dated and therefore reinforces the need to research appropriateness for use at the start and at regular intervals. For an on-line version of this guide, that is regularly updated, visit www.labconco.com/chemicalguide. "Exposure Limits" documented in the Chemical Guide are for reference only, therefore consult the latest regulatory limits that apply to your location and industry.

Where the Paramount® Ductless Enclosure or any of Labconco's other carbon-filtered enclosures are used with hazardous chemicals, a formal Chemical Hygiene program must be established. The program should include education, training and maintenance to ensure the proper application, use and performance of the product. Appropriate personal protection clothing, gloves and eye wear along with proper handling of chemicals in fume hoods are the responsibility of the user and their employer.

DUCTLESS ENCLOSURES WILL NOT PROTECT AGAINST ALL CHEMICALS IN THE WORK ENVIRONMENT. SPECIFIC LIMITATIONS STATED IN THE USER'S MANUAL MUST BE FULLY REVIEWED AND UNDERSTOOD BEFORE USE. FAILURE TO HEED THE WARNINGS MAY RESULT IN SICKNESS OR DEATH.

How to Use this Chemical Guide

This guide is designed to provide chemical specific data to assist in determining the suitability of ductless filtration for your application. This Chemical Guide is not an approved list of chemicals, but a tool to help determine suitability. You and your safety officer must ultimately determine which chemicals and what quantities to ensure your personal safety.

Chart Key

Chemical Name

The chemical name found in the Occupational Safety and Health Administration (OSHA) General Industry Air Contaminants Standard and National Institute for Occupational Safety and Health (NIOSH) Pocket Guide is listed in this column.

CAS No.

This column lists the Chemical Abstracts Service registry number. The CAS number is unique for each chemical and allows for efficient searching on computerized databases.

Synonyms

This column contains an alphabetical list of common synonyms and trade names for each chemical.

Chemical Compatibility

The chemicals have icons indicating their compatibility with ductless filtration. Every application should be thoroughly evaluated by your safety officer.

- Generally Compatible
- Pay attention to the Warnings and Notes.
- Not Recommended. Do not use.

United States Exposure Limits

NIOSH

The NIOSH recommended exposure limits (RELs) are listed first in this section. This guide references the NIOSH publication No. 2005-149 published in September 2007.

The TWA indicates a time-weighted average concentration for up to a 10-hour workday during a 40-hour week.

An “ST” preceding the value represents a short term exposure limit (STEL). The (STEL) is a 15-minute TWA exposure that should not be exceeded at any time during a workday, unless noted otherwise.

A “C” preceding the value represents a ceiling REL. Unless noted otherwise, the ceiling value should not be exceeded at any time.

A “Ca” preceding the value represents a substance A NIOSH considers a potential occupational carcinogen.

OSHA

The OSHA permissible exposure limits (PELs) are listed second in this section. This guide references the values found in the OSHA General Industry Air Contaminants Standard (29 CFR 1910.1000) that were made effective July 1, 1993, and which are currently enforced by OSHA.

The TWA (time-weighted average) concentrations for OSHA PELs must not be exceeded during any 8-hour work shift of a 40-hour workweek.

An “ST” preceding the value represents a short term exposure limit (STEL). The (STEL) is a 15-minute TWA exposure that should not be exceeded at any time during a workday, unless noted otherwise.

A “C” preceding the value represents an OSHA ceiling concentration that should not be exceeded during any time of the workday. If instantaneous monitoring is not feasible, the ceiling must be assessed as a 15 minute TWA exposure.

Odor Threshold

Odor Threshold is the lowest concentration, in ppm, of a chemical in the air that is detectable by smell. The odor threshold should only be regarded as an estimate. Odor thresholds are commonly determined under controlled laboratory conditions using people trained in odor recognition. Since odor thresholds vary widely from person to person, you should not depend solely on odor for determining filter saturation. Some solvents produce “olfactory fatigue” – rapid loss of ability to smell the odor over a period of time.

Filter Capacity

The Filter Capacity value is the theoretical adsorption capacity of the filter provided by the activated carbon manufacturers. It is listed as a percentage of the filter weight at a 10 ppm evaporative concentration. Concentrations higher than 10 ppm have higher filter capacities and concentrations lower than 10ppm have lower filter capacities.

Example: The theoretical Filter Capacity for Toluene with an inlet concentration of 10ppm is: 20.1%.

Paramount Width	Weight of Carbon in Filters	Theoretical Weight of Toluene Adsorbed
2ft	15 lbs. (6.75 kg)	3 lbs. (1.35 kg)
3ft	30 lbs. (13.5 kg)	6 lbs. (2.7 kg)
4ft	45 lbs. (20.25 kg)	9 lbs. (4.1 kg)
5ft	45 lbs. (20.25 kg)	9 lbs. (4.1 kg)
6ft	60 lbs. (27 kg)	12 lbs (5.4 kg)

Humidity, temperature, inlet concentration and the presence of other chemicals are just a few of the factors that influence carbon adsorption and thus the filter capacity of the filters. These values presented are theoretical and can vary depending on your application.

To determine the specific filter life of a chemical filter, refer to the user's manual for your Labconco enclosure.

Filter Type

Filter Type is the recommended carbon or HEPA filter appropriate for the corresponding chemical. Some of the other carbon- filtered enclosures do not have as many filter types available. Please reference their user's manual for more specific information.

OV	Organic Vapor Filter
HEPA	HEPA (High Efficiency Particulate Air) Filter
AG	Acid Gas/Sulfur Filter
FORM	Formaldehyde Filter
AM	Ammonia/Amines Filter
MB	Mixed Bed Filter
RAID	Radioisotope Filter [For radioisotopes of Iodine only. For other radioisotopes please see your safety officer.]

Warnings

This section lists specific circumstances that should be acknowledged and considered before using that chemical in a Labconco Carbon Filtered Enclosure.

Carcinogen

Chemical is known or suspected to be a carcinogen

Exposure Limit Not Established

Exposure limits have not been established by NIOSH or OSHA.

Low Odor Threshold

Odor threshold is less than 0.1ppm. Since

odor is so strong, extremely low concentrations in the room may be objectionable.

Poor Odor Warning

The odor threshold is higher than the exposure limit. Exposure limits are exceeded before chemicals can be detected by smell.

Short Filter Life

The filter capacity is 1% or less.

Unknown Odor Threshold

An odor threshold has not been established for the chemical.

Unknown Filter Effectiveness

The filter capacity is unknown and the chemical should only be used in quantities below the exposure limit.

Notes

Special comments or information pertinent to the specific chemicals are listed here.

Working with Vaporious Chemicals

Criteria for Suitability

1. Is the chemical stable and safe to handle at operating conditions? (Flammability, explosiveness, reactivity, etc.) Consult a Chemical Safety Officer.
2. Has the chemical been shown to be adsorbed or neutralized effectively by the carbon media? Consult published data or Labconco Specialists.
3. Are the exposure limits known? Given the amount of chemical to be released within the enclosure, is it reasonably safe (with a safety factor) if the filter experiences breakthrough during a chemical operation? Review with a Chemical Safety Officer.

Minimizing Risk

1. Work with the smallest amounts of chemical possible and prevent unnecessary evaporation by keeping containers closed.
2. Always work with concentrations below the exposure limit for the chemical.
3. Know your filter condition. Monitor the exhaust with the Safety-First™ Vapor Sensor, detection tubes and your senses. If any of those three indicate potential breakthrough of the filter, replace the filter at that time. **DO NOT ASSUME THERE IS A PERIOD OF TIME WHERE THE FILTER IS PARTIALLY EFFECTIVE! CARBON FILTERS ARE TO BE REPLACED AT THE FIRST SIGN OF BREAKTHROUGH OR SATURATION.**
4. The air exchanges within the room must exceed the exhaust output of the enclosure. Failure to ensure this condition can lead to an accumulation of chemical vapors in the event of an unmonitored breakthrough.

Example: Paramount Ductless Enclosure

Unit Size	Sash Opening	Airflow (cfm) at 80 fpm
2ft	9.4 in	115
3ft	9.4 in	175
3ft	12 in	230
4ft	9.4 in	235
4ft	12 in	305
5ft	9.4 in	295
6ft	12 in	465

Activated Carbon (OV) Filter Adsorption Capacities

A common misunderstanding regarding the capacity of activated carbon is that it adsorbs a predictable fixed weight of chemicals. Chemical adsorption is a result of the chemical concentration in the airstream attempting to reach equilibrium with the carbon media. The ultimate capacity of the activated carbon will increase significantly as the concentration goes higher. For example:

Percent-by-weight theoretical adsorptions for Chloroform (CHCl₃):

	@ 10 ppm	@ 100 ppm	@ 1000 ppm
% adsorbed/wt. of carbon	10.2	20.1	35.5

Based on physical and thermodynamic properties, mathematical equations have been developed to predict the adsorption of volatile organic compounds (VOC's). The "Filter Capacity" provided in the Chemical Guide for OV filters are formula derived values for chemical concentrations in 10 ppm airstream. Use these capacity values as a relative measure of the filter effectiveness with the understanding that exact weight will vary with temperature, humidity, distribution across the media and chemical combinations.

CHEMICAL NAME	CAS No.	Synonyms		United States Exposure Limits (TWA) NIOSH	United States Exposure Limits (TWA) OSHA	Odor Threshold (ppm)	Filter Capacity (% weight @ 10ppm)	Filter Type	Warnings	Notes
Acetaldehyde	75-07-0	Acetic aldehyde, Ethanal, Ethyl aldehyde		Ca	200 ppm (360 mg/m ³)	0.186	0.3	OV	Carcinogen Short Filter Life	Closed containers exposed to heat may explode. Boiling point 69°F.
Acetic acid	64-19-7	Acetic acid (aqueous), Ethanoic acid, Glacial acetic acid (pure compound), Methanecarboxylic acid [Note: Can be found in concentrations of 5-8% in vinegar.]		10 ppm (25 mg/m ³) ST 15 ppm (37 mg/m ³)	10 ppm (25 mg/m ³)	0.016	3.7	OV	Low Odor Threshold	
Acetic anhydride	108-24-7	Acetic acid anhydride, Acetic oxide, Acetyl oxide, Ethanoic anhydride		C 5 ppm (20 mg/m ³)	5 ppm (20 mg/m ³)	0.029	22.3	OV	Low Odor Threshold	
Acetone	67-64-1	Dimethyl ketone, Ketone propane, 2-Propanone		250 ppm (590 mg/m ³)	1000 ppm (2400 mg/m ³)	4.58	2	OV		
Acetone cyanohydrin	75-86-5	Cyanohydrin-2-propanone, 2-Cyano-2-propanol, alpha-Hydroxyisobutyronitrile, 2-Hydroxy-2-methyl-propionitrile, 2-Methylactonitrile		C 1 ppm (4 mg/m ³) [15-minute]	None	3	0.001	Not recommended	Short Filter Life Poor Odor Warning	Decomposes to acetone and hydrogen cyanide (HCN) at room temperatures. HCN has an extremely short filter life.
Acetonitrile	75-05-8	Cyanomethane, Ethyl nitrile, Methyl cyanide [Note: Forms cyanide in the body.]		20 ppm (34 mg/m ³)	40 ppm (70 mg/m ³)	97.7	0.7	OV	Short Filter Life Poor Odor Warning	Use under exposure limit.
2-Acetylaminofluorene	53-96-3	AAF, 2-AAF, 2-Acetaminofluorene, N-Acetyl-2-aminofluorene, FAA, 2-FAA, 2-Fluorenylacetamide		Ca	Ca	Not established		HEPA	Carcinogen Exposure Limit Not Established Unknown Odor Threshold	
Acetylene	74-86-2	Ethine, Ethyne [Note: A compressed gas used in the welding & cutting of metals.]		C 2500 ppm (2662 mg/m ³)	None	565	0.035	Not recommended	Short Filter Life	
Acetylene tetrabromide	79-27-6	Symmetrical tetrabromoethane; TBE; Tetrabromoacetylene; Tetrabromoethane; 1,1,2,2-Tetrabromoethane		Not Established (NIOSH questioned TWA 1 ppm)	1 ppm (14 mg/m ³)	1	36	OV	Poor Odor Warning	Low exposure limit.
Acetylsalicylic acid	50-78-2	o-Acetoxybenzoic acid, 2-Acetoxybenzoic acid, Aspirin		5 mg/m ³	None	Not established		HEPA		
Acrolein	107-02-8	Acraldehyde, Acrylaldehyde, Acrylic aldehyde, Allyl aldehyde, Propenal, 2-Propenal		0.1 ppm (0.25 mg/m ³) ST 0.3 ppm (0.8 mg/m ³)	0.1 ppm (0.25 mg/m ³)	0.174	1.5	OV	Poor Odor Warning	Highly toxic. Use under exposure limit.
Acrylamide	79-06-1	Acrylamide monomer, Acrylic amide, Propenamide, 2-Propenamide		Ca TWA 0.03 mg/m ³ [skin]	0.3 mg/m ³ [skin]	Not established	37	OV/HEPA	Carcinogen Unknown Odor Threshold	Requires both filters. White odorless solid but may exist in both particulate and vapor phase.
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		2 ppm (6 mg/m ³) [skin]	None	0.4	14.8	OV		
Acrylonitrile	107-13-1	Acrylonitrile monomer, AN, Cyanoethylene, Propenenitrile, 2-Propenenitrile, VCN, Vinyl cyanide		Ca TWA 1 ppm C 10 ppm [15-minute] [skin]	2 ppm C 10 ppm [15-minute] [skin]	16.6	3.5	OV	Carcinogen Poor Odor Warning	
Adiponitrile	111-69-3	1,4-Dicyanobutane; Hexanedinitrile; Tetramethylene cyanide		4 ppm (18 mg/m ³)	None	Not established	53.7	OV	Unknown Odor Threshold	

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CHEMICAL NAME	CAS No.	Synonyms		United States Exposure Limits (TWA) NIOSH	United States Exposure Limits (TWA) OSHA	Odor Threshold (ppm)	Filter Capacity (% weight @ 10ppm)	Filter Type	Warnings	Notes
Aircraft Fuel	8008-20-6	Jet Fuel, Kerosene, Jet A (212110), Jet A-1 (212212), Jet A-1 (50) (212211), JP-8 (212130) Petroleum Distillate Fuel, Kerosene		Ca	Possible carcinogen.	Not established		OV/HEPA	Carcinogen Unknown Odor Threshold Unknown Filter Effectiveness	
Aldrin	309-00-2	1,2,3,4,10,10-Hexachloro-1,4,4a,5,8,8a-hexahydro-endo-1,4-exo-5,8-dimethanonaphthalene; HHDN; Octalene		Ca TWA 0.25 mg/m ³ [skin]	0.25 mg/m ³ [skin]	Not established		OV/HEPA	Carcinogen Unknown Odor Threshold Unknown Filter Effectiveness	Requires both filters. Solid with mild odor.
Allyl alcohol	107-18-6	1,4-Dicyanobutane; Hexanedinitrile; Tetramethylene cyanide		2 ppm (5 mg/m ³) ST 4 ppm (10 mg/m ³) [skin]	2 ppm (5 mg/m ³) [skin]	0.47	5.9	OV		
Allyl chloride	107-05-1	3-Chloropropene, 1-Chloro-2-propene, 3-Chloropropylene		1 ppm (3 mg/m ³) ST 2 ppm (6 mg/m ³)	1 ppm (3 mg/m ³)	0.489	10.2	OV		
Allyl glycidyl ether	106-92-3	AGE; 1-Allyloxy-2,3-epoxypropane; Glycidyl allyl ether; [(2-Propenyloxy) methyl] oxirane		5 ppm (22 mg/m ³) ST 10 ppm (44 mg/m ³) [skin]	C 10 ppm (45 mg/m ³)	Not established	18	OV	Unknown Odor Threshold	Liquid with pleasant odor.
Allyl propyl disulfide	2179-59-1	4,5-Dithia-1-octene; Onion oil; 2-Propenyl propyl disulfide; Propyl allyl disulfide		2 ppm (12 mg/m ³) ST 3 ppm (18 mg/m ³)	2 ppm (12 mg/m ³)	Not established		OV	Unknown Filter Effectiveness Unknown Odor Threshold	Liquid with onion-like odor. Use below exposure limit.
alpha-Alumina	1344-28-1	Alumina, Aluminum oxide, Aluminum trioxide [Note: alpha-Alumina is the main component of technical grade alumina. Corundum is natural Al ₂ O ₃ . Emery is an impure crystalline variety of Al ₂ O ₃ .]		Not established	15 mg/m ³ (total) TWA 5 mg/m ³ (resp)	Not established		HEPA		Odorless.
Aluminum	7429-90-5	Aluminium, Aluminum metal, Aluminum, Elemental aluminum		10 mg/m ³ (total) TWA 5 mg/m ³ (resp)	15 mg/m ³ (total) TWA 5 mg/m ³ (resp)	Not established		HEPA		Odorless metal.
Aluminum (pyro powders and welding fumes, as Al)				5 mg/m ³	None	Not established		HEPA		Odorless.
Aluminum (soluble salts and alkyls, as Al)				2 mg/m ³	None	Not established		HEPA		Odorless.
4-Aminodiphenyl	92-67-1	4-Aminobiphenyl, p-Aminobiphenyl, p-Aminodiphenyl, 4-Phenylaniline		Ca	OSHA-Regulated Carcinogens	Not established		HEPA	Carcinogen Exposure Limit Not Established	Colorless crystal with a floral odor.
2-Aminopyridine	504-29-0	alpha-Aminopyridine, alpha-Pyridylamine		0.5 ppm (2 mg/m ³)	0.5 ppm (2 mg/m ³)	Toxic concentrations may be achieved in air without an odor warning	13	OV/HEPA	Unknown Odor Threshold	Requires both filters.
Amitrole	61-82-5	Aminotriazole; 3-Aminotriazole; 2-Amino-1,3,4-triazole; 3-Amino-1,2,4-triazole		Ca TWA 0.2 mg/m ³	None	0.37-1.24 mg/m ³		OV/HEPA	Carcinogen Poor Odor Warning Unknown Filter Effectiveness	Requires both filters. Colorless white odorless crystalline.
Ammonia	7664-41-7	Anhydrous ammonia, Aqua ammonia, Aqueous ammonia [Note: Often used in an aqueous solution.]		25 ppm (18 mg/m ³) ST 35 ppm (27 mg/m ³)	50 ppm (35 mg/m ³)	5.0 ppm	10	AM		

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Ammonium chloride fume	12125-02-9	Ammonium chloride, Ammonium muriate fume, Sal ammoniac fume		10 mg/m ³ ST 20 mg/m ³	None	Not established		AM/HEPA	Unknown Odor Threshold Unknown Filter Effectiveness	Requires both filters.
Ammonium sulfamate	7773-06-0	Ammate herbicide, Ammonium amidosulfonate, AMS, Monoammonium salt of sulfamic acid, Sulfamate		10 mg/m ³ (total) TWA 5 mg/m ³ (resp)	15 mg/m ³ (total) TWA 5 mg/m ³ (resp)	Not established		AM/HEPA	Unknown Odor Threshold Unknown Filter Effectiveness	Requires both filters.
n-Amyl acetate	628-63-7	Amyl acetic ester, Amyl acetic ether, 1-Pentanol acetate, Pentyl ester of acetic acid, Primary amyl acetate		100 ppm (525 mg/m ³)	100 ppm (525 mg/m ³)	0.051	28.5	OV/HEPA	Low Odor Threshold	Requires both filters. Possible particulate in high humidity.
sec-Amyl acetate	626-38-0	1-Methylbutyl acetate, 2-Pentanol acetate, 2-Pentyl ester of acetic acid		125 ppm (650 mg/m ³)	125 ppm (650 mg/m ³)	0.002-0.8	31.3	OV/HEPA	Low Odor Threshold	Requires both filters. Possible particulate in high humidity.
Aniline (and homologs)	62-53-3	Aminobenzene, Aniline oil, Benzenamine, Phenylamine		Ca	5 ppm (19 mg/m ³) [skin]	0.676	15	OV	Carcinogen	
o-Anisidine	90-04-0	ortho-Aminoanisole, 2-Anisidine, o-Methoxyaniline [Note: o-Anisidine has been used as a basis for many dyes]		Ca TWA 0.5 mg/m ³ [skin]	0.5 mg/m ³ [skin]	Not established		OV/HEPA	Carcinogen Unknown Filter Effectiveness Unknown Odor Threshold	Requires both filters. Oily liquid.
p-Anisidine	104-94-9	para-Aminoanisole, 4-Anisidine, p-Methoxyaniline		TWA 0.5 mg/m ³ [skin]	TWA 0.5 mg/m ³ [skin]	Not established		OV/HEPA	Unknown Filter Effectiveness Unknown Odor Threshold	Requires both filters.
Antimony	7440-36-0	Antimony metal, Antimony powder, Stibium		0.5 mg/m ³ [*Note: The REL also applies to other antimony compounds (as Sb).]	0.5 mg/m ³ [*Note: The REL also applies to other antimony compounds (as Sb).]	Not established		HEPA		Crystals.
ANTU	86-88-4	alpha-Naphthyl thiocarbamide, 1-Naphthyl thiourea, alpha-Naphthyl thiourea		0.3 mg/m ³	0.3 mg/m ³	Not established		OV/HEPA	Exposure Limit Not Established Unknown Odor Threshold Poor Odor Warning	Requires both filters. Odorless. Rodenticide.
Arsenic (inorganic compounds, as As)	7440-38-2	Arsenic metal: Arsenia		Ca C 0.002 mg/m ³ [15-minute]	0.010 mg/m ³	Not established		AG/HEPA	Carcinogen Unknown Odor Threshold	Requires both filters.
Arsenic, organic compounds (as As)		Synonyms vary depending upon the specific organic arsenic compound		None	0.5 mg/m ³	Not established		HEPA		
Arsine	7784-42-1	Arsenic hydride, Arsenic trihydride, Arseniuretted hydrogen, Arsenous hydride, Hydrogen arsenide		Ca C 0.002 mg/m ³ [15-minute]	0.05 ppm (0.2 mg/m ³)	0.5		Not recommended	Carcinogen Poor Odor Warning Unknown Filter Effectiveness	Highly toxic gas.
Asbestos	1332-21-4	Actinolite, Actinolite asbestos, Amosite (cumingtonite-grunerite), Anthophyllite, Anthophyllite asbestos, Chrysotile, Crocidolite (Riebeckite), Tremolite, Tremolite asbestos		Ca	Ca			HEPA	Carcinogen Exposure Limit Not Established	Odorless solid.

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Asphalt fumes	8052-42-4	Asphalt: Asphaltum, Bitumen (European term), Petroleum asphalt, Petroleum bitumen, Road asphalt, Roofing asphalt		Ca C 5 mg/m ³ [15-minute]	None	Not established		OV/HEPA	Carcinogen Unknown Filter Effectiveness Unknown Odor Threshold	Requires both filters.
Atrazine	1912-24-9	2-Chloro-4-ethylamino-6-isopropylamino-s-triazine; 6-Chloro-N-ethyl-N'-(1-methylethyl)-1,3,5-triazine-2,4-diamine		5 mg/m ³	None	Not established		AG/HEPA	Unknown Odor Threshold Unknown Filter Effectiveness	Requires both filters. Odorless herbicide.
Azinphos-methyl	86-50-0	O,O-Dimethyl-S-4-oxo-1,2,3-benzotriazin-3(4H)-ylmethyl phosphorodithioate; Guthion®; Methyl azinphos		0.2 mg/m ³ [skin]	0.2 mg/m ³ [skin]	0.0002 mg/kg water		OV/HEPA	Unknown Filter Effectiveness	Requires both filters. Insecticide. Non combustible solid.
Barium chloride (as Ba)	10361-37-2	Barium dichloride		0.5 mg/m ³ [*Note: The REL also applies to other soluble barium compounds (as Ba) except Barium sulfate.]	0.5 mg/m ³ [*Note: The REL also applies to other soluble barium compounds (as Ba) except Barium sulfate.]	Not established		HEPA		Odorless solid.
Barium nitrate (as Ba)	10022-31-8	Barium dinitrate, Barium(II) nitrate (1:2), Barium salt of nitric acid		0.5 mg/m ³ [*Note: The REL also applies to other soluble barium compounds (as Ba) except Barium sulfate.]	0.5 mg/m ³ [*Note: The REL also applies to other soluble barium compounds (as Ba) except Barium sulfate.]	Not established		HEPA		Odorless solid.
Barium sulfate	7727-43-7	Artificial barite, Barite, Barium salt of sulfuric acid, Barytes (natural)		10 mg/m ³ (total) TWA 5 mg/m ³ (resp)	15 mg/m ³ (total) TWA 5 mg/m ³ (resp)	Not established		HEPA		Odorless.
Benomyl	17804-35-2	Methyl 1-(butylcarbamoyl)-2-benzimidazolecarbamate		Not Established	15 mg/m ³ (total) TWA 5 mg/m ³ (resp)	Not established		AG/HEPA	Unknown Odor Threshold Unknown Filter Effectiveness	Requires both filters. White solid with faint Odor. Fungicide.
Benzene	71-43-2	Benzol, Phenyl hydride		Ca TWA 0.1 ppm ST 1 ppm	1 ppm ST 5 ppm	8.65	11.9	OV	Poor Odor Warning Carcinogen	Monitor filters frequently. Change filters frequently.
Benzenethiol	108-98-5	Mercaptobenzene, Phenyl mercaptan, Thiophenol		C 0.1 ppm (0.5 mg/m ³) [15-minute]	None	0.062 mg/m ³		AG	Unknown Filter Effectiveness	Offensive Odor. Use under exposure limit.
Benzidine	92-87-5	Benzidine-based dyes; 4,4'-Bianiline; 4,4'-Biphenyldiamine; 1,1'-Biphenyl-4,4'-diamine; 4,4'-Diaminobiphenyl; p-Diaminodiphenyl [Note: Benzidine has been used as a basis for many dyes.]		Ca	None	Not established		AG/HEPA	Carcinogen Exposure Limit Not Established Unknown Odor Threshold Unknown Filter Effectiveness	Requires both filters. Poor odor warning
Benzoyl peroxide	94-36-0	Benzoperoxide, Dibenzoyl peroxide		5 mg/m ³	5 mg/m ³	Not established		OV/HEPA	Unknown Odor Threshold Unknown Filter Effectiveness	Requires both filters as vapor phase coexists sometimes with particulate.
Benzyl chloride	100-44-7	Chloromethylbenzene, alpha-Chlorotoluene		C 1 ppm (5 mg/m ³) [15-minute]	1 ppm (5 mg/m ³)	0.03	8.5	(AG or MB)/HEPA	Low Odor Threshold	Requires both filters as vapor phase exists sometimes. Contact with water produces toxic fumes. Incompatible with most metals and acids.

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CHEMICAL NAME	CAS No.	Synonyms		United States Exposure Limits (TWA) NIOSH	United States Exposure Limits (TWA) OSHA	Odor Threshold (ppm)	Filter Capacity (% weight @ 10ppm)	Filter Type	Warnings	Notes
Beryllium & beryllium compounds (as Be)	7440-41-7	Beryllium metal: Beryllium		Ca C 0.0005 mg/m ³	0.002 mg/m ³ C 0.005 mg/m ³ 0.025 mg/m ³ [30-minute maximum peak]	Not established		HEPA	Carcinogen Unknown Odor Threshold	
Bismuth telluride, doped with Selenium sulfide (as Bi ₂ Te ₃)				5 mg/m ³	None	Not established		HEPA		
Bismuth telluride, undoped	1304-82-1	Bismuth sesquioxide, Bismuth telluride, Bismuth tritelluride, Tellurobismuthite		10 mg/m ³ (total) TWA 5 mg/m ³ (resp)	15 mg/m ³ (total) TWA 5 mg/m ³ (resp)	Not established		HEPA		
Borates, tetra, sodium salts (Anhydrous)	1330-43-4	Anhydrous borax, Borax dehydrated, Disodium salt of boric acid, Disodium tetraborate, Fused borax, Sodium borate (anhydrous), Sodium tetraborate		1 mg/m ³	None	Not established		HEPA		
Borates, tetra, sodium salts (Decahydrate)	1303-96-4	Borax, Borax decahydrate, Sodium borate decahydrate, Sodium tetraborate decahydrate		5 mg/m ³	None	Not established		HEPA		
Borates, tetra, sodium salts (Pentahydrate)	12179-04-3	Borax pentahydrate, Sodium borate pentahydrate, Sodium tetraborate pentahydrate		1 mg/m ³	None	Not established		HEPA		
Boron oxide	1303-86-2	Boric anhydride, Boric oxide, Boron trioxide		10 mg/m ³	5 mg/m ³	Odorless		HEPA		
Boron tribromide	10294-33-4	Boron bromide, Tribromoborane		C 1 ppm (10 mg/m ³)	None			AG	Unknown Odor Threshold Unknown Filter Effectiveness	Colorless liquid. Use below exposure limit.
Boron trifluoride	7637-07-2	Boron fluoride, Trifluoroborane		C 1 ppm (3 mg/m ³)	C 1 ppm (3 mg/m ³)	1.5		Not recommended	Poor Odor Warning Unknown Filter Effectiveness	Colorless gas with suffocating odor.
Bromacil	314-40-9	5-Bromo-3-sec-butyl-6-methyluracil, 5-Bromo-6-methyl-3-(1-methylpropyl) uracil		1 ppm (10 mg/m ³)	None	Not established		HEPA	Unknown Odor Threshold	Odorless, colorless solid. Herbicide.
Bromine	7726-95-6	Molecular bromine		0.1 ppm (0.7 mg/m ³) ST 0.3 ppm (2 mg/m ³)	0.1 ppm (0.7 mg/m ³)	0.066	6.6	AG	Low Odor Threshold	Fuming liquid with irritating fumes; use under exposure limit.
Bromine pentafluoride	7789-30-2	Bromine fluoride		0.1 ppm (0.7 mg/m ³)	None	Not established		AG	Unknown Odor Threshold Unknown Filter Effectiveness	Fuming liquid. Use under exposure limit.
Bromoform	75-25-2	Methyl tribromide, Tribromomethane		0.5 ppm (5 mg/m ³) [skin]	0.5 ppm (5 mg/m ³) [skin]	0.447	6.9	OV		
1, 3-Butadiene	106-99-0	Biethylene, Biviny, Butadiene, Divinyl, Erythrene, Vinylethylene		Ca	1 ppm ST 5 ppm	0.455	2	OV	Carcinogen	Monitor Filter frequently. Colorless gas with a gasoline-like odor. Use small quantities only.
n-Butane	106-97-8	normal-Butane, Butyl hydride, Diethyl, Methylmethane [Note: Also see specific listing for Isobutane.]		800 ppm (1900 mg/m ³)	None	204	2.3	OV		Colorless gas. Use small quantities only. Monitor filters frequently.

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2-Butanone	78-93-3	Ethyl methyl ketone, MEK, Methyl acetone, Methyl ethyl ketone	☑	200 ppm (590 mg/m ³) ST 300 ppm (885 mg/m ³)	200 ppm (590 mg/m ³)	0.27	6.5	OV		
2-Butoxyethanol	111-76-2	Butyl Cellosolve®, Butyl oxitol, Dowanol® EB, EGBE, Ektasolve EB®, Ethylene glycol monobutyl ether, Jeffersol EB	⚠	5 ppm (24 mg/m ³) [skin]	50 ppm (240 mg/m ³) [skin]	0.001	35	OV	Low Odor Threshold	
2-Butoxyethanol acetate	112-07-2	tert-Butyl ester of acetic acid	⚠	5 ppm (33 mg/m ³)	None	Not established		OV	Unknown Filter Effectiveness Unknown Odor Threshold	Colorless liquid with fruity odor. Use under exposure limit.
n-Butyl acetate	123-86-4	Butyl acetate, n-Butyl ester of acetic acid, Butyl ethanoate	⚠	150 ppm (710 mg/m ³) ST 200 ppm (950 mg/m ³)	150 ppm (710 mg/m ³)	0.007	24.5	OV	Low Odor Threshold	
sec-Butyl acetate	105-46-4	sec-Butyl ester of acetic acid, 1-Methylpropyl acetate	☑	200 ppm (950 mg/m ³)	200 ppm (950 mg/m ³)	"3-7"	22.1	OV		
tert-Butyl acetate	540-88-5	tert-Butyl ester of acetic acid	☑	200 ppm (950 mg/m ³)	200 ppm (950 mg/m ³)	"4-47"	19.5	OV		
Butyl acrylate	141-32-2	n-Butyl acrylate, Butyl ester of acrylic acid, Butyl-2-propenoate	⚠	10 ppm (55 mg/m ³)	None	0.003	30.5	OV	Low Odor Threshold	
n-Butyl alcohol	71-36-3	1-Butanol, n-Butanol, Butyl alcohol, 1-Hydroxybutane, n-Propyl carbinol	⚠	C 50 ppm (150 mg/m ³) [skin]	100 ppm (300 mg/m ³)	0.03	15.4	OV	Low Odor Threshold	
sec-Butyl alcohol	78-92-2	2-Butanol, Butylene hydrate, 2-Hydroxybutane, Methyl ethyl carbinol	☑	100 ppm (305 mg/m ³) ST 150 ppm (455 mg/m ³)	150 ppm (450 mg/m ³)	1	10.7	OV		
tert-Butyl alcohol	75-65-0	2-Methyl-2-propanol, Trimethyl carbinol	☑	100 ppm (300 mg/m ³) ST 150 ppm (450 mg/m ³)	100 ppm (300 mg/m ³)	21.5	9.03	OV		
n-Butylamine	109-73-9	1-Aminobutane, Butylamine	⚠	C 5 ppm (15 mg/m ³) [skin]	C 5 ppm (15 mg/m ³) [skin]	0.053	1.8	AM	Low Odor Threshold	
tert-Butyl chromate	1189-85-1	di-tert-Butyl ester of chromic acid	⚠	Ca TWA 0.001 mg Cr(VI)/m ³	0.005 mg CrO ₃ /m ³ [skin]	Not established		OV/HEPA	Carcinogen Unknown Odor Threshold	Low Exposure Limit
n-Butyl glycidyl ether	2426-08-6	BGE; 1,2-Epoxy-3-butoxypropane	⚠	C 5.6 ppm (30 mg/m ³) [15-minute]	50 ppm (270 mg/m ³)	Not established	15.4	OV	Unknown Odor Threshold	
n-Butyl lactate	138-22-7	Butyl ester of 2-hydroxypropanoic acid, Butyl ester of lactic acid, Butyl lactate	☑	5 ppm (25 mg/m ³)	None	7.06	17.7	OV		
n-Butyl mercaptan	109-79-5	Butanethiol, 1-Butanethiol, n-Butanethiol, 1-Mercaptobutane	⚠	C 0.5 ppm (1.8 mg/m ³) [15-minute]	10 ppm (35 mg/m ³)	0.001	1.2	OV	Short Filter Life Low Odor Threshold	
o-sec-Butylphenol	89-72-5	2-sec-Butylphenol, 2-(1-Methylpropyl) phenol	⚠	5 ppm (30 mg/m ³) [skin]	None	Not established	15.9	OV	Unknown Odor Threshold	
p-tert-Butyltoluene	98-51-1	4-tert-Butyltoluene, 1-Methyl-4-tert-butylbenzene	☑	10 ppm (60 mg/m ³) ST 20 ppm (120 mg/m ³)	10 ppm (60 mg/m ³)	5.02	12.03	OV		

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n-Butyronitrile	109-74-0	Butanenitrile, Butyronitrile, 1-Cyanopropane, Propyl cyanide, n-Propyl cyanide		8 ppm (22 mg/m ³)	None	Not established	9.8	Not recommended	Unknown Odor Threshold Unknown Filter Effectiveness	Forms cyanide in the body.
Cadmium dust (as Cd)	7440-43-9	Cadmium metal: Cadmium		Ca [*Note: The REL applies to all Cadmium compounds (as Cd).]	0.005mg/m ³ [*Note: The PEL applies to all Cadmium compounds (as Cd).]	Not established		HEPA	Carcinogen	
Cadmium fume (as Cd)	1306-19-0	Cadmium monoxide, Cadmium oxide fume		Ca [*Note: The REL applies to all Cadmium compounds (as Cd).]	0.005mg/m ³ [*Note: The PEL applies to all Cadmium compounds (as Cd).]	Not established		HEPA	Carcinogen	
Calcium arsenate (as As)	7778-44-1	Calcium salt (2:3) of arsenic acid, Cucumber dust, Tricalcium arsenate, Tricalcium ortho-arsenate		Ca C 0.002 mg/m ³ [15-minute]	0.010 mg/m ³	Not established		HEPA	Carcinogen	
Calcium carbonate	1317-65-3	Calcium salt of carbonic acid		10 mg/m ³ (total) TWA 5 mg/m ³ (resp)	15 mg/m ³ (total) TWA 5 mg/m ³ (resp)	Not established		HEPA		
Calcium cyanamide	156-62-7	Calcium carbimide, Cyanamide, Lime nitrogen, Nitrogen lime		0.5 mg/m ³	None	Not established		HEPA		
Calcium hydroxide	1305-62-0	Calcium hydrate, Caustic lime, Hydrated lime, Slaked lime		5 mg/m ³	15 mg/m ³ (total) 5 mg/m ³ (resp)	Not established		HEPA		
Calcium oxide	1305-78-8	Burned lime, Burnt lime, Lime, Pebble lime, Quick lime, Unslaked lime		2 mg/m ³	5 mg/m ³	Not established		HEPA		
Calcium silicate	1344-95-2	Calcium hydrosilicate, Calcium metasilicate, Calcium monosilicate, Calcium salt of silicic acid		10 mg/m ³ (total) TWA 5 mg/m ³ (resp)	15 mg/m ³ (total) TWA 5 mg/m ³ (resp)	Not established		HEPA		
Calcium sulfate	7778-18-9	Anhydrous calcium sulfate, Anhydrous gypsum, Anhydrous sulfate of lime, Calcium salt of sulfuric acid [Note: Gypsum is the dihydrate form & Plaster of Paris is the hemihydrate form.]		10 mg/m ³ (total) TWA 5 mg/m ³ (resp)	15 mg/m ³ (total) TWA 5 mg/m ³ (resp)	Not established		HEPA		
Camphor (synthetic)	76-22-2	2-Camphonone, Gum camphor, Laurel camphor, Synthetic camphor		2 mg/m ³	2 mg/m ³	0.051		OV/HEPA	Unknown Filter Effectiveness Poor Odor Warning Low Odor Threshold	Requires both filters.
Caprolactam	105-60-2	Aminocaproic lactam, epsilon-Caprolactam, Hexahydro-2H-azepin-2-one, 2-Oxohexamethyleneimine		Dust: TWA 1 mg/m ³ ST 3 mg/m ³ Vapor: TWA 0.22 ppm (1 mg/m ³) ST 0.66 ppm (3 mg/m ³)	None	0.064		OV/HEPA	Unknown Filter Effectiveness Low Odor Threshold	Requires both filters.
Captafol	2425-06-1	Captafol; Difolatan®; N-((1,1,2,2-Tetrachloroethyl)thio)-4-cyclohexene-1,2-dicarboximide		Ca TWA 0.1 mg/m ³ [skin]	None	Not established		AG / HEPA	Carcinogen Unknown Odor Threshold Unknown Filter Effectiveness	Requires both filters. White crystalline solid with slight pungent odor. Fungicide.

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Captan	133-06-2	Captane; N-Trichloromethylmercapto-4-cyclohexene-1,2-dicarboximide		Ca TWA 5 mg/m ³	None	Not established		AG / HEPA	Carcinogen Unknown Filter Effectiveness Unknown Odor Threshold Poor Odor Warning	Requires both filters. Odorless white crystalline. NIOSH lists as a combustible solid. Fungicide.
Carbaryl	63-25-2	alpha-Naphthyl N-methyl-carbamate; 1-Naphthyl N-Methyl-carbamate; Sevin®		5 mg/m ³	5 mg/m ³	Not established		HEPA		
Carbofuran	1563-66-2	2,3-Dihydro-2,2-dimethyl-7-benzofuranyl methylcarbamate; Furacarb®; Furadan®		TWA 0.1 mg/m ³	None	Not established		AG / HEPA	Unknown Filter Effectiveness Unknown Odor Threshold	Requires both filters. Odorless white or grayish crystalline solid. Insecticide.
Carbon black	1333-86-4	Acetylene black, Channel black, Furnace black, Lamp black, Thermal black		TWA 3.5 mg/m ³ Ca TWA 0.1 mg PAHs/m ³ [Carbon black in presence of polycyclic aromatic hydrocarbons (PAHs)]	3.5mg/m ³	Not established		HEPA		
Carbon dioxide	124-38-9	Carbonic acid gas, Dry ice [Note: Normal constituent of air (about 300 ppm)].		5000 ppm (9000 mg/m ³) ST 30,000 ppm (54,000 mg/m ³)	5000 ppm (9000 mg/m ³)	74,000		Not recommended	Poor Odor Warning Unknown Filter Effectiveness	
Carbon disulfide	75-15-0	Carbon bisulfide		1 ppm (3 mg/m ³) ST 10 ppm (30 mg/m ³) [skin]	20 ppm C 30 ppm 100 ppm (30-minute maximum peak)	0.096	1.9	OV	Low Odor Threshold	
Carbon monoxide	630-08-0	Carbon oxide, Flue gas, Monoxide		35 ppm (40 mg/m ³) C 200 ppm (229 mg/m ³)	50 ppm (55 mg/m ³)	100,000		Not recommended	Poor Odor Warning Unknown Filter Effectiveness	
Carbon tetrabromide	558-13-4	Carbon bromide, Methane tetrabromide, Tetrabromomethane		0.1 ppm (1.4 mg/m ³) ST 0.3 ppm (4 mg/m ³)	None	Not established	20.8	OV	Unknown Odor Threshold	
Carbon tetrachloride	56-23-5	Carbon chloride; Carbon tet; Freon® 10; Halon® 104; Tetrachloromethane		Ca ST 2 ppm (12.6 mg/m ³) [60-minute]	10 ppm C 25 ppm 200 ppm (5-minute maximum peak in any 4 hours)	40.7	21.6	OV	Carcinogen Poor Odor Warning	
Carbonyl fluoride	353-50-4	Carbon difluoride oxide, Carbon fluoride oxide, Carbon oxyfluoride, Carbonyl difluoride, Fluoroformyl fluoride, Fluorophosgene		2 ppm (5 mg/m ³) ST 5 ppm (15 mg/m ³)	None	Not established		Not recommended	Unknown Odor Threshold Unknown Filter Effectiveness	
Catechol	120-80-9	1,2-Benzenediol; o-Benzenediol; 1,2-Dihydroxybenzene; o-Dihydroxybenzene; 2-Hydroxyphenol; Pyrocatechol		5 ppm (20 mg/m ³) [skin]	None	Not established		OV/ HEPA	Unknown Odor Threshold Unknown Filter Effectiveness	Requires both filters.
Cellulose	9004-34-6	Hydroxycellulose, Pyrocellulose		10 mg/m ³ (total) TWA 5 mg/m ³ (resp)	15 mg/m ³ (total) TWA 5 mg/m ³ (resp)	Not established		HEPA		
Cesium hydroxide	21351-79-1	Cesium hydrate, Cesium hydroxide dimer		2 mg/m ³	None	Not established		HEPA		

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Chlordane	57-74-9	Chlordan; Chlordano; 1,2,4,5,6,7,8,8-Octachloro-3a,4,7,7a-tetrahydro-4,7-methanoindane		Ca TWA 0.5 mg/m ³ [skin]	0.5 mg/m ³ [skin]	Not established		OV	Carcinogen Unknown Odor Threshold Unknown Filter Effectiveness	Viscous liquid with a chlorine-like odor.
Chlorinated camphene	8001-35-2	Chlorocamphene, Octachlorocamphene, Polychlorocamphene, Toxaphene		Ca	0.5 mg/m ³ [skin]	2.36 mg/m ³		OV	Carcinogen Poor Odor Warning Unknown Filter Effectiveness	Amber waxy solid with a mild piney chlorine and camphor-like odor. Insecticide.
Chlorinated diphenyl oxide		Synonyms depend on the degree of chlorination of diphenyl oxide [(C ₆ H ₅) ₂ O], ranging from monochlorodiphenyl oxide [(C ₆ H ₄ Cl)O(C ₆ H ₅)] to decachlorodiphenyl oxide [(C ₆ Cl ₅)O(C ₆ Cl ₅)].		0.5 mg/m ³	0.5 mg/m ³	Not established		OV/HEPA	Unknown Odor Threshold Unknown Filter Effectiveness	Requires both filters.
Chlorine	7782-50-5	Molecular chlorine		C 0.5 ppm (1.45 mg/m ³) [15-minute]	C 1 ppm (3 mg/m ³)	0.05	6.6	AG	Low Odor Threshold	
Chlorine dioxide	10049-04-4	Chlorine oxide, Chlorine peroxide		0.1 ppm (0.3 mg/m ³) ST 0.3 ppm (0.9 mg/m ³)	0.1 ppm (0.3 mg/m ³)	9.24		Not recommended	Poor Odor Warning Unknown Filter Effectiveness	High vapor pressure. May explode near boiling point temperature.
Chlorine trifluoride	7790-91-2	Chlorine fluoride, Chlorotrifluoride		C 0.1 ppm (0.4 mg/m ³)	C 0.1 ppm (0.4 mg/m ³)	<3.0		AG/OV or MB	Unknown Filter Effectiveness Poor Odor Warning	Requires both filters. High vapor pressure.
Chloroacetaldehyde	107-20-0	Chloroacetaldehyde (40% aqueous solution), 2-Chloroacetaldehyde, 2-Chloroethanal		C 1 ppm (3 mg/m ³)	C 1 ppm (3 mg/m ³)	0.917		OV	Poor Odor Warning Unknown Filter Effectiveness	
alpha-Chloroacetophenone	532-27-4	2-Chloroacetophenone; Chloromethyl phenyl ketone; Mace®; Phenacyl chloride; Phenyl chloromethyl ketone; Tear gas		0.3 mg/m ³ (0.05 ppm)	0.3 mg/m ³ (0.05 ppm)	0.026		OV/HEPA	Unknown Filter Effectiveness Low Odor Threshold	Chemical is used as "tear gas" with low exposure limit. Requires both filters.
Chloroacetyl chloride	79-04-9	Chloroacetic acid chloride, Chloroacetic chloride, Monochloroacetyl chloride		0.05 ppm (0.2 mg/m ³)	None	0.011		AG/ OV	Unknown Filter Effectiveness Low Odor Threshold	Requires both filters.
Chlorobenzene	108-90-7	Benzene chloride, Chlorobenzol, MCB, Monochlorobenzene, Phenyl chloride		No established REL	75 ppm (350 mg/m ³)	0.741	19.9	OV		
o-Chlorobenzylidene malononitrile	2698-41-1	2-Chlorobenzalmononitrile, CS, OCBM		C 0.05 ppm (0.4 mg/m ³) [skin]	0.05 ppm (0.4 mg/m ³)	Not established		OV/HEPA	Unknown Filter Effectiveness Unknown Odor Threshold	Requires both filters
Chlorobromomethane	74-97-5	Bromochloromethane; CB; CBM; Fluorocarbon 1011; Halon® 1011; Methyl chlorobromide		200 ppm (1050 mg/m ³)	200 ppm (1050 mg/m ³)	399	10.1	OV	Poor Odor Warning	

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Chlorodifluoromethane	75-45-6	Difluorochloromethane; Fluorocarbon-22; Freon® 22; Genetron® 22; Monochlorodifluoromethane; Refrigerant 22		1000 ppm (3500 mg/m³) ST 1250 ppm (4375 mg/m³)	None	Nearly Odorless		Not recommended	Unknown Odor Threshold Unknown Filter Effectiveness Poor Odor Warning	
Chlorodiphenyl (42% chlorine)	53469-21-9	Aroclor® 1242, PCB, Polychlorinated biphenyl		Ca TWA 0.001 mg/m³	1 mg/m³	Not established		OV/HEPA	Carcinogen Unknown Odor Threshold Unknown Filter Effectiveness	Requires both filters.
Chlorodiphenyl (54% chlorine)	11097-69-1	Aroclor® 1254, PCB, Polychlorinated biphenyl		Ca TWA 0.001 mg/m³	0.5 mg/m³ [skin]	Not established		OV/HEPA	Carcinogen Unknown Odor Threshold Unknown Filter Effectiveness	Requires both filters.
Chloroform	67-66-3	Methane trichloride, Trichloromethane		Ca ST 2 ppm (9.78 mg/m³) [60-minute]	C 50 ppm (240 mg/m³)	11.7	10.2	OV	Carcinogen Poor Odor Warning	
bis-Chloromethyl ether	542-88-1	BCME, bis-CME, Chloromethyl ether, Dichlorodimethyl ether, Dichloromethyl ether, Oxybis(chloromethane)		Ca	OSHA regulated carcinogen	Not established	18.3	OV	Carcinogen Unknown Odor Threshold Exposure Limit Not Established	
Chloromethyl methyl ether	107-30-2	Chlorodimethyl ether, Chloromethoxymethane, CMME, Dimethylchloroether, Methylchloromethyl ether		Ca	OSHA regulated carcinogen	Not established		Not recommended	Carcinogen Unknown Odor Threshold Unknown Filter Effectiveness Exposure Limit Not Established	Reacts with water to form HCl and formaldehyde.
1-Chloro-1-nitropropane	600-25-9	Korax®, Lanstan®		2 ppm (10 mg/m³)	20 ppm (100 mg/m³)	Not established	17.4	OV	Unknown Odor Threshold	
Chloropentafluoroethane	76-15-3	Fluorocarbon-115; Freon® 115; Genetron® 115; Halocarbon 115; Monochloropentafluoroethane		1000 ppm (6320 mg/m³)	None	Not established		Not recommended	Unknown Odor Threshold Unknown Filter Effectiveness	
Chloropicrin	76-06-2	Nitrochloroform, Nitrotrichloromethane, Trichloronitromethane		0.1 ppm (0.7 mg/m³)	0.1 ppm (0.7 mg/m³)	1.08	29	OV	Poor Odor Warning	High toxicity.
beta-Chloroprene	126-99-8	2-Chloro-1,3-butadiene; Chlorobutadiene; Chloroprene		Ca C 1 ppm (3.6 mg/m³) [15-minute]	25 ppm (90 mg/m³) [skin]	14.9		OV	Carcinogen Poor Odor Warning Unknown Filter Effectiveness	
o-Chlorostyrene	2039-87-4	2-Chlorostyrene, ortho-Chlorostyrene, 1-Chloro-2-ethenylbenzene		50 ppm (285 mg/m³) ST 75 ppm (428 mg/m³)	None	Not established		OV	Unknown Odor Threshold Unknown Filter Effectiveness	
o-Chlorotoluene	95-49-8	1-Chloro-2-methylbenzene, 2-Chloro-1-methylbenzene, 2-Chlorotoluene, o-Tolyl chloride		50 ppm (250 mg/m³) ST 75 ppm (375 mg/m³)	None	0.219	19.6	OV		

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2-Chloro-6-trichloromethyl pyridine	1929-82-4	2-Chloro-6-(trichloro-methyl) pyridine; Nitrapyrin; N-serve®; 2,2,2,6-Tetrachloro-2-picoline		10 mg/m³ (total) ST 20 mg/m³ (total) TWA 5 mg/m³ (resp)	15 mg/m³ (total) TWA 5 mg/m³ (resp)	Not established		Not recommended	Unknown Odor Threshold Unknown Filter Effectiveness	
Chlorpyrifos	2921-88-2	Chlorpyrifos-ethyl; O,O-Diethyl O-3,5,6-trichloro-2-pyridyl phosphorothioate; Dursban®		0.2 mg/m³ ST 0.6 mg/m³ [skin]	None	Not established		Not recommended	Unknown Odor Threshold Unknown Filter Effectiveness	
Chromic acid and chromates	1333-82-0	Chromic acid (CrO ₃): Chromic anhydride, Chromic oxide, Chromium(VI) oxide (1:3), Chromium		Ca TWA 0.001 mg/m³	0.005 mg/m³	Not established		AG/HEPA	Carcinogen Poor Odor Warning Unknown Filter Effectiveness	Requires both filters.
Chromium(II) compounds (as Cr)		Synonyms vary depending upon the specific Chromium(II)		0.5 mg/m³	0.5 mg/m³	Not established		HEPA		
Chromium(III) compounds (as Cr)		Synonyms vary depending upon the specific Chromium(III) compound		0.5 mg/m³	0.5 mg/m³	Not established		HEPA		
Chromium metal	7440-47-3	Chrome, Chromium		0.5 mg/m³	1 mg/m³	Not established		HEPA		
Chromyl chloride	14977-61-8	Chlorochromic anhydride, Chromic oxychloride, Chromium chloride oxide, Chromium dichloride dioxide, Chromium dioxide dichloride, Chromium dioxychloride, Chromium oxychloride, Dichlorodioxochromium		Ca 0.001 mg Cr(VI)/m³	None	Not established		AG	Carcinogen Unknown Odor Threshold Unknown Filter Effectiveness	
Clopidol	2971-90-6	Coyden®; 3,5-Dichloro-2,6-dimethyl-4-pyridinol		10 mg/m³ (total) ST 20 mg/m³ (total) TWA 5 mg/m³ (resp)	15 mg/m³ (total) TWA 5 mg/m³ (resp)	Not established		HEPA		
Coal dust		Anthracite coal dust, Bituminous coal dust, Lignite coal dust		1 mg/m³ [measured according to MSHA method (CPSU)] /TWA 0.9 mg/m³ [measured according to ISO/CEN/ACGIH criteria]	2.4 mg/m³ [respirable, < 5% SiO ₂] TWA (10 mg/m³)/(%)SiO ₂ + 2) [respirable, > 5% SiO ₂]	Not established		HEPA		
Coal tar pitch volatiles	65996-93-2	Pyrene, phenanthrene, acridine, chrysene, anthracene & benzo(a) pyrene). [Note: NIOSH considers coal tar, coal tar pitch, and creosote to be coal tar products]		0.1 mg/m³	0.2 mg/m³	Not established		OV/HEPA	Carcinogen Unknown Filter Effectiveness Unknown Odor Threshold	Requires both filters.
Cobalt carbonyl (as Co)	10210-68-1	Di-mu-Carbonylhexacarbonyldicobalt, Cobalt octacarbonyl, Cobalt tetracarbonyl dimer, Dicobalt carbonyl, Dicobalt Octacarbonyl, Octacarbonyldicobalt		0.1 mg/m³	None	Not established		Not recommended	Unknown Odor Threshold Unknown Filter Effectiveness	
Cobalt hydrocarbonyl (as Co)	16842-03-8	Hydrocobalt tetracarbonyl, Tetracarbonylhydridocobalt, Tetracarbonylhydrocobalt		0.1 mg/m³	None	Not established		Not recommended	Unknown Odor Threshold Unknown Filter Effectiveness	
Cobalt metal dust and fume (as Co)	7440-48-4	Cobalt metal dust, Cobalt metal fume		0.05 mg/m³	0.1 mg/m³	Not established		HEPA		

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Coke oven emissions		Synonyms vary depending upon the specific constituent		Ca TWA 0.2 mg/m ³ (benzene-soluble fraction)	0.150 mg/m ³ (benzene-soluble fraction)	Not established		OV/HEPA	Carcinogen Unknown Odor Threshold Unknown Filter Effectiveness	Requires both filters.
Copper (dusts and mists, as Cu)	7440-50-8	Copper metal dusts, Copper metal fumes		1 mg/m ³	1 mg/m ³	Not established		HEPA		
Copper fume (as Cu)	1317-38-0	CuO: Black copper oxide fume, Copper monoxide fume, Copper(II) oxide fume, Cupric oxide fume		0.1mg/m ³	0.1mg/m ³	Not established		HEPA		
Cotton dust (raw)		Raw cotton dust		<0.200 mg/m ³		Not established		HEPA		
Crag® herbicide	136-78-7	Crag® herbicide No. 1; 2-(2,4-Dichlorophenoxy)ethyl sodium sulfate; Sesone		10 mg/m ³ (total) 5 mg/m ³ (resp)	15 mg/m ³ (total) 5 mg/m ³ (resp)	Not established		HEPA		
m-Cresol	108-39-4	meta-Cresol, 3-Cresol, m-Cresylic acid, 1-Hydroxy-3-methylbenzene, 3-Hydroxytoluene, 3-Methyl phenol		2.3 ppm (10mg/m ³)	5 ppm (22mg/m ³) skin	0.68	46.7	OV/HEPA		Requires both filters.
o-Cresol	95-48-7	ortho-Cresol, 2-Cresol, o-Cresylic acid, 1-Hydroxy-2-methylbenzene, 2-Hydroxytoluene, 2-Methyl phenol		2.3 ppm (10mg/m ³)	5 ppm (22mg/m ³) skin	0.26	12	OV/HEPA		Requires both filters.
p-Cresol	106-44-5	para-Cresol, 4-Cresol, p-Cresylic acid, 1-Hydroxy-4-methylbenzene, 4-Hydroxytoluene, 4-Methyl phenol		2.3 ppm (10mg/m ³)	5 ppm (22mg/m ³) skin	0.2	12	OV/HEPA		Requires both filters.
Crotonaldehyde	4170-30-3	2-Butenal, beta-Methyl acrolein, Propylene aldehyde		2 ppm (6mg/m ³)	2 ppm (6mg/m ³)	0.135	10.4	OV		Strong odor.
Crufomate	299-86-5	4-t-Butyl-2-chlorophenylmethyl methylphosphoramidate; Dowco® 132; Ruelene®		TWA 5 mg/m ³ ST 20mg/m ³	None	Not established		Not Recommended	Unknown Odor Threshold Unknown Filter Effectiveness	
Cumene	98-82-8	Cumol, Isopropyl benzene, 2-Phenyl propane		TWA 50 ppm (245 mg/m ³) [skin]	TWA 50 ppm (245 mg/m ³) [skin]	0.024	28.9	OV	Low Odor Threshold	
Cyanamide	420-04-2	Amidocyanogen, Carbimide, Carbodiimide, Cyanogen nitride, Hydrogen cyanamide [Note: Cyanamide is also a synonym for Calcium cyanamide.]		2 mg/m ³	None	Not established		HEPA		
Cyanogen	460-19-5	Carbon nitride, Dicyan, Dicyanogen, Ethaneditrile, Oxalonitrile		10 ppm (20 mg/m ³)	None	231		Not Recommended	Poor Odor Warning Unknown Filter Effectiveness	
Cyanogen chloride	506-77-4	Chlorocyan, Chlorine cyanide, Chlorocyanide, Chlorocyanogen		C 0.3 ppm (0.6 mg/m ³)	None	0.976		Not Recommended	Poor Odor Warning Unknown Filter Effectiveness	
Cyclohexane	110-82-7	Benzene hexahydride, Hexahydrobenzene, Hexamethylene, Hexanaphthene		TWA 300 ppm (1050 mg/m ³)	TWA 300 ppm (1050 mg/m ³)	83.8	9.2	OV		

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Cyclohexanethiol	1569-69-3	Cyclohexylmercaptan, Cyclohexylthiol	☑	0.5 ppm (2.4 mg/m ³) [15-minute]	None	Not established		OV/ HEPA	Unknown Filter Effectiveness	Requires both filters. Inlet concentration should be kept below 0.5 ppm.
Cyclohexanol	108-93-0	Anol, Cyclohexyl alcohol, Hexahydrophenol, Hexalin, Hydralin, Hydroxycyclohexane	⚠	50 ppm (200 mg/m ³) [skin]	50 ppm (200 mg/m ³)	0.068	35.3	OV	Low Odor Threshold	
Cyclohexanone	108-94-1	Anone, Cyclohexyl ketone, Pimelic ketone	⚠	25 ppm (100 mg/m ³) [skin]	50 ppm (200 mg/m ³)	0.019	22	OV	Low Odor Threshold	
Cyclohexene	110-83-8	Benzene tetrahydride, Tetrahydrobenzene	☑	300 ppm (1015 mg/m ³)	300 ppm (1015 mg/m ³)	0.363	12.2	OV		
Cyclohexylamine	108-91-8	Aminocyclohexane, Aminohexahydrobenzene, Hexahydroaniline, Hexahydrobenzenamine	☑	10 ppm (40 mg/m ³)	None	2.66	24	OV		
Cyclonite	121-82-4	Cyclotrimethylenetrinitramine; Hexahydro-1,3,5-trinitro-s-triazine; RDx; Trimethylenetrinitramine; 1,3,5-Trinitro-1,3,5-triazacyclohexane	⊘	1.5 mg/m ³ ST 3 mg/m ³ [skin]	None	Not established		Not Recommended	Unknown Odor Threshold Unknown Filter Effectiveness Poor Odor Warning	Highly explosive
Cyclopentadiene	542-92-7	1,3-Cyclopentadiene	☑	75 ppm (200 mg/m ³)	75 ppm (200 mg/m ³)	3.8	4	OV		
Cyclopentane	287-92-3	Pentamethylene	☑	600 ppm (1720 mg/m ³)	None	Not established	5.7	OV		
Cyhexatin	13121-70-5	TCHH, Tricyclohexylhydroxystannane, Tricyclohexylhydroxytin, Tricyclohexylstannium hydroxide, Tricyclohexyltin hydroxide	⚠	5 mg/m ³	0.32 mg/m ³ [0.1 mg/m ³ (as Sn)]	Not established		OV/HEPA	Unknown Filter Effectiveness Unknown Odor Threshold	Requires both filters. Inlet concentration should be kept below 3 mg/m ³ .
2, 4-D	94-75-7	Dichlorophenoxyacetic acid; 2,4-Dichlorophenoxyacetic acid	⚠	10 mg/m ³	10 mg/m ³	Not established		OV/HEPA	Unknown Filter Effectiveness Unknown Odor Threshold	Requires both filters.
DDT	50-29-3	p,p'-DDT; Dichlorodiphenyltrichloroethane; 1,1,1-Trichloro-2,2-bis(p-chlorophenyl) ethane	⊘	Ca TWA 0.5 mg/m ³	1 mg/m ³ [skin]	Not established		Not Recommended	Carcinogen Unknown Odor Threshold Unknown Filter Effectiveness	
Decaborane	17702-41-9	Decaboron tetradecahydride	⊘	0.3 mg/m ³ (0.05 ppm) ST 0.9 mg/m ³ (0.15 ppm) [skin]	0.3 mg/m ³ (0.05 ppm) [skin]	0.06		Not Recommended	Poor Odor Warning Unknown Filter Effectiveness	
1-Decanethiol	143-10-2	Decylmercaptan, n-Decylmercaptan, 1-Mercaptodecane	⚠	0.5 ppm (3.6 mg/m ³) [15-minute]	None	Not established	41.8	OV	Carcinogen	Extremely low exposure limits.
Demeton	8065-48-3	O-O-Diethyl-O(and S)-2-(ethylthio)ethyl phosphorothioate mixture; Systox®	⊘	0.1 mg/m ³ [skin]	0.1 mg/m ³ [skin]	Not established		Not Recommended	Unknown Odor Threshold Unknown Filter Effectiveness	
Diacetone alcohol	123-42-2	Diacetone, 4-Hydroxy-4-methyl-2-pentanone, 2-Methyl-2-pentanol-4-one	☑	50 ppm (240 mg/m ³)	50 ppm (240 mg/m ³)	0.891	33.1	OV		

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2, 4-Diaminoanisole (and its salts)	615-05-4	1,3-Diamino-4-methoxybenzene; 4-Methoxy-1,3-benzene-diamine; 4-Methoxy-m-phenylene-diamine		Ca Minimize occupational exposure (especially skin exposures)	None	Not established		Not Recommended	Carcinogen Unknown Odor Threshold Unknown Filter Effectiveness Exposure Limit Not Established	
o-Dianisidine	119-90-4	Dianisidine; 3,3'-Dianisidine; 3,3'-Dimethoxybenzidine		Ca	Ca	Not established		Not Recommended	Carcinogen Unknown Odor Threshold Unknown Filter Effectiveness Exposure Limit Not Established	
Diazinon®	333-41-5	Basudin®; Diazide®; O,O-Diethyl-O-2-isopropyl-4-methyl-6-pyrimidinyl-phosphorothioate; Spectracide®		0.1 mg/m³ [skin]	None	Not established		Not Recommended	Unknown Odor Threshold Unknown Filter Effectiveness	
Diazomethane	334-88-3	Azimethylene, Azomethylene, Diazirine		0.2 ppm (0.4 mg/m³)	0.2 ppm (0.4 mg/m³)	Not established		Not Recommended	Unknown Odor Threshold Unknown Filter Effectiveness	
Diborane	19287-45-7	Boroethane, Boron hydride, Diboron hexahydride		0.1 ppm (0.1 mg/m³)	0.1 ppm (0.1 mg/m³)	1.8-3.5		Not Recommended	Unknown Odor Threshold Unknown Filter Effectiveness	
1, 2-Dibromo-3-chloropropane	96-12-8	1-Chloro-2,3-dibromopropane; DBCP; Dibromochloropropane		Ca	0.001 ppm	0.3 mg/m³		Not Recommended	Carcinogen	
2-N-Dibutylaminoethanol	102-81-8	Dibutylaminoethanol; 2-Dibutylaminoethanol; 2-Di-N-butylaminoethanol; 2-Di-N-butylaminoethyl alcohol; N,N-Dibutylethanolamine		2 ppm (14 mg/m³) [skin]	None	Not established		Not Recommended	Unknown Odor Threshold Unknown Filter Effectiveness	
Dibutyl phosphate	107-66-4	Dibutyl acid o-phosphate, Di-n-butyl hydrogen phosphate, Dibutyl phosphoric acid		1 ppm (5 mg/m³) ST 2 ppm (10 mg/m³)	1 ppm (5 mg/m³)	Not established		OV/HEPA	Unknown Odor Threshold	Requires both filters. Only use with inlet concentrations below the TWA.
Dibutyl phthalate	84-74-2	DBP; Dibutyl-1,2-benzene-dicarboxylate; Di-n-butyl phthalate		5 mg/m³	5 mg/m³	Not established		OV/HEPA	Unknown Odor Threshold Unknown Filter Effectiveness	Requires both filters.
Dichloroacetylene	7572-29-4	DCA, Dichloroethyne [Note: DCA is a possible decomposition product of trichloroethylene or trichloroethane.]		Ca C 0.1 ppm (0.4 mg/m³)	None	Not established		Not Recommended	Carcinogen Unknown Odor Threshold Unknown Filter Effectiveness	
o-Dichlorobenzene	95-50-1	o-DCB; 1,2-Dichlorobenzene; ortho-Dichlorobenzene; o-Dichlorobenzol		C 50 ppm (300 mg/m³)	C 50 ppm (300 mg/m³)	0.072	44.4	OV	Low Odor Threshold	
p-Dichlorobenzene	106-46-7	p-DCB; 1,4-Dichlorobenzene; para-Dichlorobenzene; Dichlorocide		Ca	75 ppm (450 mg/m³)	0.048		OV/HEPA	Carcinogen Low Odor Threshold	

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3, 3'-Dichlorobenzidine (and its salts)	91-94-1	4,4'-Diamino-3,3'-dichlorobiphenyl; Dichlorobenzidine base; o,o'-Dichlorobenzidine; 3,3'-Dichlorobiphenyl-4,4'-diamine; 3,3'-Dichloro-4,4'-biphenyldiamine; 3,3'-Dichloro-4,4'-diaminobiphenyl		Ca	Ca	Not established		HEPA	Carcinogen Unknown Odor Threshold Exposure Limit Not Established	
Dichlorodifluoromethane	75-71-8	Difluorodichloromethane; Fluorocarbon 12; Freon® 12; Genetron® 12; Halon® 122; Propellant 12; Refrigerant 12		1000 ppm (4950 mg/m ³)	1000 ppm (4950 mg/m ³)	Not established	2.1	Not Recommended	Unknown Odor Threshold	
1, 3-Dichloro-5, 5-dimethylhydantoin	118-52-5	Dactin, DDH, Halane		0.2 mg/m ³ ST 0.4 mg/m ³	0.2 mg/m ³	0.01		OV/HEPA	Low Odor Threshold Unknown Filter Effectiveness	Requires both filters.
1, 1-Dichloroethane	75-34-3	Asymmetrical dichloroethane; Ethylidene chloride; 1,1-Ethylidene dichloride		100 ppm (400 mg/m ³)	100 ppm (400 mg/m ³)	255	7.7	OV	Poor Odor Warning	Odor threshold exceeds PEL (TWA.)
1, 2-Dichloroethylene	540-59-0	Acetylene dichloride, cis-Acetylene dichloride, trans-Acetylene dichloride, sym-Dichloroethylene		200 ppm (790 mg/m ³)	200 ppm (790 mg/m ³)	11.2	8	OV		
Dichloroethyl ether	111-44-4	bis(2-Chloroethyl)ether; 2,2'-Dichlorodiethyl ether; 2,2'-Dichloroethyl ether		Ca TWA 5 ppm (30 mg/m ³) ST 10 ppm (60 mg/m ³) [skin]	15 ppm (90 mg/m ³) [skin]	0.049	18.3	OV	Carcinogen Low Odor Threshold	
Dichloromonofluoromethane	75-43-4	Dichlorofluoromethane; Fluorodichloromethane; Freon® 21; Genetron® 21; Halon® 112; Refrigerant		10 ppm (40 mg/m ³)	1000 ppm (4200 mg/m ³)	Not established		Not Recommended	Unknown Odor Threshold Unknown Filter Effectiveness	Poor filter effectiveness.
1, 1-Dichloro-1-nitroethane	594-72-9	Dichloronitroethane		2 ppm (10 mg/m ³)	10 ppm (60 mg/m ³)	Not established		OV	Unknown Filter Effectiveness Unknown Odor Threshold	Only use below TWA concentrations.
1, 3-Dichloropropene	542-75-6	3-Chloroallyl chloride; DCP; 1,3-Dichloro-1-propene; 1,3-Dichloropropylene; Telone®		Ca TWA 1 ppm (5 mg/m ³) [skin]	None	1	12	OV	Carcinogen	Check filters frequently. Use only below TWA concentrations.
2, 2-Dichloropropionic acid	75-99-0	Dalapon; 2,2-Dichloropropanoic acid; alpha,alpha-Dichloropropionic acid		1 ppm (6 mg/m ³)	None	Not established		OV/HEPA	Unknown Odor Threshold Unknown Filter Effectiveness	Requires both filters.
Dichlorotetrafluoroethane	76-14-2	1,2-Dichlorotetrafluoroethane; Freon® 114; Genetron® 114; Halon® 242; Refrigerant 114		1000 ppm (7000 mg/m ³)	1000 ppm (7000 mg/m ³)	Not established		Not Recommended	Unknown Odor Threshold	Poor filter effectiveness.
Dichlorvos	62-73-7	DDVP; 2,2-Dichlorovinyl dimethyl phosphate		1 mg/m ³ [skin]	1 mg/m ³ [skin]	Not established		Not Recommended	Unknown Odor Threshold	Poor filter effectiveness.
Dicrotophos	141-66-2	Bidrin®; Carbicron®; 2-Dimethyl-cis-2-dimethylcarbamoyl-1-methylvinylphosphate		0.25 mg/m ³ [skin]	None	Not established		Not Recommended	Unknown Odor Threshold Unknown Filter Effectiveness	
Dicyclopentadiene	77-73-6	Bicyclopentadiene; DCPD; 1,3-Dicyclopentadiene dimer; 3a,4,7,7a-Tetrahydro-4,7-methanoindene		5 ppm (30 mg/m ³)	None	0.03	12	OV	Low Odor Threshold	

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Dicyclopentadienyl iron	102-54-5	bis(Cyclopentadienyl)iron, Ferrocene, Iron dicyclopentadienyl	☑	10 mg/m ³ (total) TWA 5 mg/m ³ (resp)	15 mg/m ³ (total) TWA 5 mg/m ³ (resp)	Not established		HEPA		
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	⊘	Ca TWA 0.25 mg/m ³ [skin]	0.25 mg/m ³ [skin]	0.041		Not Recommended	Carcinogen	
Diesel exhaust		Synonyms vary depending upon the specific diesel exhaust component.	⚠	Ca	None	Varies depending on the components		MB	Carcinogen Exposure Limits Not Established Unknown Filter Effectiveness	Unknown warning characteristics. Diesel exhaust contains volatile or gaseous compounds, formaldehyde and hydrogen sulfide.
Diesel fuel	68476-30-2	Astral oil, Gas oil, Coal oil, Fuel oil, Home Heating oil, Marine diesel fuel	⚠	Ca	None. Possible carcinogen.	Not established		OV/HEPA	Carcinogen Unknown Odor Threshold Unknown Filter Effectiveness	
Diethanolamine	111-42-2	DEA; Di(2-hydroxyethyl)amine; 2,2'-Dihydroxydiethylamine; Diolamine; bis(2-Hydroxyethyl)amine; 2,2'-Iminodiethanol	⚠	3 ppm (15 mg/m ³)	None	0.025	6.5	OV	Low Odor Threshold	
Diethylamine	109-89-7	Diethamine; N,N-Diethylamine; N-Ethylethanamine	☑	10 ppm (30 mg/m ³) ST 25 ppm (75 mg/m ³)	25 ppm (75 mg/m ³)	0.186	6.8	OV		OV filter is more effective than AM filter.
2-Diethylaminoethanol	100-37-8	Diethylaminoethanol; 2-Diethylaminoethyl alcohol; N,N-Diethylethanolamine; Diethyl-(2-hydroxyethyl)amine; 2-Hydroxytriethylamine	⚠	10 ppm (50 mg/m ³) [skin]	10 ppm (50 mg/m ³) [skin]	0.034	9.4	OV	Low Odor Threshold	
Diethylenetriamine	111-40-0	N-(2-Aminoethyl)-1,2-ethanediamine; bis(2-Aminoethyl)amine; DETA; 2,2'-Diaminodiethylamine	⚠	1 ppm (4 mg/m ³) [skin]	None	9.3	4.4	OV	Poor Odor Warning	Use only below TWA concentrations.
Diethyl ketone	96-22-0	DEK, Dimethylacetone, Ethyl ketone, Metacetone, 3-Pentanone, Propione	☑	200 ppm (705 mg/m ³)	None	0.316	13.3	OV		
Diethyl phthalate	84-66-2	DEP, Diethyl ester of phthalic acid, Ethyl phthalate	☑	5 mg/m ³	None	Not established		HEPA		
Difluorodibromomethane	75-61-6	Dibromodifluoromethane; Freon® 12B2; Halon® 1202	⚠	100 ppm (860 mg/m ³)	100 ppm (860 mg/m ³)	Not established	13	OV	Unknown Odor Threshold	
Diglycidyl ether	2238-07-5	Diallyl ether dioxide; DGE; Di(2,3-epoxypropyl) ether; 2-Epoxypropyl ether; bis(2,3-Epoxypropyl) ether	⊘	Ca TWA 0.1 ppm (0.5 mg/m ³)	C 0.5 ppm (2.8 mg/m ³)	4.61		Not Recommended	Carcinogen	
Diisobutyl ketone	108-83-8	DIBK; sym-Diisopropyl acetone; 2,6-Dimethyl-4-heptanone; Isovalerone; Valerone	☑	25 ppm (150 mg/m ³)	50 ppm (290 mg/m ³)	0.339	33.2	OV/HEPA		Requires both filters.
Diisopropylamine	108-18-9	DIPA, N-(1-Methylethyl)-2-propanamine	☑	5 ppm (20 mg/m ³) [skin]	5 ppm (20 mg/m ³) [skin]	0.398	16.4	OV		
Dimethyl acetamide	127-19-5	N,N-Dimethyl acetamide; DMAC	⚠	10 ppm (35 mg/m ³) [skin]	10 ppm (35 mg/m ³) [skin]	47.9	26.2	OV	Poor Odor Warning	Use only under TWA concentrations.
Dimethylamine	124-40-3	Dimethylamine (anhydrous), N-Methylmethanamine	⚠	10 ppm (18 mg/m ³)	10 ppm (18 mg/m ³)	0.081	0.2	AM/OV or MB	Short Filter Life Low Odor Threshold	Requires both filters.

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CHEMICAL NAME	CAS No.	Synonyms		United States Exposure Limits (TWA) NIOSH	United States Exposure Limits (TWA) OSHA	Odor Threshold (ppm)	Filter Capacity (% weight @ 10ppm)	Filter Type	Warnings	Notes
4-Dimethylaminoazobenzene	60-11-7	Butter yellow; DAB; p-Dimethylaminoazobenzene; N,N-Dimethyl-4-aminoazobenzene; Methyl yellow		Ca	Ca	.005-.06		OV/HEPA	Carcinogen Low Odor Threshold Exposure Limit Not Established Unknown Filter Effectiveness	Requires both filters.
bis(2-(Dimethylamino) ethyl) ether	3033-62-3	NIAX® A99; NIAX® Catalyst A1; 2,2'-Oxybis(N,N-dimethyl ethylamine) [Note: A component (5%) of NIAX® Catalyst ESN, along with dimethylaminopropionitrile (95%).]		Exposure should be limited. See Appendix C of NIOSH Guide.	Exposure should be limited. See Appendix C of NIOSH Guide.	Not established		Not Recommended	Unknown Odor Threshold Unknown Filter Effectiveness	
Dimethylaminopropionitrile	1738-25-6	3-(Dimethylamino)propionitrile; N,N-Dimethylamino-3-propionitrile [Note: A component (95%) of NIAX® Catalyst ESN, along with bis(2-(dimethylamino) ethyl) ether (5%).]		Exposure should be limited. Can cause disorders of the nervous and genitourinary system. See Appendix C of NIOSH Guide.	Exposure should be limited. Can cause disorders of the nervous and genitourinary system. See Appendix C of NIOSH Guide.	Not established		Not Recommended	Unknown Odor Threshold Unknown Filter Effectiveness	
N, N-Dimethylaniline	121-69-7	N,N-Dimethylbenzeneamine; N,N-Dimethylphenylamine [Note: Also known as Dimethylaniline which is a correct synonym for Xylidine.]		5 ppm (25 mg/m ³) ST 10 ppm (50 mg/m ³) [skin]	5 ppm (25 mg/m ³) [skin]	0.219	40.2	OV		
Dimethyl carbamoyl chloride	79-44-7	Chloroformic acid dimethylamide; Dimethylcarbamic chloride; N,N-Dimethylcarbamoyl chloride; DMCC		Ca	None	Not established		Not Recommended	Carcinogen Exposure Limit Not Established Unknown Filter Effectiveness	
Dimethyl-1, 2-dibromo-2, 2-dichlorethyl phosphate	300-76-5	Dibrom®; 1,2-Dibromo-2,2-dichloroethyl dimethyl phosphate; Naled		3 mg/m ³ [skin]	3 mg/m ³ [skin]	Not established		HEPA		
Dimethylformamide	68-12-2	Dimethyl formamide; N,N-Dimethylformamide; DMF		10 ppm (30 mg/m ³) [skin]	10 ppm (30 mg/m ³) [skin]	100	17.2	OV	Poor Odor Warning	
1, 1-Dimethylhydrazine	57-14-7	Dimazine, DMH, UDMH, Unsymmetrical dimethylhydrazine		Ca C 0.06 ppm (0.15 mg/m ³) [2-hr]	0.5 ppm (1 mg/m ³) [skin]	8.79		Not Recommended	Carcinogen Poor Odor Warning Unknown Filter Effectiveness	
Dimethylphthalate	131-11-3	Dimethyl ester of 1,2-benzenedicarboxylic acid; DMP		5 mg/m ³	5 mg/m ³	Not established		OV/HEPA	Unknown Odor Threshold Unknown Filter Effectiveness	Requires both filters.
Dimethyl sulfate	77-78-1	Dimethyl ester of sulfuric acid, Dimethylsulfate, Methyl sulfate		Ca TWA 0.1 ppm (0.5 mg/m ³) [skin]	1 ppm (5 mg/m ³) [skin]	Not established	34.5	OV	Carcinogen Unknown Odor Threshold	
Dinitolmide	148-01-6	3,5-Dinitro-o-toluamide; 2-Methyl-3,5-dinitrobenzamide; Zoalene		5 mg/m ³	None	Not established		HEPA		

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m-Dinitrobenzene	99-65-0	meta-Dinitrobenzene; 1,3-Dinitrobenzene		1 mg/m ³ [skin]	1 mg/m ³ [skin]	Not established		OV/HEPA	Unknown Odor Threshold Unknown Filter Effectiveness	Requires both filters.
o-Dinitrobenzene	528-29-0	ortho-Dinitrobenzene; 1,2-Dinitrobenzene		1 mg/m ³ [skin]	1 mg/m ³ [skin]	Not established		OV/HEPA	Unknown Odor Threshold Unknown Filter Effectiveness	Requires both filters.
p-Dinitrobenzene	100-25-4	para-Dinitrobenzene; 1,4-Dinitrobenzene		1 mg/m ³ [skin]	1 mg/m ³ [skin]	Not established		OV/HEPA	Unknown Odor Threshold Unknown Filter Effectiveness	Requires both filters.
Dinitro-o-cresol	534-52-1	4,6-Dinitro-o-cresol; 3,5-Dinitro-2-hydroxytoluene; 4,6-Dinitro-2-methyl phenol; DNC; DNOC		0.2 mg/m ³ [skin]	0.2 mg/m ³ [skin]	Not established		HEPA		
Dinitrotoluene	25321-14-6	Dinitrotoluol, DNT, Methylidinitrobenzene [Note: Various isomers of DNT exist]		Ca TWA 1.5 mg/m ³ [skin]	1.5 mg/m ³ [skin]	Not established		OV/HEPA	Carcinogen Unknown Odor Threshold Unknown Filter Effectiveness	Requires both filters.
Di-sec octyl phthalate	117-81-7	DEHP, Di(2-ethylhexyl)phthalate, DOP, bis-(2-Ethylhexyl)phthalate, Octyl phthalate		Ca TWA 5 mg/m ³ ST 10 mg/m ³	5 mg/m ³	Not established		HEPA	Carcinogen	
Dioxane	123-91-1	Diethylene dioxide; Diethylene ether; Dioxan; p-Dioxane; 1,4-Dioxane		Ca C 1 ppm (3.6 mg/m ³) [30-minute]	100 ppm (360 mg/m ³) [skin]	7.78	10	OV	Carcinogen Poor Odor Warning	
Dioxathion	78-34-2	Delnav®; p-Dioxane-2,3-diyl ethyl phosphorodithioate; Dioxane phosphate; 2,3-p-Dioxanethiol-S,S-bis(O,O-diethyl phosphoro-dithioate); Navadel®		0.2 mg/m ³ [skin]	None	Not established		Not Recommended	Unknown Odor Threshold Unknown Filter Effectiveness	
Diphenyl	92-52-4	Biphenyl, Phenyl benzene		1 mg/m ³ (0.2 ppm)	1 mg/m ³ (0.2 ppm)	0.009		OV/HEPA	Unknown Filter Effectiveness Low Odor Threshold	Requires both filters.
Diphenylamine	122-39-4	Anilinobenzene, DPA, Phenylaniiline, N-Phenylaniiline, N-Phenylbenzenamine [Note: The carcinogen 4-Aminodiphenyl may be present as an impurity in the commercial product.]		10 mg/m ³	None	0.022		OV/HEPA	Unknown Filter Effectiveness Low Odor Threshold	Requires both filters.
Dipropylene glycol methyl ether	34590-94-8	Dipropylene glycol monomethyl ether; Dowanol® 50B		100 ppm (600 mg/m ³) ST 150 ppm (900 mg/m ³) [skin]	100 ppm (600 mg/m ³) [skin]	1,000		OV	Poor Odor Warning Unknown Filter Effectiveness	
Dipropyl ketone	123-19-3	Butyrene, DPK, 4-Heptanone, Heptan-4-one, Propyl ketone		50 ppm (235 mg/m ³)	None	Not established	23.7	OV	Unknown Odor Threshold	
Diquat (Diquat dibromide)	85-00-7	Diquat dibromide; 1,1'-Ethylene-2,2'-bipyridylium dibromide [Note: Diquat is a cation (C12H12N2 ²⁺); 1,1'-Ethylene-2,2'-bipyridylium ion). Various diquat salts are commercially available.]		0.5 mg/m ³	None	Not established		Not Recommended	Unknown Odor Threshold	

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Disulfiram	97-77-8	Antabuse®; bis(Diethylthiocarbamoyl) disulfide; Ro-Sulfiram®; TETD; Tetraethylthiuram disulfide		2 mg/m³ [Precautions should be taken to avoid concurrent exposure to ethylene dibromide.]	None	Not established		Not Recommended	Unknown Odor Threshold	
Disulfoton	298-04-4	O,O-Diethyl S-2-(ethylthio)-ethyl phosphorodithioate; Di-Syston®; Thiodemeton		0.1 mg/m³ [skin]	None	Not established		Not Recommended	Unknown Odor Threshold	
Diuron	330-54-1	3-(3,4-Dichlorophenyl)-1,1-dimethylurea; Direx®; Karmex®		10 mg/m³	None	Not established		Not Recommended	Unknown Odor Threshold	
Divinyl benzene	1321-74-0	Diethyl benzene, DVB, Vinylstyrene [Note: Commercial product contains all 3 isomers, but m-isomer predominates. Usually contains an inhibitor to prevent polymerization.]		10 ppm (50 mg/m³)	None	10	40.8	OV	Poor Odor Warning	
1-Dodecanethiol	112-55-0	Dodecyl mercaptan, 1-Dodecyl mercaptan, n-Dodecyl mercaptan, Lauryl mercaptan, n-Lauryl mercaptan, 1-Mercaptododecane		C 0.5 ppm (4.1 mg/m³) [15-minute]	None	4 mg/m³	43.1	OV		
Emery	1302-74-5	Aluminum oxide, Aluminum trioxide, Corundum, Impure corundum, Natural aluminum oxide [Note: Emery is an impure variety of Al ₂ O ₃ which may contain small impurities of iron, magnesium & silica Corundum is natural Al ₂ O ₃		Not established REL's after limited evaluation of the literature, concluded that the documentation cited by OSHA was inadequate to support the proposed PEL (as an 8-hour TWA) of 10 mg/m³ for alpha-alumina, benomyl, emery, glycerine (mist), graphite (synthetic), magnesium oxide fume, molybdenum (insoluble compounds as Mo), particulates not otherwise regulated, picloram, and rouge.	15 mg/m³ (total) TWA 5 mg/m³ (resp)	Not established		HEPA		
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-benzodioxathiepin-3-oxide; Thiodan®		0.1 mg/m³ [skin]	None	Not established		Not Recommended	Unknown Odor Threshold Unknown Filter Effectiveness	
Endrin	72-20-8	1,2,3,4,10,10-Hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-octahydro- 1,4-endo,endo-5,8-dimethanonaphthalene; Hexadrin®		0.1 mg/m³ [skin]	0.1 mg/m³ [skin]	0.118		OV/HEPA	Unknown Odor Threshold Unknown Filter Effectiveness	Requires both filters.
Enflurane	13838-16-9	2-Chloro-1-(difluoromethoxy)-1,1,2-trifluoroethane; 2-Chloro-1,1,2-trifluoroethyl difluoromethyl ether; Ethrane®		C 2 ppm (15.1 mg/m³) [60-minute] [*Note: REL for exposure to waste anesthetic gas.]	None	Not established		Not Recommended	Unknown Odor Threshold Unknown Filter Effectiveness	
Epichlorohydrin	106-89-8	1-Chloro-2,3-epoxypropane; 2-Chloropropylene oxide; gamma-Chloropropylene oxide		Ca	5 ppm (19 mg/m³) [skin]	0.934	15.2	OV	Carcinogen	

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EPN	2104-64-5	Ethyl p-nitrophenyl benzenethionophosphonate, O-Ethyl O-(4-nitrophenyl) phenylphosphonothioate	⊘	0.5 mg/m ³ [skin]	0.5 mg/m ³ [skin]	Not established		Not Recommended	Unknown Odor Threshold	
Ethanolamine	141-43-5	2-Aminoethanol, beta-Aminoethyl alcohol, Ethylolamine, 2-Hydroxyethylamine, Monoethanolamine	☑	3 ppm (8 mg/m ³) ST 6 ppm (15 mg/m ³)	3 ppm (6 mg/m ³)	2.59	27.3	OV		
Ethion	563-12-2	O,O,O',O'-Tetraethyl S,S'-methylene di(phosphorodithioate)	⊘	0.4 mg/m ³ [skin]	None	Odorless		Not Recommended	Unknown Odor Threshold	
2-Ethoxyethanol	110-80-5	Cellosolve®; EGEE; Ethylene glycol monoethyl ether	⊘	0.5 ppm (1.8 mg/m ³) [skin]	200 ppm (740 mg/m ³) [skin]	1.22	21.1	OV	Poor Odor Warning	
2-Ethoxyethyl acetate	111-15-9	Cellosolve® acetate; EGEEA; Ethylene glycol monoethyl ether acetate; Glycol monoethyl ether acetate	☑	0.5 ppm (2.7 mg/m ³) [skin]	100 ppm (540 mg/m ³) [skin]	0.182	34.4	OV		
Ethyl acetate	141-78-6	Acetic ester, Acetic ether, Ethyl ester of acetic acid, Ethyl ethanoate	☑	400 ppm (1400 mg/m ³)	400 ppm (1400 mg/m ³)	0.61	9	OV		
Ethyl acrylate	140-88-5	Ethyl acrylate (inhibited), Ethyl ester of acrylic acid, Ethyl propenoate	⚠	Ca	25 ppm (100 mg/m ³) [skin]	0.001	6.6	OV	Carcinogen Low Odor Threshold	
Ethyl alcohol	64-17-5	Alcohol, Cologne spirit, Ethanol, EtOH, Grain alcohol	☑	1000 ppm (1900 mg/m ³)	1000 ppm (1900 mg/m ³)	0.136	1.3	OV		
Ethylamine	75-04-7	Aminoethane, Ethylamine (anhydrous), Monoethylamine	⚠	10 ppm (18 mg/m ³)	10 ppm (18 mg/m ³)	0.324	0.2	AM	Short Filter Life	
Ethyl benzene	100-41-4	Ethylbenzol, Phenylethane	☑	100 ppm (435 mg/m ³) ST 125 ppm (545 mg/m ³)	100 ppm (435 mg/m ³)	2.3	27.2	OV/HEPA		Requires both filters.
Ethyl bromide	74-96-4	Bromoethane, Monobromoethane	☑	200 ppm; STEL 250 ppm	200 ppm (890 mg/m ³)	3.09	5.3	OV		
Ethyl butyl ketone	106-35-4	Butyl ethyl ketone, 3-Heptanone	☑	50 ppm (230 mg/m ³)	50 ppm (230 mg/m ³)	0.1-10.0	28	OV/HEPA		Requires both filters.
Ethyl chloride	75-00-3	Chloroethane, Hydrochloric ether, Monochloroethane, Muriatic ether	⊘	Potential occupational carcinogen	1000 ppm (2600 mg/m ³)	4.07	0.9	Not Recommended	Carcinogen Short Filter Life	
Ethylene chlorohydrin	107-07-3	2-Chloroethanol, 2-Chloroethyl alcohol, Ethylene chlorhydrin	☑	C 1 ppm (3 mg/m ³) [skin]	5 ppm (16 mg/m ³) [skin]	0.402	14.4	OV		
Ethylenediamine	107-15-3	1,2-Diaminoethane; 1,2-Ethanediamine; Ethylenediamine (anhydrous)	☑	10 ppm (25 mg/m ³)	10 ppm (25 mg/m ³)	4.27	9.6	OV		
Ethylene dibromide	106-93-4	1,2-Dibromoethane; Ethylene bromide; Glycol dibromide	⚠	Ca 0.045 ppm C 0.13 ppm [15-minute]	20 ppm C 30 ppm 50 ppm [5-minute maximum peak]	9.84	46.8	OV	Carcinogen Poor Odor Warning	
Ethylene dichloride	107-06-2	1,2-Dichloroethane; Ethylene chloride; Glycol dichloride	⚠	Ca TWA 1 ppm (4 mg/m ³) ST 2 ppm (8 mg/m ³)	50 ppm C 100 ppm 200 ppm [5-minute maximum peak in any 3 hours]	11.2	8	OV	Carcinogen Poor Odor Warning	

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Ethylene glycol	107-21-1	1,2-Dihydroxyethane; 1,2-Ethanediol; Glycol; Glycol alcohol; Monoethylene glycol		Ceiling 50 ppm	None	60.3 mg/m ³	36.8	OV/HEPA		Requires both filters.
Ethylene glycol dinitrate	628-96-6	EGDN; 1,2-Ethanediol dinitrate; Ethylene dinitrate; Ethylene nitrate; Glycol dinitrate; Nitroglycol		0.1 mg/m ³ [skin]	0.2 ppm (1 mg/m ³) [skin]	Not established		OV	Unknown Odor Threshold Unknown Filter Effectiveness	
Ethyleneimine	151-56-4	Aminoethylene, Azirane, Aziridine, Dimethyleneimine, Dimethylenimine, Ethylenimine, Ethylimine		Ca	Potential occupational Carcinogens	1.5	0.5	Not Recommended	Carcinogen Poor Odor Warning Short Filter Life Exposure Limit Not Established	
Ethylene oxide	75-21-8	Dimethylene oxide; 1,2-Epoxy ethane; Oxirane		Ca TWA <0.1 ppm (0.18 mg/m ³) C 5 ppm (9 mg/m ³) [10-min/day]	TWA 1 ppm 5 ppm [15-minute Excursion]	851	0.03	Not Recommended	Carcinogen Poor Odor Warning Short Filter Life	
Ethylene thiourea	96-45-7	1,3-Ethylene-2-thiourea; N,N-Ethylenethiourea; ETU; 2-Imidazolidine-2-thione		Ca Use encapsulated form	None	Not established		Not Recommended	Carcinogen Unknown Odor Threshold Unknown Filter Effectiveness Exposure Limit Not Established	
Ethyl ether	60-29-7	Diethyl ether, Diethyl oxide, Ethyl oxide, Ether, Solvent ether		[TWA 400 ppm; STEL 500 ppm]	400 ppm (1200 mg/m ³)	2.29	3.7	OV		
Ethyl formate	109-94-4	Ethyl ester of formic acid, Ethyl methanoate		100 ppm (300 mg/m ³)	100 ppm (300 mg/m ³)	18.6	3.4	OV		
Ethylidene norbornene	16219-75-3	ENB, 5-Ethylidenebicyclo(2.2.1)hept-2-ene, 5-Ethylidene-2-norbornene [Note: Due to its reactivity, ENB may be stabilized with tert-butyl catechol.]		C 5 ppm (25 mg/m ³)	None	0.074	28.9	OV	Low Odor Threshold	
Ethyl mercaptan	75-08-1	Ethanethiol, Ethyl sulfhydrylate, Mercaptoethane		C 0.5 ppm (1.3 mg/m ³) [15-minute]	C 10 ppm (25 mg/m ³)	0.001	2.5	OV	Low Odor Threshold	Strong odor.
N-Ethylmorpholine	100-74-3	4-Ethylmorpholine		5 ppm (23 mg/m ³) [skin]	20 ppm (94 mg/m ³) [skin]	0.275		OV	Unknown Filter Effectiveness	
Ethyl silicate	78-10-4	Ethyl orthosilicate, Ethyl silicate (condensed), Tetraethoxysilane, Tetraethyl orthosilicate, Tetraethyl silicate		10 ppm (85 mg/m ³)	100 ppm (850 mg/m ³)	3.6		OV	Unknown Filter Effectiveness	
Fenamiphos	22224-92-6	Ethyl 3-methyl-4-(methylthio)phenyl-(1-methylethyl)phosphoramidate; Namacur®; Phenamiphos		0.1 mg/m ³ [skin]	None	Not established		HEPA		
Fensulfothion	115-90-2	Dasanit®; O,O-Diethyl O-(p-methylsulfinyl)phenyl phosphorothioate; Terracur P®		0.1 mg/m ³	None	Not established		OV	Unknown Odor Threshold Unknown Filter Effectiveness	
Fenthion	55-38-9	Baytex; Entex; O,O-Dimethyl O-3-methyl-4-methylthiophenyl phosphorothioate		0.2 mg/m ³ (skin)	None	Not established		OV	Unknown Odor Threshold Unknown Filter Effectiveness	

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Ferbam	14484-64-1	tris(Dimethyl)dithiocarbamate)iron, Ferric dimethyl dithiocarbamate	☑	10 mg/m ³	15 mg/m ³	Not established		HEPA		
Ferrovandium dust	12604-58-9	Ferrovandium	☑	1 mg/m ³ ST 3 mg/m ³	1 mg/m ³	Not established		HEPA		
Fibrous glass dust		Fiber glas®; Fiberglass; Glass fibers; Glass wool	☑	3 fibers/cm ³ (fibers with diameter < or = 3.5 µm & length > or = 10 µm.) TWA 5 mg/m ³ (total)	15 mg/m ³ (total) TWA 5 mg/m ³ (resp)	Not established		HEPA		
Fluorine	7782-41-4	Fluorine-19	⊘	0.1 ppm (0.2 mg/m ³)	0.1 ppm (0.2 mg/m ³)	0.126		Not Recommended	Poor Odor Warning Unknown Filter Effectiveness	
Fluorotrichloromethane	75-69-4	Freon® 11; Monofluorotrichloromethane; Refrigerant 11; Trichlorofluoromethane; Trichloromonofluoromethane	⊘	C 1000 ppm (5600 mg/m ³)	1000 ppm (5600 mg/m ³)	16.3		Not Recommended		High ozone depletion.
Fluoroxene	406-90-6	2,2,2-Trifluoroethoxyethene; 2,2,2-Trifluoroethyl vinyl ether	⊘	C 2 ppm (10.3 mg/m ³) [60-minute]	None	Not established		Not Recommended	Unknown Odor Threshold Unknown Filter Effectiveness	
Fonofos	944-22-9	Dyfonate®; Dyphonate; O-Ethyl-S-phenyl ethylphosphorothioate; Fonophos	⊘	0.1 mg/m ³ [skin]	None	Not established		Not Recommended	Unknown Odor Threshold Unknown Filter Effectiveness	
Formaldehyde	50-00-0	Methanal, Methyl aldehyde, Methylene oxide	⚠	Ca TWA 0.016 ppm C 0.1 ppm [15-minute]	0.75 ppm ST 2 ppm	0.871	10	FORM	Carcinogen Poor Odor Warning	
Formalin (as formaldehyde)		Formaldehyde solution	⚠	Ca TWA 0.016 ppm C 0.1 ppm [15-minute]	0.75 ppm ST 2 ppm	0.8	10	FORM	Carcinogen Poor Odor Warning	
Formamide	75-12-7	Carbamide, Methanamide	⚠	10 ppm (15 mg/m ³) [skin]	None	80	36.5	OV	Poor Odor Warning	
Formic acid	64-18-6	Formic acid (85-95% in aqueous solution); Hydrogen carboxylic acid; Methanoic acid	⚠	5 ppm (9 mg/m ³)	5 ppm (9 mg/m ³)	28.2	0.2	OV	Poor Odor Warning	
Furfural	98-01-1	Fural, 2-Furancarboxaldehyde, Furfuraldehyde, 2-Furfuraldehyde	⚠	2 ppm (skin)	5 ppm (20 mg/m ³) [skin]	0.058	32.6	OV	Low Odor Threshold	
Furfuryl alcohol	98-00-0	2-Furylmethanol, 2-Hydroxymethylfuran	☑	10 ppm (40 mg/m ³) ST 15 ppm (60 mg/m ³) [skin]	50 ppm (200 mg/m ³)	7.83	38.9	OV/HEPA		Requires both filters.
Gasoline	8006-61-9	Motor fuel, Motor spirits, Natural gasoline, Petrol [Note: A complex mixture of volatile hydrocarbons (paraffins, cycloparaffins & aromatics).]	⚠	Ca	None	0.3	20	OV	Carcinogen Exposure Limit Not Established	
Germanium tetrahydride	7782-65-2	Germane, Germanium hydride, Germanomethane, Monogermane [Note: Used chiefly for the production of high purity germanium for use in semiconductors.]	⊘	0.2 ppm (0.6 mg/m ³)	None	Not established		Not recommended	Unknown Odor Threshold Unknown Filter Effectiveness	

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Glutaraldehyde	111-30-8	Glutaric dialdehyde; 1,5-Pentanedial		C 0.2 ppm (0.8 mg/m ³)	None	0.038	3	OV/HEPA	Low Odor Threshold	Requires both filters. Use both filters as both vapor and particulate phase exist sometimes.
Glycerin (mist)	56-81-5	Glycerin (anhydrous); Glycerol; Glycyl alcohol; 1,2,3-Propanetriol; Trihydroxypropane		Not established REL's -a limited evaluation of the literature and concluded that the documentation cited by OSHA was inadequate to support the proposed PEL (as an 8-hour TWA) of 10 mg/m ³ for alpha-alumina, benomyl, emery, glycerine (mist), graphite (synth)	15 mg/m ³ (total) TWA 5 mg/m ³ (resp)	Not established		HEPA		
Glycidol	556-52-5	2,3-Epoxy-1-propanol; Epoxypropyl alcohol; Glycide; Hydroxymethyl ethylene oxide; 2-Hydroxymethyl oxiran; 3-Hydroxypropylene oxide		25 ppm (75 mg/m ³)	50 ppm (150 mg/m ³)	Not established	16.9	OV	Unknown Odor Threshold	
Glycolonitrile	107-16-4	Cyanomethanol, Formaldehyde cyanohydrin, Glycolic nitrile, Glyconitrile, Hydroxyacetoneitrile		C 2 ppm (5 mg/m ³) [15-minute]	None	Not established		Not recommended	Unknown Odor Threshold Unknown Filter Effectiveness	
Grain dust (oat, wheat, barley)		Grain dust consists of 60-75% organic materials (cereal grains) & 25-40% inorganic materials (soil), and includes fertilizers, pesticides & microorganisms.]		4 mg/m ³	10 mg/m ³	Not established		HEPA		
Graphite (natural)	7782-42-5	Black lead, Mineral carbon, Plumbago, Silver graphite, Stove black [Note: Also see specific listing for Graphite (synthetic)]		2.5 mg/m ³ (resp)	15 mppcf	Not established		HEPA		
Graphite (synthetic)	7440-44-0	Acheson graphite, Artificial graphite [Note: Also see specific listing for Graphite (natural).]		Not established REL's -a limited evaluation of the literature and concluded that the documentation cited by OSHA was inadequate to support the proposed PEL (as an 8-hour TWA) of 10 mg/m ³ for alpha-alumina, benomyl, emery, glycerine (mist), graphite (synth)	15 mg/m ³ (total) TWA 5 mg/m ³ (resp)	Not established		HEPA		
Gypsum	13397-24-5	Calcium(II) sulfate dihydrate, Gypsum stone, Hydrated calcium sulfate, Mineral white [Note: Gypsum is the dihydrate form of calcium sulfate; Plaster of Paris is the hemihydrate form.]		10 mg/m ³ (total) TWA 5 mg/m ³ (resp)	15 mg/m ³ (total) TWA 5 mg/m ³ (resp)	Not established		HEPA		
Hafnium	7440-58-6	Celtium, Elemental hafnium, Hafnium metal		0.5 mg/m ³	0.5 mg/m ³	Not established		HEPA		

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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 2 ppm (16.2 mg/m ³) [60-minute] [*Note: REL for exposure to waste anesthetic gas.]	None	33	16.5	OV	Poor Odor Warning	
Heptachlor	76-44-8	1,4,5,6,7,8,8-Heptachloro-3a,4,7,7a-tetrahydro-4,7-methanoindene		Ca TWA 0.5 mg/m ³ [skin]	0.5 mg/m ³ [skin]	0.3mg/m ³		OV/HEPA	Carcinogen Unknown Filter Effectiveness	Requires both filters.
n-Heptane	142-82-5	Heptane, normal-Heptane		85 ppm (350 mg/m ³) C 440 ppm (1800 mg/m ³) [15-minute]	500 ppm (2000 mg/m ³)	9.77	17.4	OV		
1-Heptanethiol	1639-09-4	Heptyl mercaptan, n-Heptyl mercaptan		C 0.5 ppm (2.7 mg/m ³) [15-minute]	None	Not established	34.7	OV	Unknown Odor Threshold	
Hexachlorobutadiene	87-68-3	HCBD; Hexachloro-1,3-butadiene; 1,3-Hexachlorobutadiene; Perchlorobutadiene		Ca TWA 0.02 ppm (0.24 mg/m ³) [skin]	None	1		OV	Carcinogen Unknown Filter Effectiveness Poor Odor Warning	
Hexachlorocyclopentadiene	77-47-4	HCCPD; Hexachloro-1,3-cyclopentadiene; 1,2,3,4,5,5-Hexachloro-1,3-cyclopentadiene; Perchlorocyclopentadiene		0.01 ppm (0.1 mg/m ³)	None	0.03	83.1	OV	Poor Odor Warning Low Odor Threshold	Highly toxic with unpleasant odor.
Hexachloroethane	67-72-1	Carbon hexachloride, Ethane hexachloride, Perchloroethane		Ca TWA 1 ppm (10 mg/m ³) [skin]	1 ppm (10 mg/m ³) [skin]	0.15		OV/HEPA	Carcinogen Unknown Filter Effectiveness	Requires both filters.
Hexachloronaphthalene	1335-87-1	Halowax® 1014		0.2 mg/m ³ [skin]	0.2 mg/m ³ [skin]	Not established		OV/HEPA	Unknown Filter Effectiveness Unknown Odor Threshold	Requires both filters.
1-Hexadecanethiol	2917-26-2	Cetyl mercaptan, Hexadecanethiol-1, n-Hexadecanethiol, Hexadecyl mercaptan		C 0.5 ppm (5.3 mg/m ³) [15-minute]	None	Not established		OV	Unknown Odor Threshold Unknown Filter Effectiveness	
Hexafluoroacetone	684-16-2	Hexafluoro-2-propanone; 1,1,1,3,3,3-Hexafluoro-2-propanone; HFA; Perfluoroacetone		0.1 ppm (0.7 mg/m ³) [skin]	None	Not established		Not Recommended	Unknown Filter Effectiveness Unknown Odor Threshold	Compressed gas.
Hexamethylene diisocyanate	822-06-0	1,6-Diisocyanatohexane; HDI; Hexamethylene-1,6-diisocyanate; 1,6-Hexamethylene diisocyanate; HMDI		0.005 ppm (0.035 mg/m ³) C 0.020 ppm (0.140 mg/m ³) [10-minute]	None	0.01		OV/HEPA	Poor Odor Warning Unknown Filter Effectiveness Low Odor Threshold	Requires both filters. Work below exposure limits.
Hexamethyl phosphoramide	680-31-9	Hexamethylphosphoric triamide, Hexamethylphosphorotriamide, HMPA, Tris(dimethylamino)phosphine oxide		Ca	None	Not established		Not Recommended	Carcinogen Unknown Odor Threshold Exposure Limit Not Established Unknown Filter Effectiveness	

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n-Hexane	110-54-3	Hexane, Hexyl hydride, normal-Hexane	☑	50 ppm (180 mg/m ³)	500 ppm (1800 mg/m ³)	21.9	11.2	OV		
Hexane isomers (excluding n-Hexane)		Diethylmethylethane; Diisopropyl; 2,2-Dimethylbutane; 2,3-Dimethylbutane; Isohexane; 2-Methylpentane; 3-Methylpentane [Note: Also see specific listing for n-Hexane.]	☑	100 ppm (350 mg/m ³) C 510 ppm (1800 mg/m ³) [15-minute]	None	65-248	9.6	OV		
n-Hexanethiol	111-31-9	1-Hexanethiol, Hexyl mercaptan, n-Hexyl mercaptan, n-Hexylthiol	⚠	C 0.5 ppm (2.7 mg/m ³) [15-minute]	None	Not established		OV	Unknown Odor Threshold Unknown Filter Effectiveness	
2-Hexanone	591-78-6	Butyl methyl ketone, MBK, Methyl butyl ketone, Methyl n-butyl ketone	☑	1 ppm (4 mg/m ³)	100 ppm (410 mg/m ³)	0.166	21.6	OV		
Hexone	108-10-1	Isobutyl methyl ketone, Methyl isobutyl ketone, 4-Methyl 2-pentanone, MIBK	☑	50 ppm (205 mg/m ³) ST 75 ppm (300 mg/m ³)	100 ppm (410 mg/m ³)	0.121	19.4	OV		
sec-Hexyl acetate	108-84-9	1,3-Dimethylbutyl acetate; Methylisoamyl acetate	☑	50 ppm (300 mg/m ³)	50 ppm (300 mg/m ³)	0.219	14.6	OV/HEPA		Requires both filters.
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 25 ppm (125 mg/m ³)	None	49.9	46.3	OV	Poor Odor Warning	
Hydrazine	302-01-2	Diamine, Hydrazine (anhydrous), Hydrazine base	⊘	Ca C 0.03 ppm (0.04 mg/m ³) [2-hour]	1 ppm (1.3 mg/m ³) [skin]	3.6		Not Recommended	Carcinogen Unknown Filter Effectiveness Poor Odor Warning	
Hydrogenated terphenyls	61788-32-7	Hydrogenated diphenylbenzenes, Hydrogenated phenylbiphenyls, Hydrogenated triphenyls [Note: Complex mixture of terphenyl isomers that are partially hydrogenated]	⊘	0.5 ppm (5 mg/m ³)	None	Not established		Not Recommended	Unknown Filter Effectiveness	
Hydrogen bromide	10035-10-6	Anhydrous hydrogen bromide; Aqueous hydrogen bromide (i.e., Hydrobromic acid)	☑	3 ppm (10 mg/m ³)	3 ppm (10 mg/m ³)	2	5	AG		
Hydrogen chloride	7647-01-0	Anhydrous hydrogen chloride; Aqueous hydrogen chloride (i.e., Hydrochloric acid, Muriatic acid)	☑	C 5 ppm (7 mg/m ³)	C 5 ppm (7 mg/m ³)	0.77	17	AG		
Hydrogen cyanide	74-90-8	Formonitrile, Hydrocyanic acid, Prussic acid	⊘	ST 4.7 ppm (5 mg/m ³) [skin]	10 ppm (11 mg/m ³) [skin]	0.603		Not Recommended	Unknown Filter Effectiveness	
Hydrogen fluoride	7664-39-3	Anhydrous hydrogen fluoride; Aqueous hydrogen fluoride (i.e., Hydrofluoric acid); HF-A	⊘	3 ppm (2.5 mg/m ³) C 6 ppm (5 mg/m ³) [15-minute]	3 ppm	0.042	3	Not recommended	Low Odor Threshold	Attacks glass and is not recommended.
Hydrogen peroxide	7722-84-1	High-strength hydrogen peroxide, Hydrogen dioxide, Hydrogen peroxide (aqueous), Hydroperoxide, Peroxide	⊘	1 ppm (1.4 mg/m ³)	1 ppm (1.4 mg/m ³)	Not established		Not Recommended	Unknown Odor Threshold Unknown Filter Effectiveness	Contact with combustible material may cause spontaneous combustion.

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Hydrogen selenide	7783-07-5	Selenium dihydride, Selenium hydride		0.05 ppm (0.2 mg/m ³)	0.05 ppm (0.2 mg/m ³)	0.3		Not Recommended	Poor Odor Warning Unknown Filter Effectiveness	Highly toxic.
Hydrogen sulfide	7783-06-4	Hydrosulfuric acid, Sewer gas, Sulfuretted hydrogen		C 10 ppm (15 mg/m ³) [10-minute]	C 20 ppm 50 ppm [10-minute maximum peak]	“.0005”	6.5	AG	Low Odor Threshold	
Hydroquinone	123-31-9	p-Benzenediol; 1,4-Benzenediol; Dihydroxybenzene; 1,4-Dihydroxybenzene; Quinol		C 2 mg/m ³ [15-minute]	2 mg/m ³	Not established		OV/HEPA	Unknown Odor Threshold Unknown Filter Effectiveness	Requires both filters.
2-Hydroxypropyl acrylate	999-61-1	HPA, beta-Hydroxypropyl acrylate, Propylene glycol monoacrylate		0.5 ppm (3 mg/m ³) [skin]	None	Not established		OV	Unknown Odor Threshold Unknown Filter Effectiveness	
Indene	95-13-6	Indonaphthene		10 ppm (45 mg/m ³)	None	0.009	39.9	OV	Low Odor Threshold	
Indium	7440-74-6	Indium metal		0.1 mg/m ³	None	Not established		HEPA		
Iodine	7553-56-2	Iodine crystals, Molecular iodine		C 0.1 ppm (1 mg/m ³)	C 0.1 ppm (1 mg/m ³)	0.9		RAD/HEPA	Poor Odor Warning Unknown Filter Effectiveness	Requires both filters. RAD Filter removes 25% organic vapor.
Iodoform	75-47-8	Triiodomethane		0.6 ppm (10 mg/m ³)	None	0.000-1.1		RAD/HEPA	Poor Odor Warning Unknown Filter Effectiveness	Requires both filters. RAD Filter removes 25% organic vapor.
Iron oxide dust and fume (as Fe)	1309-37-1	Ferric oxide, Iron(III) oxide		5 mg/m ³	10 mg/m ³	Not established		HEPA		
Iron pentacarbonyl (as Fe)	13463-40-6	Iron carbonyl, Pentacarbonyl iron		0.1 ppm (0.2 ³ mg/m ³) ST 0.2 ppm (0.45 mg/m ³)	None	Not established		Not Recommended	Unknown Filter Effectiveness Unknown Odor Threshold	
Iron salts (soluble, as Fe)		FeSO ₄ : Ferrous sulfate, Iron(II) sulfate		1 mg/m ³	None	Not established		HEPA		
Isoamyl acetate	123-92-2	Banana oil, Isopentyl acetate, 3-Methyl-1-butanol acetate, 3-Methylbutyl ester of acetic acid, 3-Methylbutyl ethanoate		100 ppm (525 mg/m ³)	100 ppm (525 mg/m ³)	0.004	29.7	OV	Low Odor Threshold	
Isoamyl alcohol (secondary)	6032-29-7	3-Methyl-2-butanol, Secondary isoamyl alcohol		100 ppm (360 mg/m ³) ST 125 ppm (450 mg/m ³)	100 ppm (360 mg/m ³)	0.045	19.4	OV	Low Odor Threshold	
Isoamyl alcohol (primary)	123-51-3	Fermentation amyl alcohol, Fusel oil, Isobutyl carbinol, Isopentyl alcohol, 3-Methyl-1-butanol, Primary isoamyl alcohol		100 ppm (360 mg/m ³) ST 125 ppm (450 mg/m ³)	100 ppm (360 mg/m ³)	0.045	23.2	OV	Low Odor Threshold	
Isobutane	75-28-5	2-Methylpropane [Note: Also see specific listing for n-Butane.]		800 ppm (1900 mg/m ³)	None	Not established		Not Recommended	Unknown Filter Effectiveness Unknown Odor Threshold	

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Isobutyl acetate	110-19-0	Isobutyl ester of acetic acid, 2-Methylpropyl acetate, 2-Methylpropyl ester of acetic acid, beta-Methylpropyl ethanoate	☑	150 ppm (700 mg/m ³)	150 ppm (700 mg/m ³)	0.479	22.8	OV		
Isobutyl alcohol	78-83-1	IBA, Isobutanol, Isopropylcarbinol, 2-Methyl-1-propanol	☑	50 ppm (150 mg/m ³)	100 ppm (300 mg/m ³)	0.832	13.9	OV		
Isobutyronitrile	78-82-0	Isopropyl cyanide, 2-Methylpropanenitrile, 2-Methylpropionitrile	⚠	8 ppm (22 mg/m ³)	None	Not established	8.3	OV/HEPA	Unknown Odor Threshold	Requires both filters.
Isooctyl alcohol	26952-21-6	Isooctanol, Oxooctyl alcohol [Note: A mixture of closely related isomeric, primary alcohols with branched chains such as 2-Ethylhexanol]	⚠	50 ppm (270 mg/m ³) [skin]	None	0.138		OV	Unknown Filter Effectiveness	
Isophorone	78-59-1	Isoacetophorone; 3,5,5-Trimethyl-2-cyclohexenone; 3,5,5-Trimethyl-2-cyclo-hexen-1-one	☑	4 ppm (23 mg/m ³)	25 ppm (140 mg/m ³)	0.631	40.5	OV		
Isophorone diisocyanate	4098-71-9	3-Isocyanatomethyl-3,5,5-trimethylcyclohexyl-isocyanate; Isophorone diamine diisocyanate	⚠	.005 ppm (0.045 mg/m ³) ST 0.02 ppm (0.180 mg/m ³) [skin]	None	Not established		OV/HEPA	Unknown Odor Threshold Unknown Filter Effectiveness	Requires both filters.
2-Isopropoxyethanol	109-59-1	Ethylene glycol isopropyl ether; beta-Hydroxyethyl isopropyl ether; Isopropyl Cellosolve®; Isopropyl glycol	⚠	Not established REL's—after limited evaluation of the literature and concluded that the documentation cited by OSHA was inadequate to support the proposed PEL (as an 8-hour TWA) of 10 mg/m ³ for alpha-alumina, benomyl, emery, glycerine (mist), graphite (synth)	None	0.738		OV	Unknown Filter Effectiveness Exposure Limit Not Established	
Isopropyl acetate	108-21-4	Isopropyl ester of acetic acid, 1-Methylethyl ester of acetic acid, 2-Propyl acetate	⚠	Not established REL's—after limited evaluation of the literature and concluded that the documentation cited by OSHA was inadequate to support the proposed PEL (as an 8-hour TWA) of 10 mg/m ³ for alpha-alumina, benomyl, emery, glycerine (mist), graphite (synth)	None	0.05-4.1	11.6	OV	Exposure Limit Not Established	
Isopropyl alcohol	67-63-0	Dimethyl carbinol, IPA, Isopropanol, 2-Propanol, sec-Propyl alcohol, Rubbing alcohol	☑	400 ppm (980 mg/m ³) ST 500 ppm (1225 mg/m ³)	400 ppm (980 mg/m ³)	22	5	OV		

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Isopropylamine	75-31-0	2-Aminopropane, Monoisopropylamine, 2-Propylamine, sec-Propylamine	☑	Not established REL's—after limited evaluation of the literature and concluded that the documentation cited by OSHA was inadequate to support the proposed PEL (as an 8-hour TWA) of 10 mg/m ³ for alpha-alumina, benomyl, emery, glycerine (mist), graphite (synth)	5 ppm (12 mg/m ³)	0.6	2.7	OV		
N-Isopropylaniline	768-52-5	N-IPA, Isopropylaniline, N-(1-Methylethyl)-benzenamine, N-Phenylisopropylamine	⚠	2 ppm (10 mg/m ³) [skin]	None	Not established		OV	Unknown Odor Threshold Unknown Filter Effectiveness	
Isopropyl ether	108-20-3	Diisopropyl ether, Diisopropyl oxide, 2-Isopropoxy propane	⚠	500 ppm (2100 mg/m ³)	500 ppm (2100 mg/m ³)	0.055	13.7	OV	Low Odor Threshold	
Isopropyl glycidyl ether	4016-14-2	1,2-Epoxy-3-isopropoxypropane; IGE; Isopropoxymethyl oxirane	⚠	C 50 ppm (240 mg/m ³) [15-minute]	50 ppm (240 mg/m ³)	297	13.8	OV	Poor Odor Warning	
Kaolin	1332-58-7	China clay, Clay, Hydrated aluminum silicate, Hydrite, Porcelain clay	☑	10 mg/m ³ (total) TWA 5 mg/m ³ (resp)	5 mg/m ³ (resp)	Not established		HEPA		
Kepone	143-50-0	Chlordecone; Decachlorooctahydro-1,3,4-metheno-2H-cyclobuta(cd)-pentalen-2-one; Decachlorooctahydro-kepone-2-one; Decachlorotetrahydro-4,7-methanoindeneone	⚠	Ca TWA 0.001 mg/m ³	None	Not established		OV/HEPA	Carcinogen Unknown Odor Threshold Unknown Filter Effectiveness	Requires both filters.
Kerosene	8008-20-6	Fuel Oil No. 1, Range oil	⚠	100 mg/m ³	None	1		OV/HEPA	Unknown Filter Effectiveness	Requires both filters as an aerosol.
Ketene	463-51-4	Carbomethene, Ethenone, Ketoethylene	⊘	0.5 ppm (0.9 mg/m ³) ST 1.5 ppm (3 mg/m ³)	0.5 ppm (0.9 mg/m ³)	Not established		Not Recommended	Unknown Filter Effectiveness Unknown Odor Threshold	
Lead	7439-92-1	Lead metal, Plumbum	☑	TWA (8-hour) 0.050 mg/m ³	TWA 0.050 mg/m ³	Not established		HEPA		
Limestone	1317-65-3	Calcium carbonate, Natural calcium carbonate	☑	10 mg/m ³ (total) TWA 5 mg/m ³ (resp)	15 mg/m ³ (total) TWA 5 mg/m ³ (resp)	Not established		HEPA		
Lindane	58-89-9	BHC; HCH; gamma-Hexachlorocyclohexane; gamma isomer of 1,2,3,4,5,6-Hexachlorocyclohexane	⚠	0.5 mg/m ³ [skin]	0.5 mg/m ³ [skin]	12		OV/HEPA	Unknown Filter Effectiveness	Requires both filters.
Lithium hydride	7580-67-8	Lithium monohydride	☑	0.025 mg/m ³	0.025 mg/m ³			HEPA		
L.P.G.	68476-85-7	Bottled gas, Compressed petroleum gas, Liquefied hydrocarbon gas, Liquefied petroleum gas, LPG [Note: A fuel mixture of propane, propylene, butanes & butylenes.]	⊘	1000 ppm (1800 mg/m ³)	1000 ppm (1800 mg/m ³)	5000-20000		Not Recommended	Unknown Filter Effectiveness Poor Odor Warning	

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Magnesite	546-93-0	Carbonate magnesium, Hydromagnesite, Magnesium carbonate, Magnesium(II) carbonate [Note: Magnesite is a naturally-occurring form of magnesium carbonate.]	☑	10 mg/m ³ (total) TWA 5 mg/m ³ (resp)	15 mg/m ³ (total) TWA 5 mg/m ³ (resp)	Not established		HEPA		
Magnesium oxide fume	1309-48-4	Magnesia fume	☑	Not established REL's - after limited evaluation of the literature and concluded that the documentation cited by OSHA was inadequate to support the proposed PEL (as an 8-hour TWA) of 10 mg/m ³ for alpha-alumina, benomyl, emery, glycerine (mist), graphite (synth)	15 mg/m ³	Not established		HEPA		
Malathion	121-75-5	S-[1,2-bis(ethoxycarbonyl) ethyl] O,O-dimethyl-phosphorodithioate; Diethyl (dimethoxyphosphinothioylthio) succinate	⚠	10 mg/m ³ [skin]	15 mg/m ³ [skin]	13.5 mg/m ³		OV/HEPA	Poor Odor Warning Unknown Filter Effectiveness	Requires both filters.
Maleic anhydride	108-31-6	cis-Butenedioic anhydride; 2,5-Furandione; Maleic acid anhydride; Toxilic anhydride	⚠	1 mg/m ³ (0.25 ppm)	1 mg/m ³ (0.25 ppm)	0.318		OV/HEPA	Poor Odor Warning Unknown Filter Effectiveness	Requires both filters.
Malonaldehyde	542-78-9	Malonic aldehyde; Malonodialdehyde; Propanedial; 1,3-Propanedial [Note: Pure Malonaldehyde is unstable and may be used as its sodium salt.]	⚠	Ca	None	Not established		OV/HEPA	Carcinogen Unknown Odor Threshold Unknown Exposure Limit Unknown Filter Effectiveness	Requires both filters.
Malononitrile	109-77-3	Cyanoacetonitrile, Dicyanomethane, Malonic dinitrile	⚠	3 ppm (8 mg/m ³)	None	Not established		OV/HEPA	Unknown Filter Effectiveness Unknown Odor Threshold	Requires both filters.
Manganese compounds and fume (as Mn)	7439-96-5	Manganese metal: Colloidal manganese, Manganese-55	☑	1 mg/m ³ ST 3 mg/m ³ [*Note: Also see specific listings for Manganese cyclopentadienyl tricarbonyl, Methyl cyclopentadienyl manganese tricarbonyl, and Manganese tetroxide.]	C 5 mg/m ³ [*Note: Also see specific listings for Manganese cyclopentadienyl tricarbonyl and Methyl cyclopentadienyl manganese tricarbonyl.]	Not established		HEPA		
Manganese cyclopentadienyl tricarbonyl (as Mn)	12079-65-1	Cyclopentadienylmanganese tricarbonyl, Cyclopentadienyl tricarbonyl manganese, MCT	⚠	0.1 mg/m ³ [skin]	C 5 mg/m ³	Not established		OV/HEPA	Unknown Filter Effectiveness	Requires both filters. Unknown filter effectiveness as a vapor.

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CHEMICAL NAME	CAS No.	Synonyms		United States Exposure Limits (TWA) NIOSH	United States Exposure Limits (TWA) OSHA	Odor Threshold (ppm)	Filter Capacity (% weight @ 10ppm)	Filter Type	Warnings	Notes
Manganese tetroxide (as Mn)	1317-35-7	Manganese oxide, Manganomanganic oxide, Trimanganese tetroxide, Trimanganese tetroxide	☑	Not established REL's -a limited evaluation of the literature and concluded that the documentation cited by OSHA was inadequate to support the proposed PEL (as an 8-hour TWA) of 10 mg/m ³ for alpha-alumina, benomyl, emery, glycerine (mist), graphite (synth)	C 5 mg/m ³	Not established		HEPA		
Marble	1317-65-3	Calcium carbonate, Natural calcium carbonate [Note: Marble is a metamorphic form of calcium carbonate.]	☑	10 mg/m ³ (total) TWA 5 mg/m ³ (resp)	10 mg/m ³ (total) TWA 5 mg/m ³ (resp)	Not established		HEPA		
Mercury compounds [except (organo) alkyls] (as Hg)	7439-97-6	Mercury metal: Colloidal mercury, Metallic mercury, Quicksilver	⊘	Hg Vapor: TWA 0.05 mg/m ³ [skin] Other: C 0.1 mg/m ³ [skin]	0.1 mg/m ³	Not established		Not Recommended	Unknown Filter Effectiveness Unknown Odor Threshold	
Mercury (organo) alkyl compounds (as Hg)		Synonyms vary depending upon the specific (organo) alkyl mercury compound.	⊘	0.01 mg/m ³ ST 0.03 mg/m ³ [skin]	0.01 mg/m ³ C 0.04 mg/m ³	Not established		Not Recommended	Unknown Filter Effectiveness Unknown Odor Threshold	
Mesityl oxide	141-79-7	Isobutenyl methyl ketone, Isopropylideneacetone, Methyl isobutenyl ketone, 4-Methyl-3-penten-2-one	⚠	10 ppm (40 mg/m ³)	25 ppm (100 mg/m ³)	0.056	22.8	OV	Low Odor Threshold	
Methacrylic acid	79-41-4	Methacrylic acid (glacial), Methacrylic acid (inhibited), alpha-Methacrylic acid, 2-Methylacrylic acid, 2-Methylpropenoic acid	☑	20 ppm (70 mg/m ³) [skin]	None	0.2	29.4	OV		
Methomyl	16752-77-5	Lannate®; Methyl N-((methylamino) carbonyl)oxy)ethanimidothioate; S-Methyl-N-(methylcarbamoyloxy) thioacetimidate	⊘	2.5 mg/m ³	None	Not established		Not Recommended	Unknown Filter Effectiveness	
Methoxychlor	72-43-5	p,p'-Dimethoxydiphenyltrichloroethane; DMDT; Methoxy-DDT; 2,2-bis(p-Methoxyphenyl)-1,1,1-trichloroethane; 1,1,1-Trichloro-2,2-bis-(p-methoxyphenyl)ethane	⚠	Ca	15 mg/m ³	4.7 mg/kg in water		OV/HEPA	Carcinogen Unknown Filter Effectiveness	Requires both filters.
Methoxyflurane	76-38-0	2,2-Dichloro-1,1-difluoroethyl methyl ether; 2,2-Dichloro-1,1-difluoro-1-methoxyethane; Methoflurane; Methoxyfluorane; Penthrane	⊘	C 2 ppm (13.5 mg/m ³) [60-minute] [*Note: REL for exposure to waste anesthetic gas.]	None	Not established		Not Recommended	Unknown Filter Effectiveness Unknown Odor Threshold	
4-Methoxyphenol	150-76-5	Hydroquinone monomethyl ether, p-Hydroxyanisole, Mequinol, p-Methoxyphenol, Monomethyl ether hydroquinone	⚠	5 mg/m ³	None	Not established		OV/HEPA	Unknown Odor Threshold Unknown Filter Effectiveness	Requires both filters.
Methyl acetate	79-20-9	Methyl ester of acetic acid, Methyl ethanoate	☑	200 ppm (610 mg/m ³) ST 250 ppm (760 mg/m ³)	200 ppm (610 mg/m ³)	6.17	3.5	OV		

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Methyl acetylene	74-99-7	Allylene, Propine, Propyne, 1-Propyne		1000 ppm (1650 mg/m ³)	1000 ppm (1650 mg/m ³)	Not established	0.1	Not Recommended	Unknown Filter Effectiveness Unknown Odor Threshold Short Filter Life	
Methyl acetylene-propadiene mixture	59355-75-8	MAPP gas, Methyl acetylene-allene mixture, Methyl acetylene-propadiene mixture (stabilized), Propadiene-methyl acetylene, Propyne-allene mixture, Propyne-propadiene mixture		1000 ppm (1800 mg/m ³) ST 1250 ppm (2250 mg/m ³)	1000 ppm (1800 mg/m ³)	100	0.1	Not Recommended	Unknown Filter Effectiveness Short Filter Life	
Methyl acrylate	96-33-3	Methoxycarbonylethylene, Methyl ester of acrylic acid, Methyl propenoate		10 ppm (35 mg/m ³) [skin]	10 ppm (35 mg/m ³) [skin]	0.263	5.8	OV		
Methylacrylonitrile	126-98-7	2-Cyanopropene-1, 2-Cyano-1-propene, Isoprene cyanide, Isopropenyl nitrile, Methacrylonitrile, alpha-Methylacrylonitrile, 2-Methylpropenenitrile		1 ppm (3 mg/m ³) [skin]	None	6.8	6.7	OV	Poor Odor Warning	
Methylal	109-87-5	Dimethoxymethane, Formal, Formaldehyde dimethylacetal, Methoxymethyl methyl ether, Methylene dimethyl ether		1000 ppm (3100 mg/m ³)	1000 ppm (3100 mg/m ³)	Not established	3.6	OV	Unknown Odor Threshold	
Methyl alcohol	67-56-1	Carbinol, Columbian spirits, Methanol, Pyroligneous spirit, Wood alcohol, Wood naphtha, Wood spirit		200 ppm (260 mg/m ³) ST 250 ppm (325 mg/m ³) [skin]	200 ppm (260 mg/m ³)	141	0.1	Not Recommended	Short Filter Life	Not recommended due to short service life.
Methylamine	74-89-5	Aminomethane, Methylamine (anhydrous), Methylamine (aqueous), Monomethylamine		10 ppm (12 mg/m ³)	10 ppm (12 mg/m ³)	0.019		AM	Unknown Filter Effectiveness Low Odor Threshold	
Methyl (n-amy) ketone	110-43-0	Amyl methyl ketone, n-Amyl methyl ketone, 2-Heptanone		100 ppm (465 mg/m ³)	100 ppm (465 mg/m ³)	0.897 ppb	28	OV		Fruity odor at very low level.
Methyl bromide	74-83-9	Bromomethane, Monobromomethane		Ca	C 20 ppm (80 mg/m ³) [skin]	80 mg/m ³	0.3	Not Recommended	Carcinogen	Not recommended due to short service life.
Methyl Cellosolve®	109-86-4	EGME, Ethylene glycol monomethyl ether, Glycol monomethyl ether, 2-Methoxyethanol		0.1 ppm (0.3 mg/m ³) [skin]	25 ppm (80 mg/m ³) [skin]		13.1	OV		
Methyl Cellosolve® acetate	110-49-6	EGMEA, Ethylene glycol monomethyl ether acetate, Glycol monomethyl ether acetate, 2-Methoxyethyl acetate		0.1 ppm (0.5 mg/m ³) [skin]	25 ppm (120 mg/m ³) [skin]	1.07	13	OV		
Methyl chloride	74-87-3	Chloromethane, Monochloromethane		Ca	100 ppm C 200 ppm 300 ppm (5-minute maximum peak in any 3 hours)	10.2	0.1	Not Recommended	Carcinogen	Not recommended due to short service life. Forms HCl with water.
Methyl chloroform	71-55-6	Chlorothene; 1,1,1-Trichloroethane; 1,1,1-Trichloroethane (stabilized)		C 350 ppm (1900 mg/m ³) [15-minute]	350 ppm (1900 mg/m ³)	22.4	17.3	OV		
Methyl-2-cyanoacrylate	137-05-3	Mecrylate, Methyl cyanoacrylate, Methyl alpha-cyanoacrylate, Methyl ester of 2-cyanoacrylic acid		2 ppm (8 mg/m ³) ST 4 ppm (16 mg/m ³)	None	2.16		OV	Unknown Filter Effectiveness Poor Odor Warning	

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Methylcyclohexane	108-87-2	Cyclohexylmethane, Hexahydrotoluene		400 ppm (1600 mg/m ³)	500 ppm (2000 mg/m ³)	500-630	17.9	OV	Poor Odor Warning	
Methylcyclohexanol	25639-42-3	Hexahydrorescol, Hexahydromethylphenol		50 ppm (235 mg/m ³)	100 ppm (470 mg/m ³)	490	14.5	OV	(Very) Poor Odor Warning	Exposure limits are below the odor threshold.
o-Methylcyclohexanone	583-60-8	2-Methylcyclohexanone		50 ppm (230 mg/m ³) ST 75 ppm (345 mg/m ³) [skin]	100 ppm (460 mg/m ³) [skin]	0.5	15	OV	Poor Odor Warning	
Methyl cyclopentadienyl manganese tricarbonyl (as Mn)	12108-13-3	Cl-2, Combustion Improver-2, Manganese tricarbonylmethylcyclopentadienyl, 2-Methylcyclopentadienyl manganese tricarbonyl, MMT		0.2 mg/m ³ [skin]	C 5 mg/m ³	Not established		OV/HEPA	Unknown Odor Threshold Unknown Filter Effectiveness	Requires both filters.
Methyl demeton	8022-00-2	Demeton methyl; O,O-Dimethyl 2-ethylmercaptoethyl thiophosphate; Metasystox®; Methyl mercaptophos; Methyl systox		0.5 mg/m ³ [skin]	None	Not established		Not Recommended	Unknown Filter Effectiveness Poor Odor Warning	
Methylene bisphenyl isocyanate	101-68-8	4,4'-Diphenylmethane diisocyanate; MDI; Methylene bis(4-phenyl isocyanate); Methylene di-p-phenylene ester of isocyanic acid		0.05 mg/m ³ (0.005 ppm) C 0.2 mg/m ³ (0.020 ppm) [10-minute]	C 0.2 mg/m ³ (0.02 ppm)	0.384		OV/HEPA	Unknown Filter Effectiveness Poor Odor Warning	Requires both filters.
Methylene chloride	75-09-2	Dichloromethane, Methylene dichloride		Ca	25 ppm ST 125 ppm	0.912	2.5	OV	Carcinogen Short Filter Life	
4, 4'-Methylenebis(2-chloroaniline)	101-14-4	DACPM; 3,3'-Dichloro-4,4'-diaminodiphenylmethane; MBOCA; 4,4'-Methylenebis(o-chloro aniline); 4,4'-Methylenebis(2-chlorobenzeneamine); MOCA		Ca TWA 0.003 mg/m ³ [skin]	None			Not Recommended	Carcinogen	Extremely low exposure limit.
Methylene bis(4-cyclohexylisocyanate)	5124-30-1	Dicyclohexylmethane 4,4'-diisocyanate; DMDI; bis(4-Isocyanatocyclohexyl) methane; HMDI; Hydrogenated MDI; Reduced MDI; Saturated MDI		C 0.01 ppm (0.11 mg/m ³)	None	Not established		Not Recommended	Unknown Filter Effectiveness Poor Odor Warning	Extremely low exposure limit.
4, 4'-Methylenedianiline	101-77-9	4,4'-Diaminodiphenylmethane; para, para'-Diaminodiphenylmethane; Dianilinomethane; 4,4'-Diphenylmethanediamine; MDA		Ca	0.010 ppm ST 0.100 ppm	Not established		Not Recommended	Carcinogen	Extremely low exposure limit.
Methyl ethyl ketone peroxide	1338-23-4	2-Butanone peroxide, Ethyl methyl ketone peroxide, MEKP, MEK peroxide, Methyl ethyl ketone hydroperoxide		C 0.2 ppm (1.5 mg/m ³)	None	Not established		Not Recommended	Unknown Filter Effectiveness	
Methyl formate	107-31-3	Methyl ester of formic acid, Methyl methanoate		100 ppm (250 mg/m ³) ST 150 ppm (375 mg/m ³)	100 ppm (250 mg/m ³)	93.3	0.4	OV	Short Filter Life	
5-Methyl-3-heptanone	541-85-5	Amyl ethyl ketone, Ethyl amyl ketone, 3-Methyl-5-heptanone		25 ppm (130 mg/m ³)	25 ppm (130 mg/m ³)	6	8.3	OV		
Methyl hydrazine	60-34-4	MMH, Monomethylhydrazine		Ca C 0.04 ppm (0.08 mg/m ³) [2-hr]	C 0.2 ppm (0.35 mg/m ³) [skin]	1.71		Not Recommended	Carcinogen Unknown Filter Effectiveness	

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Methyl iodide	74-88-4	Iodomethane, Monoiodomethane		Ca TWA 2 ppm (10 mg/m ³) [skin]	5 ppm (28 mg/m ³) [skin]	Not established		RAD	Carcinogen Unknown Odor Threshold Unknown Filter Effectiveness	
Methyl isoamyl ketone	110-12-3	Isoamyl methyl ketone, Isopentyl methyl ketone, 2-Methyl-5-hexanone, 5-Methyl-2-hexanone, MIAK		50 ppm (240 mg/m ³)	100 ppm (475 mg/m ³)	0.042	27	OV	Low Odor Threshold	
Methyl isobutyl carbinol	108-11-2	Isobutylmethylcarbinol, Methyl amyl alcohol, 4-Methyl-2-pentanol, MIBC		25 ppm (100 mg/m ³) ST 40 ppm (165 mg/m ³) [skin]	25 ppm (100 mg/m ³) [skin]	1.1	24	OV		
Methyl isocyanate	624-83-9	Methyl ester of isocyanic acid, MIC		0.02 ppm (0.05 mg/m ³) [skin]	0.02 ppm (0.05 mg/m ³) [skin]	2.1	0.5	Not Recommended	Poor Odor Warning Short Filter Life	Highly toxic. Not recommended due to short service life.
Methyl isopropyl ketone	563-80-4	2-Acetyl propane, Isopropyl methyl ketone, 3-Methyl-2-butanone, 3-Methyl butan-2-one, MIPK		200 ppm (705 mg/m ³)	None	4.47	12.1	OV		
Methyl mercaptan	74-93-1	Mercaptomethane, Methanethiol, Methyl sulfhydrylate		C 0.5 ppm (1 mg/m ³) [15-minute]	C 10 ppm (20 mg/m ³)	0.001	0.3	Not Recommended	Short Filter Life	Not recommended due to short service life.
Methyl methacrylate	80-62-6	Methacrylate monomer, Methyl ester of methacrylic acid, Methyl-2-methyl-2-propenoate		100 ppm (410 mg/m ³)	100 ppm (410 mg/m ³)	0.085	20.6	OV	Low Odor Threshold	
Methyl parathion	298-00-0	Azophos®; O,O-Dimethyl-O-p-nitrophenylphosphorothioate; Parathion methyl		0.2 mg/m ³ [skin]	None	0.012		OV/HEPA	Low Odor Threshold Unknown Filter Effectiveness	Requires both filters.
Methyl silicate	681-84-5	Methyl orthosilicate, Tetramethoxysilane, Tetramethyl ester of silicic acid, Tetramethyl silicate		1 ppm (6 mg/m ³)	None	Not established		OV	Unknown Odor Threshold Unknown Filter Effectiveness	
alpha-Methyl styrene	98-83-9	AMS, Isopropenyl benzene, 1-Methyl-1-phenylethylene, 2-Phenyl propylene		50 ppm (240 mg/m ³) ST 100 ppm (485 mg/m ³)	C 100 ppm (480 mg/m ³)	0.003	14	OV/HEPA	Low Odor Threshold	Requires both filters.
Metribuzin	21087-64-9	4-Amino-6-(1,1-dimethylethyl)-3-(methylthio)-1,2,4-triazin-5(4H)-one		5 mg/m ³	None	Not established		OV/HEPA	Unknown Odor Threshold Unknown Filter Effectiveness	Requires both filters.
Mica (containing less than 1% quartz)	12001-26-2	Biotite, Lepidolite, Margarite, Muscovite, Phlogopite, Roscoelite, Zimwaldite		3 mg/m ³ (resp)	20 mppcf	Not established		HEPA		
Mineral wool fiber		Manmade mineral fibers, Rock wool, Slag wool, Synthetic vitreous fibers [Note: Produced by blowing steam or air through molten rock (rock wool) or various furnace slags that are by-products of metal smelting or refining processes (slag wool).]		3 fibers/cm ³ (fibers with diameter < or = 3.5 µm & length > or = 10 µm.) TWA 5 mg/m ³ (total)	15 mg/m ³ (total) TWA 5 mg/m ³ (resp)	Not established		HEPA		
Molybdenum	7439-98-7	Molybdenum metal		None	15 mg/m ³	Not established		HEPA		

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Molybdenum (soluble compounds, as Mo)		Synonyms vary depending upon the specific soluble molybdenum compound		None	5 mg/m ³	Not established		HEPA		
Monocrotophos	6923-22-4	3-Hydroxy-N-methylcrotonamide dimethylphosphate, Monocron		0.25 mg/m ³	None			Not Recommended	Unknown Filter Effectiveness	Emits toxic fumes.
Monomethyl aniline	100-61-8	MA, (Methylamino)benzene, N-Methyl aniline, Methylphenylamine, N-Phenylmethylamine		0.5 ppm (2 mg/m ³) [skin]	2 ppm (9 mg/m ³) [skin]	1.74		OV	Unknown Filter Effectiveness	
Morpholine	110-91-8	Diethylene imidoxide; Diethylene oximide; Tetrahydro-1,4-oxazine; Tetrahydro-p-oxazine		20 ppm (70 mg/m ³) ST 30 ppm (105 mg/m ³) [skin]	20 ppm (70 mg/m ³) [skin]	0.036	19	OV	Low Odor Threshold	
Naphtha (coal tar)	8030-30-6	Crude solvent coal tar naphtha, High solvent naphtha, Naphtha		100 ppm (400 mg/m ³)	100 ppm (400 mg/m ³)	0.89		OV	Unknown Filter Effectiveness	
Naphthalene	91-20-3	Naphthalin, Tar camphor, White tar		10 ppm (50 mg/m ³) ST 15 ppm (75 mg/m ³)	10 ppm (50 mg/m ³)	0.015		OV/HEPA	Unknown Filter Effectiveness Low Odor Threshold	Requires both filters. Can exist as both particulate and vapor.
Naphthalene diisocyanate	3173-72-6	1,5-Diisocyanatonaphthalene; 1,5-Naphthalene diisocyanate; 1,5-Naphthalene ester of isocyanic acid; NDI		0.040 mg/m ³ (0.005 ppm) C 0.170 mg/m ³ (0.020 ppm) [10-minute]	None	Not established		OV/HEPA	Unknown Filter Effectiveness Unknown Odor Threshold	Requires both filters.
alpha-Naphthylamine	134-32-7	1-Aminonaphthalene, 1-Naphthylamine		Ca	Identified as potential occupational Carcinogens	Not established		Not Recommended	Carcinogen Exposure Limit Not Established	
beta-Naphthylamine	91-59-8	2-Aminonaphthalene, 2-Naphthylamine		Ca	Identified as potential occupational Carcinogens	Not established		Not Recommended	Carcinogen Exposure Limit Not Established	
Niax® Catalyst ESN	62765-93-9	None [Note: A mixture of 95% dimethylaminopropionitrile & 5% bis(2-dimethylamino)ethyl ether.]		However, the limited studies to date indicate that these substances have chemical reactivity and mutagenicity similar to acetaldehyde and malonaldehyde. Therefore, NIOSH recommends that careful consideration should be given to reducing exposures to these nine related aldehydes.	However, the limited studies to date indicate that these substances have chemical reactivity and mutagenicity similar to acetaldehyde and malonaldehyde. Therefore, NIOSH recommends that careful consideration should be given to reducing exposures to these nine related aldehydes.	Not established		Not Recommended	Unknown Filter Effectiveness Exposure Limits Not Established	
Nickel carbonyl	13463-39-3	Nickel tetracarbonyl, Tetracarbonyl nickel		Ca TWA 0.001 ppm (0.007 mg/m ³)	TWA 0.001 ppm (0.007 mg/m ³)	0.5-3.0		Not Recommended	Carcinogen	Extremely low exposure limit
Nickel metal and other compounds (as Ni)	7440-02-0	Nickel metal: Elemental nickel, Nickel catalyst.		Ca TWA 0.015 mg/m ³ [*Note: The REL does not apply to Nickel carbonyl.]	TWA 1 mg/m ³ [*Note: The PEL does not apply to Nickel carbonyl.]	Not established		HEPA	Carcinogen	
Nicotine	54-11-5	3-(1-Methyl-2-pyrrolidyl)pyridine		0.5 mg/m ³ [skin]	0.5 mg/m ³ [skin]	Not established		OV/HEPA	Unknown Odor Threshold and Filter Effectiveness	Requires both filters.

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Nitric acid	7697-37-2	Aqua fortis, Engravers acid, Hydrogen nitrate, Red fuming nitric acid (RFNA), White fuming nitric acid	☑	2 ppm (5 mg/m ³) ST 4 ppm (10 mg/m ³)	2 ppm (5 mg/m ³)	0.267	12.5	AG		Must keep concentrations low.
Nitric oxide	10102-43-9	Mononitrogen monoxide, Nitrogen monoxide	⊘	25 ppm (30 mg/m ³)	25 ppm (30 mg/m ³)	0.3600 mg/cu		Not Recommended		Carbon filters are not an effective sorbent.
p-Nitroaniline	100-01-6	para-Aminonitrobenzene, 4-Nitroaniline, 4-Nitrobenzenamine, p-Nitrophenylamine, PNA	⚠	3 mg/m ³ [skin]	6 mg/m ³ (1 ppm) [skin]	Not established		OV/HEPA	Unknown Odor Threshold Unknown Filter Effectiveness	Requires both filters.
Nitrobenzene	98-95-3	Essence of mirbane, Nitrobenzol, Oil of mirbane	⚠	1 ppm (5 mg/m ³) [skin]	1 ppm (5 mg/m ³) [skin]	0.044	51.3	OV	Low Odor Threshold	
4-Nitrobiphenyl	92-93-3	p-Nitrobiphenyl, p-Nitrodiphenyl, 4-Nitrodiphenyl, p-Phenylnitrobenzene, 4-Phenylnitrobenzene, PNB	⊘	Ca	Identified as Potential occupational Carcinogens	Not established		Not Recommended	Carcinogen Exposure Limit Not Established Unknown Filter Effectiveness	
p-Nitrochlorobenzene	100-00-5	p-Chloronitrobenzene, 4-Chloronitrobenzene, 1-Chloro-4-nitrobenzene, 4-Nitrochlorobenzene, PCNB, PNCB	⚠	Ca	1 mg/m ³ [skin]	Not established		OV/HEPA	Carcinogen Unknown Odor Warning	Requires both filters.
Nitroethane	79-24-3	Nitroetan	☑	100 ppm (310 mg/m ³)	100 ppm (310 mg/m ³)	2.11	8	OV		
Nitrogen dioxide	10102-44-0	Dinitrogen tetroxide (N ₂ O ₄), Nitrogen peroxide	⊘	ST 1 ppm (1.8 mg/m ³)	C 5 ppm (9 mg/m ³)	0.186		Not Recommended		Carbon filters are not an effective sorbent.
Nitrogen trifluoride	7783-54-2	Nitrogen fluoride, Trifluorammine, Trifluorammonia	⊘	10 ppm (29 mg/m ³)	10 ppm (29 mg/m ³)	1475 mg/m ³		Not Recommended		Carbon filters are not an effective sorbent.
Nitroglycerine	55-63-0	Glyceryl trinitrate; NG; 1,2,3-Propanetriol trinitrate; Trinitroglycerine	⊘	ST 0.1 mg/m ³ [skin]	C 0.2 ppm (2 mg/m ³) [skin]	Not established		Not Recommended		Highly explosive and toxic.
Nitromethane	75-52-5	Nitrocarbol	☑	None	100 ppm (250 mg/m ³)	3.5	2.1	OV		
2-Nitronaphthalene	581-89-5	beta-Nitronaphthalene	⊘	Ca	None			Not Recommended	Carcinogen Exposure Limit Not Established	
1-Nitropropane	108-03-2	Nitropropane, 1-NP	☑	25 ppm (90 mg/m ³)	25 ppm (90 mg/m ³)	7.09	16.7	OV		
2-Nitropropane	79-46-9	Dimethylnitromethane, iso-Nitropropane, 2-NP	⚠	Ca	25 ppm (90 mg/m ³)	4.85	14.3	OV	Carcinogen	
N-Nitrosodimethylamine	62-75-9	Dimethylnitrosamine; N,N-Dimethylnitrosamine; DMNA; N-Methyl-N-nitroso-methanamine; NDMA; N-Nitroso-N,N-dimethylamine	⊘	Ca	Identified as Potential occupational Carcinogens	Not established		Not Recommended	Carcinogen Exposure Limit Not Established Unknown Filter Effectiveness	
m-Nitrotoluene	99-08-1	m-Methylnitrobenzene, 3-Methylnitrobenzene, meta-Nitrotoluene, 3-Nitrotoluene	☑	2 ppm (11 mg/m ³) [skin]	5 ppm (30 mg/m ³) [skin]	1.74	51.6	OV/HEPA		Requires both filters.

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CHEMICAL NAME	CAS No.	Synonyms		United States Exposure Limits (TWA) NIOSH	United States Exposure Limits (TWA) OSHA	Odor Threshold (ppm)	Filter Capacity (% weight @ 10ppm)	Filter Type	Warnings	Notes
o-Nitrotoluene	88-72-2	o-Methylnitrobenzene, 2-Methylnitrobenzene, ortho-Nitrotoluene, 2-Nitrotoluene		2 ppm (11 mg/m ³) [skin]	5 ppm (30 mg/m ³) [skin]	0.05mg/l	52.1	OV/HEPA	Low Odor Threshold	Requires both filters.
p-Nitrotoluene	99-99-0	p-Methylnitrobenzene, 4-Methylnitrobenzene, para-Nitrotoluene, 4-Nitrotoluene		2 ppm (11 mg/m ³) [skin]	5 ppm (30 mg/m ³) [skin]	Not established		OV/HEPA	Unknown Odor Threshold Unknown Filter Effectiveness	
Nitrous oxide	10024-97-2	Dinitrogen monoxide, Hyponitrous acid anhydride, Laughing gas		25 ppm (46 mg/m ³)	None	Not established		Not Recommended	Unknown Odor Threshold Unknown Filter Effectiveness	Carbon filters are not an effective sorbent.
Nonane	111-84-2	n-Nonane, Nonyl hydride		200 ppm (1050 mg/m ³)	None	1.26	23	OV		
1-Nonanethiol	1455-21-6	1-Mercaptononane, n-Nonyl mercaptan, Nonylthiol		C 0.5 ppm (3.3 mg/m ³) [15-minute]	None	Not established	40.1	OV		
Octachloronaphthalene	2234-13-1	Halowax® 1051; 1,2,3,4,5,6,7,8-Octachloronaphthalene; Perchloronaphthalene		0.1 mg/m ³ ST 0.3 mg/m ³ [skin]	0.1 mg/m ³ [skin]	Not established		OV/HEPA	Unknown Odor Threshold Unknown Filter Effectiveness	Requires both filters. May exist in both vapor and particulate phases.
1-Octadecanethiol	2885-00-9	1-Mercaptooctadecane, Octadecyl mercaptan, Stearyl mercaptan		C 0.5 ppm (5.9 mg/m ³) [15-minute]	None	Not established		OV/HEPA	Unknown Filter Effectiveness	Requires both filters.
Octane	111-65-9	n-Octane, normal-Octane		75 ppm (350 mg/m ³) C 385 ppm (1800 mg/m ³) [15-minute]	500 ppm (2350 mg/m ³)	5.75	17.5	OV		
1-Octanethiol	111-88-6	1-Mercaptooctane, n-Octyl mercaptan, Octylthiol, 1-Octylthiol		C 0.5 ppm (3.0 mg/m ³) [15-minute]	None		37.9	OV	Unknown Odor Threshold	
Oil mist (mineral)	8012-95-1	Heavy mineral oil mist, Paraffin oil mist, White mineral oil mist		5 mg/m ³ ST 10 mg/m ³	5 mg/m ³	Not established		OV/HEPA	Unknown Filter Effectiveness	Requires both filters. Organic vapor filter to remove other odors.
Osmium tetroxide	20816-12-0	Osmic acid anhydride, Osmium oxide		0.002 mg/m ³ (0.0002 ppm) ST 0.006 mg/m ³ (0.0006 ppm)	0.002 mg/m ³	0.002		Not Recommended	Unknown Filter Effectiveness	Highly toxic.
Oxalic acid	144-62-7	Ethanedioic acid, Oxalic acid (aqueous), Oxalic acid dihydrate		1 mg/m ³ ST 2 mg/m ³	1 mg/m ³	Odorless		OV/HEPA		Requires both filters.
Oxygen difluoride	7783-41-7	Difluorine monoxide, Fluorine monoxide, Oxygen fluoride		C 0.05 ppm (0.1 mg/m ³)	0.05 ppm (0.1 mg/m ³)	0.098		Not Recommended	Unknown Filter Effectiveness	Highly toxic.
Ozone	10028-15-6	Triatomic oxygen		C 0.1 ppm (0.2 mg/m ³)	0.1 ppm (0.2 mg/m ³)	0.051		Not Recommended		Carbon filters are not an effective sorbent.
Paraffin wax fume	8002-74-2	Paraffin fume, Paraffin scale fume		2 mg/m ³	None	Not established		OV/HEPA	Unknown Odor Threshold	Requires both filters. Organic vapor filter to remove other odors.
Paraquat (Paraquat dichloride)	1910-42-5	1,1'-Dimethyl-4,4'-bipyridinium dichloride; N,N'-Dimethyl-4,4'-bipyridinium dichloride; Paraquat chloride; Paraquat dichloride [Note: Paraquat is a cation (C ₁₂ H ₁₄ N ₂ ⁺⁺ ; 1,1-Dimethyl-4,4-bipyridinium ion); the commercial product is the dichloride salt of paraquat.]		0.1 mg/m ³ (resp) [skin]	0.5 mg/m ³ (resp) [skin]	Not established		OV/HEPA	Unknown Filter Effectiveness Unknown Odor Threshold	Filter capacity unknown when fumes emitted.

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Parathion	56-38-2	O,O-Diethyl-O(p-nitrophenyl) phosphorothioate; Diethyl parathion; Ethyl parathion; Parathion-ethyl		0.05 mg/m ³ [skin]	0.1 mg/m ³ [skin]	0.04		OV/HEPA	Unknown Filter Effectiveness Poor Odor Warning Low Odor Threshold	
Pentaborane	19624-22-7	Pentaboron nonahydride		0.005 ppm (0.01 mg/m ³) ST 0.015 ppm (0.03 mg/m ³)	0.005 ppm (0.01 mg/m ³)	0.97		Not Recommended	Unknown Filter Effectiveness	Highly toxic.
Pentachloroethane	76-01-7	Ethane pentachloride, Pentalin		Handle with care in the workplace because of their structural similarity to the four chloroethanes shown to be carcinogenic in animals	None	Not established	58.2	OV	Unknown Odor Threshold	Potential occupational carcinogen.
Pentachloronaphthalene	1321-64-8	Halowax® 1013; 1,2,3,4,5-Pentachloronaphthalene		0.5 mg/m ³ [skin]	0.5 mg/m ³ [skin]	Not established		OV/HEPA	Unknown Odor Threshold Unknown Filter Effectiveness	Requires both filters. May exist in both vapor and particulate phases.
Pentachlorophenol	87-86-5	PCP; Penta; 2,3,4,5,6-Pentachlorophenol		0.5 mg/m ³ [skin]	0.5 mg/m ³ [skin]	Not established		OV/HEPA	Unknown Odor Threshold Unknown Filter Effectiveness	Requires both filters. May exist in both vapor and particulate phases.
Pentaerythritol	115-77-5	2,2-bis(Hydroxymethyl)-1,3-propanediol; Methane tetramethylol; Monopentaerythritol; PE; Tetrahydroxymethylolmethane; Tetramethylolmethane		10 mg/m ³ (total) TWA 5 mg/m ³ (resp)	15 mg/m ³ (total) TWA 5 mg/m ³ (resp)	Odorless		HEPA		
n-Pentane	109-66-0	Pentane, normal-Pentane		120 ppm (350 mg/m ³) C 610 ppm (1800 mg/m ³) [15-minute]	1000 ppm (2950 mg/m ³)	31.6	5.7	OV		
1-Pentanethiol	110-66-7	Amyl hydrosulfide, Amyl mercaptan, Amyl sulfhydrate, Pentyl mercaptan		C 0.5 ppm (2.1 mg/m ³) [15-minute]	None	Not established	23.7	OV	Unknown Odor Threshold	
2-Pentanone	107-87-9	Ethyl acetone, Methyl propyl ketone, MPK		150 ppm (530 mg/m ³)	200 ppm (700 mg/m ³)	1.55	13.3	OV		
Perchloromethyl mercaptan	594-42-3	PCM, PMM, Trichloromethane sulfenyl chloride, Trichloromethyl sulfur chloride		0.1 ppm (0.8 mg/m ³)	0.1 ppm (0.8 mg/m ³)	0.097		Not Recommended	Low Odor Threshold	Odoriferous at extremely low levels.
Perchloryl fluoride	7616-94-6	Chlorine fluoride oxide, Chlorine oxyfluoride, Trioxchlorofluoride		3 ppm (14 mg/m ³) ST 6 ppm (28 mg/m ³)	3 ppm (13.5 mg/m ³)	11		Not Recommended		Carbon filters are not an effective sorbent.
Perlite	93763-70-3	Expanded perlite [Note: An amorphous material consisting of fused sodium potassium aluminum silicate.]		10 mg/m ³ (total) TWA 5 mg/m ³ (resp)	15 mg/m ³ (total) TWA 5 mg/m ³ (resp)	Not established		HEPA		
Petroleum distillates (naphtha)	8002-05-9	Aliphatic petroleum naphtha, Petroleum naphtha, Rubber solvent		350 mg/m ³ C 1800 mg/m ³ [15-minute]	500 ppm (2000 mg/m ³)	Not established		OV	Unknown Odor Threshold Unknown Filter Effectiveness	Variable odors.
Phenol	108-95-2	Carbolic acid, Hydroxybenzene, Monohydroxybenzene, Phenyl alcohol, Phenyl hydroxide		5 ppm (19 mg/m ³) C 15.6 ppm (60 mg/m ³) [15-minute] [skin]	5 ppm (19 mg/m ³) [skin]	0.011	35.4	OV/HEPA	Low Odor Threshold	Requires both filters. Odoriferous at extremely low levels.

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Phenothiazine	92-84-2	Dibenzothiazine, Fenothiazine, Thiodiphenylamine		5 mg/m ³ [skin]	None	Not established		Not Recommended	Unknown Filter Effectiveness	
p-Phenylene diamine	106-50-3	4-Aminoaniline; 1,4-Benzenediamine; p-Diaminobenzene; 1,4-Diaminobenzene; 1,4-Phenylene diamine		0.1 mg/m ³ [skin]	0.1 mg/m ³ [skin]	Not established		OV/HEPA	Unknown Filter Effectiveness Unknown Odor Threshold	Requires both filters.
Phenyl ether (vapor)	101-84-8	Diphenyl ether, Diphenyl oxide, Phenoxy benzene, Phenyl oxide		1 ppm (7 mg/m ³)	1 ppm (7 mg/m ³)	0.03	17.8	OV/HEPA	Low Odor Threshold	Requires both filters.
Phenyl ether-biphenyl mixture (vapor)	8004-13-5	Diphenyl oxide-diphenyl mixture; Dowtherm® A		1 ppm (7 mg/m ³)	1 ppm (7 mg/m ³)	0.001-0.01		OV/HEPA	Unknown Filter Effectiveness	Requires both filters.
Phenyl glycidyl ether	122-60-1	1,2-Epoxy-3-phenoxy propane; Glycidyl phenyl ether; PGE; Phenyl 2,3-epoxypropyl ether		Ca C 1 ppm (6 mg/m ³) [15-minute]	10 ppm (60 mg/m ³)	Not established	17	OV	Carcinogen Unknown Odor Threshold	
Phenylhydrazine	100-63-0	Hydrazinobenzene, Monophenylhydrazine		Ca C 0.14 ppm (0.6 mg/m ³)	5 ppm (22 mg/m ³)	Not established	53.7	OV	Carcinogen Unknown Odor Threshold	
N-Phenyl-beta-naphthylamine	135-88-6	2-Anilinonaphthalene, beta-Naphthylphenylamine, PBNA, 2-Phenylaminonaphthalene, Phenyl-beta-naphthylamine		Ca [Note: Since metabolized to beta-Naphthylamine]	None	Not established		Not recommended	Carcinogen Unknown Odor Threshold Unknown Filter Effectiveness	
Phenylphosphine	638-21-1	Fenylfosfin, PF, Phosphaniline		C 0.05 ppm (0.25 mg/m ³)	None	Not established		OV	Unknown Odor Threshold Unknown Filter Effectiveness	Highly toxic.
Phorate	298-02-2	O,O-Diethyl S-(ethylthio) methylphosphorodithioate; O,O-Diethyl S-ethylthiomethylthiothionophosphate; Thimet; Timet		0.05 mg/m ³ ST 0.2 mg/m ³ [skin]	None	Not established		Not recommended	Unknown Filter Effectiveness Unknown Odor Threshold	
Phosdrin®	7786-34-7	2-Carbomethoxy-1-methylvinyl dimethyl phosphate, Mevinphos [Note: Commercial product is a mixture of the cis- & trans-isomers.]		0.01 ppm (0.1 mg/m ³) ST 0.03 ppm (0.3 mg/m ³) [skin]	0.1 mg/m ³ [skin]	Not established		Not recommended	Unknown Odor Threshold Unknown Filter Effectiveness	
Phosgene	75-44-5	Carbon oxychloride, Carbonyl chloride, Carbonyl dichloride, Chloroformyl chloride		0.1 ppm (0.4 mg/m ³) C 0.2 ppm (0.8 mg/m ³) [15-minute]		0.55		Not recommended	Short Filter Life Poor Odor Warning	Very short AG filter life. This chemical warfare gas is very toxic.
Phosphine	7803-51-2	Hydrogen phosphide, Phosphorated hydrogen, Phosphorus hydride, Phosphorus trihydride		0.3 ppm (0.4 mg/m ³) ST 1 ppm (1 mg/m ³)	0.3 ppm (0.4 mg/m ³)	0.14		Not recommended	Unknown Filter Effectiveness	Used as a fumigant.
Phosphoric acid	7664-38-2	Orthophosphoric acid, Phosphoric acid (aqueous), White phosphoric acid		1 mg/m ³ ST 3 mg/m ³	1 mg/m ³	Odorless	11	AG / HEPA	Unknown Odor Threshold	Requires both filters.
Phosphorus oxychloride	10025-87-3	Phosphorus chloride, Phosphorus oxytrichloride, Phosphoryl chloride		0.1 ppm (0.6 mg/m ³) ST 0.5 ppm (3 mg/m ³)	None	Not established		AG	Unknown Odor Threshold Unknown Filter Effectiveness	
Phosphorus pentachloride	10026-13-8	Pentachlorophosphorus, Phosphoric chloride, Phosphorus perchloride		1 mg/m ³	1 mg/m ³	Not established		AG/HEPA	Unknown Odor Threshold Unknown Filter Effectiveness	Requires both filters.

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Phosphorus pentasulfide	1314-80-3	Phosphorus persulfide, Phosphorus sulfide, Sulfur phosphide		1 mg/m ³ ST 3 mg/m ³	1 mg/m ³	0.00471		Not recommended	Unknown Odor Threshold Unknown Filter Effectiveness	High concentrations can paralyze the sense of smell.
Phosphorus trichloride	7719-12-2	Phosphorus chloride		0.2 ppm (1.5 mg/m ³) ST 0.5 ppm (3 mg/m ³)	0.5 ppm (3 mg/m ³)	Not established		AG	Unknown Odor Threshold Unknown Filter Effectiveness	
Phosphorus (yellow)	7723-14-0	Elemental phosphorus, White phosphorus		0.1 mg/m ³	0.1 mg/m ³	Not established		Not recommended		Igites spontaneously in air.
Phthalic anhydride	85-44-9	1,2-Benzenedicarboxylic anhydride; PAN; Phthalic acid anhydride		6 mg/m ³ (1 ppm)	12 mg/m ³ (2 ppm)	0.052		OV/HEPA	Unknown Filter Effectiveness Low Odor Threshold	Requires both filters.
m-Phthalodinitrile	626-17-5	1,3-Benzenedicarbonitrile; m-Dicyanobenzene; 1,3-Dicyanobenzene; Isophthalodinitrile; m-PDN		5 mg/m ³	None	Not established		HEPA		
Picloram	1918-02-1	4-Amino-3,5,6-trichloropicolinic acid; 4-Amino-3,5,6-trichloro-2-picolinic acid; ATCP; Tordon®		Not established REL's -a limited evaluation of the literature and concluded that the documentation cited by OSHA was inadequate to support the proposed PEL (as an 8-hour TWA) of 10 mg/m ³ for alpha-alumina, benomyl, emery, glycerine (mist), graphite (synth)	15 mg/m ³ (total) TWA 5 mg/m ³ (resp)	Not established		Not recommended		
Picric acid	88-89-1	Phenol trinitrate; 2,4,6-Trinitrophenol [Note: An OSHA Class A Explosive (1910.109).]		0.1 mg/m ³ ST 0.3 mg/m ³ [skin]	0.1 mg/m ³ [skin]	0.0005 mg/m ³		HEPA		
Pindone	83-26-1	tert-Butyl valone; 1,3-Dioxo-2-pivaloylindane; Pival®; Pivalyl; 2-Pivalyl-1,3-indandione		0.1 mg/m ³	0.1 mg/m ³	Not established		HEPA		
Piperazine dihydrochloride	142-64-3	Piperazine hydrochloride [Note: The monochloride, C ₄ H ₁₀ N ₂ HCl, is also commercially available.]				Not established		HEPA		
Plaster of Paris	26499-65-0	Calcium sulfate hemihydrate, Dried calcium sulfate, Gypsum hemihydrate, Hemihydrate gypsum		10 mg/m ³ (total) TWA 5 mg/m ³ (resp)	15 mg/m ³ (total) TWA 5 mg/m ³ (resp)	Not established		HEPA		
Platinum	7440-06-4	Platinum black, Platinum metal, Platinum sponge		1 mg/m ³	None	Not established		HEPA		
Platinum (soluble salts, as Pt)		Synonyms vary depending upon the specific soluble platinum salt		0.002 mg/m ³	0.002 mg/m ³	Not established		HEPA	Low exposure limit.	
Portland cement	65997-15-1	Cement, Hydraulic cement, Portland cement silicate		10 mg/m ³ (total) TWA 5 mg/m ³ (resp)	50 mppcf	Not established		HEPA		

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Potassium cyanide (as CN)	151-50-8	Potassium salt of hydrocyanic acid	☒	C 5 mg/m ³ (4.7 ppm) [10-minute] [*Note: The REL also applies to other cyanides (as CN) except Hydrogen cyanide.]	5 mg/m ³ [*Note: The PEL also applies to other cyanides (as CN) except Hydrogen cyanide.]	Not established		Not recommended	Unknown Odor Threshold Unknown Filter Effectiveness	Cyanide.
Potassium hydroxide	1310-58-3	Caustic potash, Lye, Potassium hydrate	☑	C 2 mg/m ³	None	Odorless		HEPA		
Propane	74-98-6	Bottled gas, Dimethyl methane, n-Propane, Propyl hydride	☒	1000 ppm (1800 mg/m ³)	1000 ppm (1800 mg/m ³)	2,690.00	0.5	Not recommended	Poor Odor Warning Short Filter Life	
Propane sulfone	1120-71-4	3-Hydroxy-1-propanesulphonic acid sultone; 1,3-Propane sulfone	☒	Ca	None	Not established		Not recommended	Carcinogen Unknown Odor Threshold Unknown Filter Effectiveness	
1-Propanethiol	107-03-9	3-Mercaptopropane, Propane-1-thiol, Propyl mercaptan, n-Propyl mercaptan	☒	C 0.5 ppm (1.6 mg/m ³) [15-minute]	None	“.00075”		Not recommended	Low Odor Threshold Unknown Filter Effectiveness	
Propargyl alcohol	107-19-7	1-Propyn-3-ol; 2-Propyn-1-ol; 2-Propynyl alcohol	⚠	1 ppm (2 mg/m ³) [skin]	None	0.015	5.7	OV	Low Odor Threshold	
beta-Propiolactone	57-57-8	BPL; Hydroacrylic acid, beta-lactone; 3-Hydroxy-beta-lactone; 3-Hydroxy-propionic acid; beta-Lactone; 2-Oxetanone; 3-Propiolactone	⚠	Ca	Identified as Potential occupational Carcinogens	Not established		OV	Carcinogen Unknown Filter Effectiveness Unknown Odor Threshold	
Propionic acid	79-09-4	Carboxyethane, Ethanecarboxylic acid, Ethylformic acid, Metacetic acid, Methyl acetic acid, Propanoic acid	⚠	10 ppm (30 mg/m ³) ST 15 ppm (45 mg/m ³)	None	0.037	14.9	OV	Low Odor Threshold	
Propionitrile	107-12-0	Cyanoethane, Ethyl cyanide, Propanenitrile, Propionic nitrile, Propionitrile	⚠	6 ppm (14 mg/m ³)	None	Not established	3.5	OV	Unknown Odor Threshold	Forms cyanide in the body.
Propoxur	114-26-1	Aprocarb®; o-Isopropoxyphenyl-N-methylcarbamate; N-Methyl-2-isopropoxyphenyl-carbamate	☒	0.5 mg/m ³	None	Not established		Not recommended	Unknown Filter Effectiveness Unknown Odor Threshold	
n-Propyl acetate	109-60-4	Propylacetate, n-Propyl ester of acetic acid	☑	200 ppm (840 mg/m ³) ST 250 ppm (1050 mg/m ³)	200 ppm (840 mg/m ³)	0.575	16.8	OV		
n-Propyl alcohol	71-23-8	Ethyl carbinol, 1-Propanol, n-Propanol, Propyl alcohol	☑	200 ppm (500 mg/m ³) ST 250 ppm (625 mg/m ³) [skin]	200 ppm (500 mg/m ³)	30	6.6	OV		
Propylene dichloride	78-87-5	Dichloro-1,2-propane; 1,2-Dichloropropane	⚠	Ca	75 ppm (350 mg/m ³)	0.851	17.8	OV	Carcinogen	
Propylene glycol dinitrate	6423-43-4	PGDN; Propylene glycol-1,2-dinitrate; 1,2-Propylene glycol dinitrate	⚠	0.05 ppm (0.3 mg/m ³) [skin]	None	0.231		OV	Unknown Filter Effectiveness Poor Odor Warning	

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Propylene glycol monomethyl ether	107-98-2	Dowtherm® 209; 1-Methoxy-2-hydroxypropane; 1-Methoxy-2-propanol; 2-Methoxy-1-methylethanol; Propylene glycol methyl ether		100 ppm (360 mg/m ³) ST 150 ppm (540 mg/m ³)	None	0.003		OV	Unknown Filter Effectiveness Low Odor Threshold	
Propylene imine	75-55-8	2-Methylaziridine, 2-Methylethyleneimine, Propyleneimine, Propylene imine (inhibited), Propylenimine		Ca TWA 2 ppm (5 mg/m ³) [skin]	2 ppm (5 mg/m ³) [skin]	Not established	3	OV	Carcinogen Unknown Odor Threshold	
Propylene oxide	75-56-9	1,2-Epoxy propane; Methyl ethylene oxide; Methyloxirane; Propene oxide; 1,2-Propylene oxide		Ca	100 ppm (240 mg/m ³)	33.1	1.2	OV	Carcinogen Poor Odor Warning Short Filter Life	
n-Propyl nitrate	627-13-4	Propyl ester of nitric acid		25 ppm (105 mg/m ³) ST 40 ppm (170 mg/m ³)	25 ppm (110 mg/m ³)	50		OV	Poor Odor Warning Unknown Filter Effectiveness	
Putrescine	110-60-1	1,4-diaminobutane, Butanediamine		None	None		10	OV/HEPA	Unknown Odor Threshold	Melting point is 27°C. Produced by the breakdown of amino acids in living and dead organisms.
Pyrethrum	8003-34-7	Cinerin I or II, Jasmolin I or II, Pyrethrin I or II, Pyrethrum I or II [Note: Pyrethrum is a variable mixture of Cinerin, Jasmolin, and Pyrethrin.]		5 mg/m ³	5 mg/m ³	Not established		OV/HEPA	Unknown Odor Threshold Unknown Filter Effectiveness	Requires both filters.
Pyridine	110-86-1	Azabenzene, Azine		5 ppm (15 mg/m ³)	5 ppm (15 mg/m ³)	0.17	16	OV		Nauseating, fish-like odor.
Quinone	106-51-4	1,4-Benzoquinone; p-Benzoquinone; 1,4-Cyclohexadiene dioxide; p-Quinone		0.4 mg/m ³ (0.1 ppm)	0.4 mg/m ³ (0.1 ppm)	0.012		OV/HEPA	Unknown Filter Effectiveness Low Odor Threshold	Requires both filters.
Resorcinol	108-46-3	1,3-Benzenediol; m-Benzenediol; 1,3-Dihydroxybenzene; m-Dihydroxybenzene; 3-Hydroxyphenol; m-Hydroxyphenol		10 ppm (45 mg/m ³) ST 20 ppm (90 mg/m ³)	None	Not established		HEPA		OV and HEPA may be preferable when heat is involved.
Rhodium (metal fume and insoluble compounds, as Rh)	7440-16-6	Rhodium metal; Elemental rhodium		0.1 mg/m ³	0.1 mg/m ³	Not established		HEPA		
Rhodium (soluble compounds, as Rh)		Synonyms vary depending upon the specific soluble rhodium compound		0.001 mg/m ³	0.001 mg/m ³	Not established		HEPA		
Ronnel	299-84-3	O,O-Dimethyl O-(2,4,5-trichlorophenyl) phosphorothioate; Fenchlorophos		10 mg/m ³	15 mg/m ³	Not established		OV/HEPA	Unknown Odor Threshold Unknown Filter Effectiveness	Requires both filters.
Rosin core solder, pyrolysis products (as formaldehyde)		Rosin flux pyrolysis products, Rosin core soldering flux pyrolysis products		0.1 mg/m ³ [*Note: "Ca" in the presence of formaldehyde, acetaldehyde, or malonaldehyde. See Appendices A & C (Aldehydes).]	None	Not established		OV/HEPA	Unknown Odor Threshold Unknown Filter Effectiveness	Requires both filters.

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CHEMICAL NAME	CAS No.	Synonyms		United States Exposure Limits (TWA) NIOSH	United States Exposure Limits (TWA) OSHA	Odor Threshold (ppm)	Filter Capacity (% weight @ 10ppm)	Filter Type	Warnings	Notes
Rotenone	83-79-4	1,2,12,12a-Tetrahydro-8,9-dimethoxy-2-(1-methyl-ethenyl)-[1]benzopyrano [3,4-b]furo[2,3-h][1] benzopyran-6(6aH)-one		5 mg/m ³	5 mg/m ³	Not established		OV/HEPA	Unknown Odor Threshold Unknown Filter Effectiveness	Requires both filters.
Rouge	1309-37-1	Iron(III)oxide, Iron oxide red, Red iron oxide, Red oxide		Not established REL's -a limited evaluation of the literature and concluded that the documentation cited by OSHA was inadequate to support the proposed PEL (as an 8-hour TWA) of 10 mg/m ³ for alpha-alumina, benomy, emery, glycerine (mist), graphite (synth)	15 mg/m ³ (total) TWA 5 mg/m ³ (resp)	Not established		HEPA		
Selenium	7782-49-2	Elemental selenium, Selenium alloy		0.2 mg/m ³ [*Note: The REL also applies to other selenium compounds (as Se) except Selenium hexafluoride.]	0.2 mg/m ³ [*Note: The PEL also applies to other selenium compounds (as Se) except Selenium hexafluoride]	Not established		HEPA		
Selenium hexafluoride	7783-79-1	Selenium fluoride		0.05 ppm	0.05 ppm (0.4 mg/m ³)	Not established		Not recommended	Unknown Filter Effectiveness Unknown Odor Threshold	Highly toxic.
Silica, amorphous	7631-86-9	Diatomaceous earth, Diatomaceous silica, Diatomite, Precipitated amorphous silica, Silica gel, Silicon dioxide (amorphous)		6 mg/m ³	20 mppcf (80 mg/m ³ /%SiO ₂)	Not established		HEPA		
Silica, crystalline (as respirable dust)	14808-60-7	Cristobalite, Quartz, Tridymite, Tripoli		Ca TWA 0.05 mg/m ³	30 mg/m ³ divided by the value "%SiO ₂ + 2	Not established		HEPA	Carcinogen	
Silicon	7440-21-3	Elemental silicon [Note: Does not occur free in nature, but is found in silicon dioxide (silica) & in various silicates		10 mg/m ³ (total) TWA 5 mg/m ³ (resp)	15 mg/m ³ (total) TWA 5 mg/m ³ (resp)	Not established		HEPA		
Silicon carbide	409-21-2	Carbon silicide; Carborundum®; Silicon monocarbide		10 mg/m ³ (total) TWA 5 mg/m ³ (resp)	15 mg/m ³ (total) TWA 5 mg/m ³ (resp)	Not established		HEPA		
Silicon tetrahydride	7803-62-5	Monosilane, Silane, Silicane		5 ppm (7 mg/m ³)	None	Not established		Not recommended	Unknown Filter Effectiveness Unknown Odor Threshold	
Silver (metal dust and soluble compounds, as Ag)	7440-22-4	Silver metal: Argentum		0.01 mg/m ³	0.01 mg/m ³	Not established		HEPA		
Soapstone (containing less than 1% quartz)		Massive talc, Soapstone silicate, Steatite		6 mg/m ³ (total) TWA 3 mg/m ³ (resp)	20 mppcf	Not established		HEPA		
Sodium aluminum fluoride (as F)	15096-52-3	Cryocide, Cryodust, Cryolite, Sodium hexafluoroaluminate		2.5 mg/m ³ [*Note: The REL also applies to other inorganic, solid fluorides	2.5 mg/m ³ [*Note: The REL also applies to other inorganic, solid fluorides	Not established		AG/HEPA	Unknown Odor Threshold Unknown Filter Effectiveness	Requires both filters.

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Sodium azide	26628-22-8	Azide, Azium, Sodium salt of hydrazoic acid		C 0.1 ppm (as HN ₃) [skin] C 0.3 mg/m ³ (as NaN ₃) [skin]	None	Odorless		HEPA	Unknown Odor Threshold	Not recommended when forms hydrazoic acid in water.
Sodium bisulfite	7631-90-5	Monosodium salt of sulfurous acid, Sodium acid bisulfite, Sodium bisulphite, Sodium hydrogen sulfite		5 mg/m ³	None	Not established		AG/HEPA	Unknown Filter Effectiveness Unknown Odor Threshold	Requires both filters.
Sodium cyanide (as CN)	143-33-9	Sodium salt of hydrocyanic acid		C 5 mg/m ³ (4.7 ppm) [10-minute] [*Note: The REL also applies to other cyanides (as CN) except Hydrogen cyanide.]	5 mg/m ³ [*Note: The PEL also applies to other cyanides (as CN) except Hydrogen cyanide.]	Not established		Not recommended	Unknown Filter Effectiveness Unknown Odor Threshold	
Sodium fluoride (as F)	7681-49-4	Fluorine, Sodium monofluoride		2.5 mg/m ³ [*Note: The REL also applies to other inorganic, solid fluorides (as F).]	2.5 mg/m ³ [*Note: The REL also applies to other inorganic, solid fluorides (as F).]	Not established		AG/HEPA	Unknown Odor Threshold Unknown Filter Effectiveness	Requires both filters.
Sodium fluoroacetate	62-74-8	SFA, Sodium monofluoroacetate		0.05 mg/m ³ ST 0.15 mg/m ³ [skin]	0.05 mg/m ³ [skin]	Not established		HEPA		
Sodium hydroxide	1310-73-2	Caustic soda, Lye, Soda lye, Sodium hydrate		C 2 mg/m ³	2 mg/m ³	Odorless		HEPA		
Sodium hypochlorite	7681-52-9	Bleach; hypochlorous acid, sodium salt; soda bleach; sodium oxychloride		Not established.	PEL:0.5 ppm (TWA), 1 ppm STEL as Chlorine	Not established		AG	Unknown Odor Threshold Unknown Filter Effectiveness	
Sodium metabisulfite	7681-57-4	Disodium pyrosulfite, Sodium metabisulphite, Sodium pyrosulfite		5 mg/m ³	None	0.5		AG/HEPA	Unknown Filter Effectiveness	Requires both filters.
Starch	9005-25-8	Corn starch, Rice starch, Sorghum gum, alpha-Starch, Starch gum, Tapioca starch		10 mg/m ³ (total) TWA 5 mg/m ³ (resp)	15 mg/m ³ (total) TWA 5 mg/m ³ (resp)	Not established		HEPA		
Stibine	7803-52-3	Antimony hydride, Antimony trihydride, Hydrogen antimonide		0.1 ppm (0.5 mg/m ³)	0.1 ppm (0.5 mg/m ³)	Not established		Not recommended	Unknown Odor Threshold Unknown Filter Effectiveness	Highly toxic.
Stoddard solvent	8052-41-3	Dry cleaning safety solvent, Mineral spirits, Petroleum solvent, Spotting naphtha [Note: A refined petroleum solvent with a flash point of 102-110°F, boiling point of 309-396°F, and containing >65% C10 or higher hydrocarbons.]		350 mg/m ³ C 1800 mg/m ³ [15-minute]	500 ppm (2900 mg/m ³)	"1-30"	11	OV		
Strychnine	57-24-9	Nux vomica, Strychnos		0.15 mg/m ³	0.15 mg/m ³			HEPA		
Styrene	100-42-5	Ethenyl benzene, Phenylethylene, Styrene monomer, Styrol, Vinyl benzene		50 ppm (215 mg/m ³) ST 100 ppm (425 mg/m ³)	100 ppm C 200 ppm 600 ppm (5-minute maximum peak in any 3 hours)	3.44	30	OV		

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Subtilisins	1395-21-7	Bacillus subtilis, Bacillus subtilis BPN, Bacillus subtilis Carlsburg, Proteolytic enzymes, Subtilisin BPN, Subtilisin Carlsburg [Note: Commercial proteolytic enzymes are used in laundry detergents.]	⊘	ST 0.00006 mg/m ³ [60-minute]	None	Not established		Not recommended	Unknown Odor Threshold Unknown Filter Effectiveness	
Succinonitrile	110-61-2	Butanedinitrile; 1,2-Dicyanoethane; Dinile; Ethylene cyanide; Ethylene dicyanide; Succinic dinitrile	⊘	6 ppm (20 mg/m ³)	None	Not established		Not recommended	Unknown Filter Effectiveness Unknown Odor Threshold	Forms cyanide in the body.
Sucrose	57-50-1	Beet sugar, Cane sugar, Confectioner's sugar, Granulated sugar, Rock candy, Saccharose, Sugar, Table sugar	☑	TWA 10 mg/m ³ (total) TWA 5 mg/m ³ (resp)	15 mg/m ³ (total) TWA 5 mg/m ³ (resp)	Odorless		HEPA		
Sulfur dioxide	2551-62-4	Sulfurous acid anhydride, Sulfurous oxide, Sulfur oxide	☑	2 ppm (5 mg/m ³) ST 5 ppm (13 mg/m ³)		0.708	1.7	AG		
Sulfur hexafluoride	2551-62-4	Sulfur fluoride [Note: May contain highly toxic sulfur pentafluoride as an impurity]	⊘	1000 ppm (6000 mg/m ³)	1000 ppm (6000 mg/m ³)	Odorless		Not recommended	Unknown Filter Effectiveness	
Sulfuric acid	7664-93-9	Battery acid, Hydrogen sulfate, Oil of vitriol, Sulfuric acid (aqueous)	☑	1 mg/m ³	1 mg/m ³	>1mg/m ³	13	AG/HEPA		Requires both filters.
Sulfur monochloride	10025-67-9	Sulfur chloride, Sulfur subchloride, Thiosulfurous dichloride	⚠	C 1 ppm (6 mg/m ³)	1 ppm (6 mg/m ³)	0.001		AG	Unknown Filter Effectiveness Low Odor Threshold	
Sulfur pentafluoride	5714-22-7	Disulfur decafluoride, Sulfur decafluoride	⚠	C 0.01 ppm (0.1 mg/m ³)	0.025 ppm (0.25 mg/m ³)	Not established		AG	Unknown Odor Threshold Unknown Filter Effectiveness	Highly toxic.
Sulfur tetrafluoride	7783-60-0	Tetrafluorosulfurane	⚠	C 0.1 ppm (0.4 mg/m ³)	None	Not established		AG	Unknown Odor Threshold Unknown Filter Effectiveness	Highly toxic.
Sulfuryl fluoride	2699-79-8	Sulfur difluoride dioxide, Vikane®	⊘	5 ppm (20 mg/m ³) ST 10 ppm (40 mg/m ³)	5 ppm (20 mg/m ³)	Not established		Not recommended	Unknown Odor Threshold Unknown Filter Effectiveness	
Sulprofos	35400-43-2	Bolstar®, O-Ethyl O-(4-methylthio) phenyl S-propylphosphorodithioate	⊘	1 mg/m ³	None	Not established		Not recommended	Unknown Odor Threshold Unknown Filter Effectiveness	
2, 4, 5-T	93-76-5	2,4,5-Trichlorophenoxyacetic acid	☑	10 mg/m ³	10 mg/m ³	Odorless		HEPA		
Talc (containing no asbestos and less than 1% quartz)	14807-96-6	Hydrous magnesium silicate, Steatite talc	☑	2 mg/m ³ (resp)	20 mppcf	Not established		HEPA		
Tantalum (metal and oxide dust, as Ta)	7440-25-7	Tantalum metal: Tantalum-181	☑	5 mg/m ³ ST 10 mg/m ³	5 mg/m ³	Not established		HEPA		
TEDP	3689-24-5	Bladafum®, Dithion®, Sulfotep, Tetraethyl dithionopyrophosphate, Tetraethyl dithiopyrophosphate, Thiopepp	⊘	0.2 mg/m ³ [skin]	0.2 mg/m ³ [skin]	Not established		Not recommended	Unknown Odor Threshold Unknown Filter Effectiveness	

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Tellurium	13494-80-9	Aurum paradoxum, Metallum problematum	☑	0.1 mg/m ³ [*Note: The REL also applies to other tellurium compounds (as Te) except Tellurium hexafluoride and Bismuth telluride.]	0.1 mg/m ³ [*Note: The REL also applies to other tellurium compounds (as Te) except Tellurium hexafluoride and Bismuth telluride.]	Not established		HEPA		
Tellurium hexafluoride	7783-80-4	Tellurium fluoride	⊘	0.02 ppm (0.2 mg/m ³)	0.02 ppm (0.2 mg/m ³)	Not established		Not recommended	Unknown Odor Threshold Unknown Filter Effectiveness	Highly toxic.
Temephos	3383-96-8	Abate®; Temefos; O,O,O',O'-Tetramethyl O,O'-thiodi-p-phenylene phosphorothioate	☑	10 mg/m ³ (total) TWA 5 mg/m ³ (resp)	15 mg/m ³ (total) TWA 5 mg/m ³ (resp)	Not established		HEPA		
TEPP	107-49-3	Ethyl pyrophosphate, Tetraethyl pyrophosphate, Tetron®	⊘	0.05 mg/m ³ [skin]	0.05 mg/m ³ [skin]	Not established		Not recommended	Unknown Odor Threshold Unknown Filter Effectiveness	
m-Terphenyl	92-06-8	m-Diphenylbenzene; 1,3-Diphenylbenzene; Isodiphenylbenzene; 3-Phenylbiphenyl; 1,3-Terphenyl; meta-Terphenyl; m-Triphenyl	☑	C 5 mg/m ³ (0.5 ppm)	C 9 mg/m ³ (1 ppm)	Not established		HEPA		OV/HEPA may be preferable when heat is involved.
o-Terphenyl	84-15-1	o-Diphenylbenzene; 1,2-Diphenylbenzene; 2-Phenylbiphenyl; 1,2-Terphenyl; ortho-Terphenyl; o-Triphenyl	☑	C 5 mg/m ³ (0.5 ppm)	C 9 mg/m ³ (1 ppm)	Not established		HEPA		OV/HEPA may be preferable when heat is involved.
p-Terphenyl	92-94-4	p-Diphenylbenzene; 1,4-Diphenylbenzene; 4-Phenylbiphenyl; 1,4-Terphenyl; para-Terphenyl; p-Triphenyl	☑	C 5 mg/m ³ (0.5 ppm)	C 9 mg/m ³ (1 ppm)	Not established		HEPA		OV/HEPA may be preferable when heat is involved.
2, 3, 7, 8-Tetrachloro-dibenzo-p-dioxin	1746-01-6	Dioxin; Dioxine; TCDBD; TCDD; 2,3,7,8-TCDD [Note: Formed during past production of 2,4,5-trichlorophenol, 2,4,5-T & 2(2,4,5-trichlorophenoxy)propionic acid.]	⊘	Ca	None	Not established		Not recommended	Carcinogen Unknown Odor Threshold Unknown Filter Effectiveness	
1, 1, 1, 2-Tetrachloro-2,2-difluoroethane	76-11-9	2,2-Difluoro-1,1,1,2-tetrachloroethane; Freon® 112a; Halocarbon 112a; Refrigerant 112a	⚠	500 ppm (4170 mg/m ³)	500 ppm (4170 mg/m ³)	Not established		OV	Unknown Odor Threshold Unknown Filter Effectiveness	
1, 1, 2, 2-Tetrachloro-1,2-difluoroethane	76-12-0	1,2-Difluoro-1,1,2,2-tetrachloroethane; Freon® 112; Halocarbon 112; Refrigerant 112	⚠	500 ppm (4170 mg/m ³)	500 ppm (4170 mg/m ³)	Not established		OV	Unknown Odor Threshold Unknown Filter Effectiveness	
1, 1, 1, 2-Tetrachloroethane	630-20-6	None	⚠	Ca	None	Not established	41	OV	Carcinogen Unknown Odor Threshold	
1, 1, 2, 2-Tetrachloroethane	79-34-5	Acetylene tetrachloride, Symmetrical tetrachloroethane	⚠	Ca TWA 1 ppm (7 mg/m ³) [skin]	5 ppm (35 mg/m ³) [skin]	0.21	48	OV	Carcinogen	

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Tetrachloroethylene	127-18-4	Perchloroethylene, Perchloroethylene, Perk, Tetrachloroethylene		Ca Minimize workplace exposure concentrations	100 ppm/ C 200 ppm (for 5 minutes in any 3-hour period), with a maximum peak of 300 ppm	6.17	39.2	OV	Carcinogen	
Tetrachloronaphthalene	1335-88-2	Halowax®, Nibren wax, Seekay wax		2 mg/m³ [skin]	2 mg/m³ [skin]	Not established		OV/HEPA	Unknown Odor Threshold Unknown Filter Effectiveness	Requires both filters. Compound has been identified as possibly existing in both vapor and particulate phase.
Tetraethyl lead (as Pb)	78-00-2	Lead tetraethyl, TEL, Tetraethylplumbane		0.075 mg/m³ [skin]	0.075 mg/m³ [skin]	Not established		OV	Unknown Odor Threshold Unknown Filter Effectiveness	
Tetrahydrofuran	109-99-9	Diethylene oxide; 1,4-Epoxybutane; Tetramethylene oxide; THF		200 ppm (590 mg/m³) ST 250 ppm (735 mg/m³)	TWA 200 ppm (590 mg/m³)	3.6	4.4	OV		
Tetramethyl lead (as Pb)	75-74-1	Lead tetramethyl, Tetramethylplumbane, TML		TWA 0.075 mg/m³ [skin]	TWA 0.075 mg/m³ [skin]	Not established		OV	Unknown Odor Threshold Unknown Filter Effectiveness	
Tetramethyl succinonitrile	3333-52-6	Tetramethyl succinodinitrile, TMSN		3 mg/m³ (0.5 ppm) [skin]	3 mg/m³ (0.5 ppm) [skin]	Not established		OV	Unknown Odor Threshold Unknown Filter Effectiveness	
Tetranitromethane	509-14-8	Tetan, TNM		1 ppm (8 mg/m³)	1 ppm (8 mg/m³)	Not established	45	OV	Unknown Odor Threshold	
Tetrasodium pyrophosphate	7722-88-5	Pyrophosphate, Sodium pyrophosphate, Tetrasodium diphosphate, Tetrasodium pyrophosphate (anhydrous), TSPP		5 mg/m³	None	Not established		HEPA		
Tetryl	479-45-8	N-Methyl-N,2,4,6-tetranitroaniline; Nitramine; 2,4,6-Tetryl; 2,4,6-Trinitrophenyl-N-methylnitramine		1.5 mg/m³ [skin]	1.5 mg/m³ [skin]	Not established		HEPA		Class A explosive.
Thallium (soluble compounds, as TI)		Synonyms vary depending upon the specific soluble thallium compound		0.1 mg/m³ [skin]	0.1 mg/m³ [skin]	Not established		HEPA		
4, 4'-Thiobis(6-tert-butyl-m-cresol)	96-69-5	4,4'-Thiobis(3-methyl-6-tert-butylphenol); 1,1'-Thiobis(2-methyl-4-hydroxy-5-tert-butylbenzene)		10 mg/m³ (total) TWA 5 mg/m³ (resp)	15 mg/m³ (total) TWA 5 mg/m³ (resp)	Not established		AG/HEPA	Unknown Odor Threshold Unknown Filter Effectiveness	Requires both filters.
Thioglycolic acid	68-11-1	Acetyl mercaptan, Mercaptoacetate, Mercaptoacetic acid, 2-Mercaptoacetic acid, 2-Thioglycolic acid, Thiovanic acid		1 ppm (4 mg/m³) [skin]	None	Not established		OV	Unknown Odor Threshold Unknown Filter Effectiveness	
Thionyl chloride	7719-09-7	Sulfinyl chloride, Sulfur chloride oxide, Sulfurous dichloride, Sulfurous oxychloride, Thionyl dichloride		C 1 ppm (5 mg/m³)	None	Not established		AG	Unknown Odor Threshold Unknown Filter Effectiveness	
Thiram	137-26-8	bis(Dimethylthiocarbamoyl) disulfide, Tetramethylthiuram disulfide		5 mg/m³	5 mg/m³	Not established		AG/HEPA	Unknown Odor Threshold Unknown Filter Effectiveness	Requires both filters.

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Tin	7440-31-5	Metallic tin, Tin flake, Tin metal, Tin powder	☑	2 mg/m ³ [*Note: The REL also applies to other inorganic tin compounds (as Sn) except tin oxides.]	2 mg/m ³ [*Note: The REL also applies to other inorganic tin compounds (as Sn) except tin oxides.]	Not established		HEPA		
Tin (organic compounds, as Sn)		Synonyms vary depending upon the specific organic tin compound. [Note: Also see specific listing for Cyhexatin]	⚠	0.1 mg/m ³ [skin] [*Note: The REL applies to all organic tin compounds except Cyhexatin.]	0.1 mg/m ³ [*Note: The PEL applies to all organic tin compounds.]	Not established		OV/HEPA	Unknown Odor Threshold Unknown Filter Effectiveness	Requires both filters. Compound has been identified as possibly existing in both vapor and particulate phase.
Tin(II) oxide (as Sn)	21651-19-4	Stannous oxide, Tin protoxide [Note: Also see specific listing for Tin(IV) oxide (as Sn).]	☑	2 mg/m ³	None	Not established		HEPA		
Tin(IV) oxide (as Sn)	18282-10-5	Stannic dioxide, Stannic oxide, White tin oxide [Note: Also see specific listing for Tin(II) oxide (as Sn).]	☑	2 mg/m ³	None	Not established		HEPA		
Titanium dioxide	13463-67-7	Rutile, Titanium oxide, Titanium peroxide	⚠	Ca	15 mg/m ³	Not established		HEPA	Carcinogen	
o-Tolidine	119-93-7	4,4'-Diamino-3,3'-dimethylbiphenyl; Diaminoditoly; 3,3'-Dimethylbenzidine; 3,3'-Dimethyl-4,4'-diphenyldiamine; 3,3'-Tolidine	⚠	Ca C 0.02 mg/m ³ [60-minute] [skin]	Cancer Risk	Not established		OV/HEPA	Carcinogen Unknown Odor Threshold Unknown Filter Effectiveness	Requires both filters.
Toluene	108-88-3	Methyl benzene, Methyl benzol, Phenyl methane, Toluol	☑	100 ppm (375 mg/m ³) ST 150 ppm (560 mg/m ³)	200 ppm C 300 ppm 500 ppm (10-minute maximum peak)	0.16	20.1	OV		
Toluenediamine	25376-45-8<	Diaminotoluene, Methylphenylene diamine, TDA, Toluenediamine isomers, Tolylenediamine [Note: Various isomers of TDA exist.]	⚠	Ca	None	Not established		HEPA	Carcinogen Exposure Limit Not Established Unknown Filter Effectiveness	
Toluene-2, 4-diisocyanate	584-84-9	TDI; 2,4-TDI; 2,4-Toluene diisocyanate	⚠	Ca	C 0.02 ppm (0.14 mg/m ³)	0.17	42.2	OV/HEPA	Carcinogen Poor Odor Warning	Requires both filters.
m-Toluidine	108-44-1	3-Amino-1-methylbenzene, 1-Aminophenylmethane, m-Aminotoluene, 3-Methylaniline, 3-Methylbenzenamine, 3-Toluidine, m-Tolylamine	⚠	Not established REL's -a limited evaluation of the literature and concluded that the documentation cited by OSHA was inadequate to support the proposed PEL (as an 8-hour TWA) of 10 mg/m ³ for alpha-alumina, benomyl, emery, glycerine (mist), graphite (synth)	None	0.46-5.90	42.4	OV	Exposure Limit Not Established Poor Odor Warning	
o-Toluidine	95-53-4	o-Aminotoluene, 2-Aminotoluene, 1-Methyl-2-aminobenzene, o-Methylaniline, 2-Methylaniline, ortho-Toluidine, o-Tolylamine	⚠	Ca	5 ppm (22 mg/m ³) [skin]	0.025-6.60	43.2	OV	Carcinogen Poor Odor Warning	

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p-Toluidine	106-49-0	4-Aminotoluene, 4-Methylaniline, 4-Methylbenzenamine, 4-Toluidine, p-Tolylamine		Ca	None	0.027-3.2		OV	Carcinogen Poor Odor Warning Unknown Filter Effectiveness	
Tributyl phosphate	126-73-8	Butyl phosphate, TBP, Tributyl ester of phosphoric acid, Tri-n-butyl phosphate		0.2 ppm (2.5 mg/m ³)	5 mg/m ³	Not established		OV/HEPA	Unknown Odor Threshold Unknown Filter Effectiveness	Requires both filters.
Trichloroacetic acid	76-03-9	TCA, Trichloroethanoic acid		1 ppm (7 mg/m ³)	None	0.295		OV/HEPA	Unknown Filter Effectiveness	Requires both filters.
1, 2, 4-Trichlorobenzene	120-82-1	unsym-Trichlorobenzene; 1,2,4-Trichlorobenzol		C 5 ppm (40 mg/m ³)	None	2.91	58.6	OV		
1, 1, 2-Trichloroethane	79-00-5	Ethane trichloride, beta-Trichloroethane, Vinyl trichloride		Ca TWA 10 ppm (45 mg/m ³) [skin]	10 ppm (45 mg/m ³) [skin]	Not established	26.4	OV	Carcinogen Unknown Odor Threshold	
Trichloroethylene	79-01-6	Ethylene trichloride, TCE, Trichloroethene, Trilene		Ca	100 ppm C 200 ppm 300 ppm (5-minute maximum peak in any 2 hours)	1.36	19.9	OV	Carcinogen	
Trichloronaphthalene	1321-65-9	Halowax®, Nibren wax, Seekay wax		5 mg/m ³ [skin]	5 mg/m ³ [skin]	Not established		OV/HEPA	Unknown Odor Threshold Unknown Filter Effectiveness	Requires both filters. Compound has been identified as possibly existing in both vapor and particulate phase.
1, 2, 3-Trichloropropane	96-18-4	Allyl trichloride, Glycerol trichlorohydrin, Glyceryl trichlorohydrin, Trichlorohydrin		Ca TWA 10 ppm (60 mg/m ³)	50 ppm (300 mg/m ³)	100	42.9	OV	Carcinogen Poor Odor Warning	
1, 1, 1, 2-Trichloro-1, 2, 2-trifluoroethane	76-13-1	Chlorofluorocarbon-113, CFC-113, Freon® 113, Genetron® 113, Halocarbon 113, Refrigerant 113, TTE		1000 ppm (7600 mg/m ³) ST 1250 ppm (9500 mg/m ³)	1000 ppm (7600 mg/m ³)	487	28.1	OV		
Triethylamine	121-44-8	TEA		Not established REL's -a limited evaluation of the literature and concluded that the documentation cited by OSHA was inadequate to support the proposed PEL (as an 8-hour TWA) of 10 mg/m ³ for alpha-alumina, benomyl, emery, glycerine (mist), graphite (synth)	25 ppm (100 mg/m ³)	0.001	7	OV	Low Odor Threshold	OV Filter is more effective than AM.
Trifluorobromomethane	75-63-8	Bromotrifluoromethane, Fluorocarbon 1301, Freon® 13B1, Halocarbon 13B1, Halon® 1301, Monobromotrifluoromethane, Refrigerant 13B1, Trifluoromonobromomethane		1000 ppm (6100 mg/m ³)	1000 ppm (6100 mg/m ³)	16.3	0.1	Not recommended	Short Filter Life	

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Trimellitic anhydride	552-30-7	1,2,4-Benzenetricarboxylic anhydride; 4-Carboxyphthalic anhydride; TMA; TMAN; Trimellitic acid anhydride [Note: TMA is also a synonym for Trimethylamine.]		0.005 ppm (0.04 mg/m ³) Should be handled in the workplace as an extremely toxic substance.	None	Not established		OV/HEPA	Unknown Odor Threshold Unknown Filter Effectiveness	Requires both filters. Compound has been identified as possibly existing in both vapor and particulate phase.
Trimethylamine	75-50-3	N,N-Dimethylmethanamine; TMA [Note: May be used in an aqueous solution (typically 25%, 30%, or 40% TMA.)]		10 ppm (24 mg/m ³) ST 15 ppm (36 mg/m ³)	None	0.001	1.5	OV	Low Odor Threshold	OV Filter is more effective than AM filter.
1, 2, 3-Trimethylbenzene	526-73-8	Hemellitil [Note: hemimellitene is a mixture of the 1,2,3-isomer with up to 10% of related aromatics such as the 1,2,4-isomer.]		25 ppm (125 mg/m ³)	None	2.4	35.4	OV		
1, 2, 4-Trimethylbenzene	95-63-6	Asymmetrical trimethylbenzene, psi-Cumene, Pseudocumene [Note: hemimellitene is a mixture of the 1,2,3-isomer with up to 10% of related aromatics such as the 1,2,4-isomer]		25 ppm (125 mg/m ³)	None	2.4	34	OV		
1, 3, 5-Trimethylbenzene	108-67-8	Mesitylene, Symmetrical trimethylbenzene, sym-Trimethylbenzene		25 ppm (125 mg/m ³)	None	2.4	33.4	OV		
Trimethyl phosphite	121-45-9	Methyl phosphite, Trimethoxyphosphine, Trimethyl ester of phosphorous acid		2 ppm (10 mg/m ³)	None	0.001	15.9	OV	Low Odor Threshold	
2, 4, 6-Trinitrotoluene	118-96-7	1-Methyl-2,4,6-trinitrobenzene; TNT; Trinitrotoluene; sym-Trinitrotoluene; Trinitrotoluol		0.5 mg/m ³ [skin]	1.5 mg/m ³ [skin]	Not established		OV/HEPA	Unknown Odor Threshold Unknown Filter Effectiveness	Requires both filters. Compound has been identified as possibly existing in both vapor and particulate phase. Class A explosive.
Triorthocresyl phosphate	78-30-8	TCP, TOCP, Tri-o-cresyl ester of phosphoric acid, Tri-o-cresyl phosphate		0.1 mg/m ³ [skin]	0.1 mg/m ³			HEPA		
Triphenylamine	603-34-9	N,N-Diphenylaniline; N,N-Diphenylbenzenamine		5 mg/m ³	None	Not established		HEPA		
Triphenyl phosphate	115-86-6	Phenyl phosphate, TPP, Triphenyl ester of phosphoric acid		3 mg/m ³	3 mg/m ³	Not established		HEPA		OV/HEPA preferable when heat is involved.
Tungsten	7440-33-7	Tungsten metal, Wolfram		5 mg/m ³ ST 10 mg/m ³ [*Note: The REL also applies to other insoluble tungsten compounds (as W).]	None	Not established		HEPA		

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Tungsten carbide (cemented)	1: 11107-01-0 2: 12718-69-3 3: 37329-49-0	Cemented tungsten carbide, Cemented WC, Hard metal [Note: The tungsten carbide (WC) content is generally 85-95% & the cobalt content is generally 5-15%.] [1: 85% WC, 15% Co 2: 92% WC, 8% Co 3: 78% WC, 14% Co, 8% Ti]	<input checked="" type="checkbox"/>	When the cobalt (Co) content exceeds 2%, its contribution to the potential hazard is judged to exceed that of tungsten carbide. Therefore, the NIOSH REL (10-hour TWA) for cemented tungsten carbide containing >2% Co is 0.05 mg Co/m ³ ; the applicable OSHA PEL is 0.1 mg Co/m ³ (8-hour TWA). Nickel (Ni) may sometimes be used as a binder rather than cobalt. NIOSH considers cemented tungsten carbide containing nickel to be a Potential occupational Carcinogen and recommends a REL of 0.015 mg Ni/m ³ (10-hour TWA). The OSHA PEL for Insoluble Nickel (i.e., a 1 mg Ni/m ³ 8-hour TWA) applies to mixtures of tungsten carbide and nickel	Not established		HEPA			
Tungsten (soluble compounds, as W)		Synonyms vary depending upon the specific soluble tungsten compound.	<input checked="" type="checkbox"/>	1 mg/m ³ ST 3 mg/m ³	None	Not established		HEPA		
Turpentine	8006-64-2	Gumspirits, Gum turpentine, Spirits of turpentine, Steam distilled turpentine, Sulfate wood turpentine, Turps, Wood turpentine		100 ppm (560 mg/m ³)	100 ppm (560 mg/m ³)	100-200	10	OV/HEPA	Poor Odor Warning	Requires both filters. Compound has been identified as possibly existing in both vapor and particulate phase.
1-Undecanethiol	5332-52-5	Undecyl mercaptan		C 0.5 ppm (3.9 mg/m ³) [15-minute]	None	Not established		OV	Unknown Odor Threshold Unknown Filter Effectiveness	
Uranium (insoluble compounds, as U)	7440-61-1	Uranium metal; Uranium I Synonyms of other insoluble uranium compounds vary depending upon the specific compound		Ca TWA 0.2 mg/m ³ ST 0.6 mg/m ³	0.25 mg/m ³	Not established		Not recommended	Carcinogen	
Uranium (soluble compounds, as U)		Synonyms vary depending upon the specific soluble uranium compound		Ca TWA 0.05 mg/m ³	0.05 mg/m ³	Not established		Not recommended	Carcinogen	
n-Valeraldehyde	110-62-3	Amyl aldehyde, Pentanal, Valeral, Valeraldehyde, Valeric aldehyde		50 ppm (175 mg/m ³) See Appendix C (Aldehydes) of the NIOSH guide for more information	None	0.006	13.7	OV	Low Odor Threshold	

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Vanadium dust	1314-62-1	Divanadium pentoxide dust, Vanadic anhydride dust, Vanadium oxide dust, Vanadium pentaoxide dust	☑	C 0.05 mg V/m ³ [15-minute] [*Note: The REL applies to all vanadium compounds except Vanadium metal and Vanadium carbide (see Ferrovandium dust).]	C 0.5 mg V2O5/m ³ (resp)	Not established		HEPA		
Vanadium fume	1314-62-1	Divanadium pentoxide fume, Vanadic anhydride fume, Vanadium oxide fume, Vanadium pentaoxide fume	☑	C 0.05 mg V/m ³ [15-minute]	C 0.1 mg V2O5/m ³	Not established		HEPA		
Vegetable oil mist	68956-68-3	Vegetable mist	☑	10 mg/m ³ (total) TWA 5 mg/m ³ (resp)	15 mg/m ³ (total) TWA 5 mg/m ³ (resp)	Not established		HEPA		
Vinyl acetate	108-05-4	1-Acetoxyethylene, Ethenyl acetate, Ethenyl ethanoate, VAC, Vinyl acetate monomer, Vinyl ethanoate	☑	C 4 ppm (15 mg/m ³) [15-minute]	None	0.603	8.6	OV		
Vinyl bromide	593-60-2	Bromoethene, Bromoethylene, Monobromoethylene	⊘	Ca	None	3,000		Not recommended	Carcinogen Unknown Filter Effectiveness Unknown Odor Threshold Exposure Limit Not Established	
Vinyl chloride	75-01-4	Chloroethene, Chloroethylene, Ethylene monochloride, Monochloroethene, Monochloroethylene, VC, Vinyl chloride monomer (VCM)	⊘	Ca	1 ppm C 5 ppm [15-minute]	0.253	0.4	Not recommended	Carcinogen Short Filter Life	
Vinyl cyclohexene dioxide	106-87-6	1-Epoxyethyl-3,4-epoxy-cyclohexane; 4-Vinylcyclohexene diepoxide; 4-Vinyl-1-cyclohexene dioxide	⚠	Ca TWA 10 ppm (60 mg/m ³) [skin]	None	Not established		OV	Carcinogen Unknown Odor Threshold Unknown Filter Effectiveness	
Vinyl fluoride	75-02-5	Fluoroethene, Fluoroethylene, Monofluoroethylene, Vinyl fluoride monomer	⊘	1 ppm C 5 ppm [use 1910.1017]	None	Not established		Not recommended	Unknown Odor Threshold Unknown Filter Effectiveness	
Vinylidene chloride	75-35-4	1,1-DCE; 1,1-Dichloroethene; 1,1-Dichloroethylene; VDC; Vinylidene chloride monomer; Vinylidene dichloride	⚠	Ca	None	35.5	6.4	OV	Carcinogen Poor Odor Warning Exposure Limit Not Established	
Vinylidene fluoride	75-38-7	Difluoro-1,1-ethylene; 1,1-Difluoroethene; 1,1-Difluoroethylene; Halocarbon 1132A; VDF; Vinylidene difluoride	⊘	1 ppm C 5 ppm [use 1910.1017]	None	Not established		Not recommended	Unknown Odor Threshold Unknown Filter Effectiveness	
Vinyl toluene	25013-15-4	Ethenylmethylbenzene, Methylstyrene, Tolyethylene	☑	100 ppm (480 mg/m ³)	100 ppm (480 mg/m ³)	10	35.8	OV		
VM & P Naphtha	8032-32-4	Ligroin, Painters naphtha, Petroleum ether, Petroleum spirit, Refined solvent naphtha, Varnish makers' & painters' naphtha	⚠	350 mg/m ³ C 1800 mg/m ³ [15-minute]	None	Jan-40		OV	Unknown Filter Effectiveness	

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Warfarin	81-81-2	3-(alpha-Acetyl)-benzyl-4-hydroxycoumarin, 4-Hydroxy-3-(3-oxo-1-phenyl butyl)-2H-1-benzopyran-2-one, WARF	☑	0.1 mg/m ³	0.1 mg/m ³	Not established		HEPA		
Welding fumes		Synonyms vary depending upon the specific component of the welding fumes	⚠	Ca	None	Not established		OV/HEPA	Carcinogen Unknown Odor Threshold Unknown Filter Effectiveness Exposure Limit Not Established	Requires both filters.
Wood dust		Hard wood dust, Soft wood dust, Western red cedar dust	⚠	Ca 1 mg/m ³	15 mg/m ³ (total) TWA 5 mg/m ³ (resp)	Not established		HEPA	Carcinogen	
m-Xylene	108-38-3	1,3-Dimethylbenzene; meta-Xylene; m-Xylol	☑	100 ppm (435 mg/m ³) ST 150 ppm (655 mg/m ³)	100 ppm (435 mg/m ³)	0.324	27.6	OV		
o-Xylene	95-47-6	1,2-Dimethylbenzene; ortho-Xylene; o-Xylol	☑	100 ppm (435 mg/m ³) ST 150 ppm (655 mg/m ³)	100 ppm (435 mg/m ³)	0.851	28.7	OV		
p-Xylene	106-42-3	1,4-Dimethylbenzene; para-Xylene; p-Xylol	☑	100 ppm (435 mg/m ³) ST 150 ppm (655 mg/m ³)	100 ppm (435 mg/m ³)	0.49	27.4	OV		
m-Xylene-alpha, alpha'-diamine	1477-55-0	1,3-bis(Aminomethyl)benzene; 1,3-Benzenedimethanamine; MXDA; m-Phenylenbis(methylamine); m-Xylylenediamine	⚠	C 0.1 mg/m ³ [skin]	None	Not established		OV/HEPA	Unknown Odor Threshold Unknown Filter Effectiveness	Requires both filters. Compound has been identified as possibly existing in both vapor and particulate phase.
Xylidine	1300-73-8	Aminodimethylbenzene, Aminoxylene, Dimethylaminobenzene, Dimethylaniline, Xylidine isomers (e.g., 2,4-Dimethylaniline) [Note: Dimethylaniline is also used as a synonym for N,N-Dimethylaniline]	⚠	2 ppm (10 mg/m ³) [skin]	5 ppm (25 mg/m ³) [skin]	0.005-0.06	40.2	OV/HEPA	Low Odor Threshold	Requires both filters.
Yttrium	7440-65-5	Yttrium metal	☑	1 mg/m ³ [*Note: The REL also applies to other yttrium compounds (as Y).]	1 mg/m ³ [*Note: The REL also applies to other yttrium compounds (as Y).]	Not established		HEPA		
Zinc chloride fume	7646-85-7	Zinc dichloride fume	☑	1 mg/m ³ ST 2 mg/m ³	1 mg/m ³	Not established		HEPA		
Zinc oxide	1314-13-2	Zinc peroxide	☑	Dust: TWA 5 mg/m ³ C 15 mg/m ³ Fume: TWA 5 mg/m ³ ST 10 mg/m ³	5 mg/m ³ (fume) TWA 15 mg/m ³ (total dust) TWA	Not established		HEPA		
Zinc stearate	557-05-1	Dibasic zinc stearate, Zinc salt of stearic acid, Zinc distearate	☑	10 mg/m ³ (total) TWA 5 mg/m ³ (resp)	15 mg/m ³ (total) TWA 5 mg/m ³ (resp)	Not established		HEPA		
Zirconium compounds (as Zr)	7440-67-7	Zirconium metal: Zirconium	☑	5 mg/m ³ ST 10 mg/m ³ [*Note: The REL applies to all zirconium compounds (as Zr) except Zirconium tetrachloride.]	5 mg/m ³	Not established		HEPA		

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