

# MOLDEX®

Ideas that wear well.®



## 2012 CHEMICAL SELECTION GUIDE

### WARNING

The information in the *2012 Moldex Chemical Selection Guide* is dated and was accurate to the best of Moldex's knowledge as of January 2012. This *2012 Guide* supercedes all previous *Guides*, including printed and electronic versions. If you have an electronic version other than the *2012 Guide* please delete it from your computer. The *2012 Guide* can be accessed online at <http://www.moldex.com/pdf/datasheets/chemicalselectionguide.pdf>

Before selecting Moldex respirators for use, it is important that you refer to the most recent *Guide* available. If you have any questions on how to use this guide or on the selection and use of any respiratory protection device, call the Moldex Technical Services Department at +1 (800) 421-0668, +1 (310) 837-6500, ext. 512/550 or [tech@moldex.com](mailto:tech@moldex.com).

Products listed in this *Guide* are subject to the Moldex limited warranty located on the back cover.



## INTRODUCTION

This *Guide* may be used as an aid to select appropriate respiratory protection for specific contaminants. Because conditions at the worksite can vary substantially, a comprehensive evaluation must be made to determine the correct respiratory protection. When contaminants at a worksite have been identified and concentrations measured, this *Guide* may be used to help select the appropriate respirator. Only qualified professionals, familiar with the actual working conditions and knowledgeable in the benefits and the limitations of respiratory protection equipment, should make the selection. Once a respirator has been selected, it is important to continually monitor its effectiveness, as well as the dynamic worksite situation. If selection criteria changes, including but not limited to worksite conditions or standards and regulations, a new evaluation must be made to determine the appropriate respiratory protection.

## COMPREHENSIVE RESPIRATORY PROTECTION PROGRAM

Wherever respirators are used in a work environment, a comprehensive respiratory protection program must be implemented in accordance with OSHA 29 CFR 1910.134, as a minimum. This regulation covers permissible practice, written programs, training, maintenance and care, selection, use, fit testing, cleaning and storage, medical evaluation, breathing air quality, identification of filters and cartridges, program evaluation, and record keeping. When a chemical cartridge respirator is used, it can only be used if a cartridge change schedule is developed in accordance with 29 CFR 1910.134 (d)(3)(III)(B)(2). If a change schedule is not developed you should not use Moldex respirators. See pages 28-30 for more information.

## RESPIRATOR FIT TESTS

Any respirator used by an employee must be fit tested to ensure that the respirator is providing adequate protection to the wearer. All Moldex respirator users should be fit tested to ensure proper fit of the respirator. OSHA 1910.134 describes the various types of fit tests that may be utilized.

## ASSIGNED PROTECTION FACTORS (APF)

All Moldex respirators listed in this *Guide* are half mask or full face, negative pressure, air purifying respirators. Generally, these are assigned an APF of 10 or 50 respectively, unless a specific OSHA, Federal, State or Local standard assigns a lower APF for a particular class of respirator to be used to protect against a particular substance. In such cases the lower APF must be used. A full facepiece respirator fitted using a qualitative fit test only receives an APF of 10.

## OTHER PERSONAL PROTECTIVE EQUIPMENT (PPE)

Certain chemicals may require other forms of PPE in addition to respirators due to absorption or damage to the skin, eyes or mucous membranes. When supplying respiratory protective equipment, other PPE must also be considered. Failure to provide appropriate protection with certain chemicals may result in adverse health effects and render the use of a respirator ineffective. Lastly, always consider all the hazards that an employee may be exposed to and the advantages and disadvantages of using a particular piece of equipment in concert with other items (e.g. hard hats, gloves, faceshields, etc.).

**When using any Moldex respirator, read all applicable warnings and information provided with it. Not all Moldex respirators have not been sold with warnings or use instructions for personnel involved in health-care or related situations, where there may be the possibility of contact with disease or biological hazards. If you are considering such uses, first call the Moldex Technical Dept., +1 (310) 837-6500 ext. 512/550 or +1 (800) 421-0668 ext. 512/550. See additional warnings in packaging or Moldex Website or page 4 of this guide.**

## EXPLANATION OF GUIDE FORMAT

**Chemical Names** listed are either those used by OSHA in 29 CFR 1910.1000, NIOSH's Pocket Guide to Chemical Hazards or ACGIH's 2011 Guide to Occupational Exposure Values. Only substances that have OSHA Permissible Exposure Limits (PEL) and/or American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values (TLV) are listed in this *Guide*.

**CAS Numbers** are below the name of most chemicals and are the Chemical Abstracts Service (CAS) registry number. This number is unique for each chemical.

**Synonyms** listed are some of those common "other" names of a substance found in various references, [this list is not all inclusive](#).

**Filter Type** generally indicates what type of filter and/or cartridge should be used for protection from a particular substance. Remember these suggestions are not absolute. Selection must be based on consideration of the work and use situation encountered in a particular environment.

"N" means Dusts and Non-Oil Based Mists

"R" means Dusts, and Oil and Non-Oil Based Mists with time restrictions  
"P" means Dusts and Oil and Non-Oil Based Mists, extended life for Dusts and Non-Oil Based Mists

"AM" means Ammonia/Methylamine

"AG" means Acid Gas

"FORM" means Formaldehyde

"OV" means Organic Vapor

"OV/AG" means Organic Vapor/Acid Gas

"MULTI" means Multi Gas/Vapor

"95" means 95% efficient

"99" means 99% efficient

"100" means 99.97% efficient

"/" means OR. For example, 8970/8940 means you may use either filter.

"FF" means full face respirator; 9000 is suggested.

Note that combinations of the above may be listed. Also note that combination Moldex cartridges (7300/8300) may be used where an OV or AG is listed, but the service life of the cartridge will be considerably less for the particular substance. A similar situation of reduced service life exists with the 7600/8600 multi-gas cartridges used against various contaminants, see instructions for specific information.

**Moldex Suggestions** are the Moldex respirators that are appropriate for protection from the substance listed. Remember, anywhere the 2200N95 (EZ 22) or 2300N95 (EZ 23) are suggested the 2400N95 (2800N95) or 2500N95 (2940R95) may also be used. **The 2400N95 or 2800N95 is usually suggested where protection from dusts or non-oil based mists is required and nuisance level (below the PEL) organic vapor odors are also present. The 2500N95 is usually suggested where protection from dusts or non-oil based mist is required and nuisance level (below the PEL) acid gas irritants are also present and 2940R95 for dusts and both oil and non-oil based mist.**

Additionally, any situation where a particular Moldex product is suggested you may move to a higher level of protection provided the type of protection is equivalent. For example,

- you may use the 2310N99 in place of the 2200N95 if dust or non-oil based mist protection is required;
- you may use the 7940/8940 in place of the 2310N99 if protection from a dust, fume or mist is required;
- you may use any N99 respirator/filter in place of any N95 respirator/filter.
- you may go from a half mask facepiece respirator to a full facepiece respirator with equivalent or higher filters/cartridges.

## BUT

- you may not go from 2200N95 to 7100/8100 to protect against a fume because 7100/8100 is used to protect against organic vapors only;

## AND

- you may not go from a 7940P100/8940P100 to a 2300N95 to protect against things such as lead because lead requires an N, R, or P100 filter, or from a 2730N100 to a 2400N95 because the efficiency level is lower.
- you may not go down from a full facepiece to a half mask without proper evaluation of the workplace.
- Note: Where oil based aerosols are present only an R or P Series filter may be used. Moldex suggests that you assume that any non-aqueous liquid is oil-based.

TLV's and PEL's are listed where either one or both exist. We suggest that in cases where both a TLV and PEL exist for a particular substance, that the lower of the two be used.

An "o" next to exposure limit indicates it is an OSHA PEL. A "t" indicates it is an ACGIH TLV.

Exposure limit concentrations may be listed as either ppm (parts per million), or mg/m<sup>3</sup> (milligrams per cubic meter), mppcf (million particles per cubic foot) or f/cc (fibers per cubic centimeter of air).

All exposure limits refer to 8 hours per day, 40 hours per week Time Weighted Averages (TWA), unless otherwise stated.

If a "c" appears next to a limit this indicates that it is a ceiling value which refers to the concentration that should not be exceeded at any time during work exposure.

If an "s" appears next to a limit this indicates that it is a short term exposure limit (STEL), which refers to a 15 minute TWA (unless otherwise indicated), which shall not be exceeded during a workday.

Both "s" and/or "c" designations may be in addition to or in lieu of another exposure limit.

A "skin" designation indicates that the substance can be absorbed through the skin, eyes or mucous membranes and appropriate measures must be taken to avoid absorption.

A "SEN" indicates TLV-confirmed potential for worker sensitization as a result of dermal contact and/or inhalation exposure based on the weight of scientific evidence.

For more specific definitions refer to 29 CFR 1910.1000 and to the ACGIH TLV Booklet.

**IDLH (Immediately Dangerous to Life and Health) and LEL (Lower Explosion Limit) are levels taken directly from the 2005 NIOSH Pocket Guide to Chemical Hazards. In cases where the LEL is listed it is considered as IDLH. In all cases the LEL is listed as 10% LEL to provide a safety factor against explosion.**

**N.D. means not determined.**

**Comments** list any additional points that should be noted such as:

- If a substance is a carcinogen or a suspected carcinogen, it is listed here. Note that only when OSHA or ACGIH consider a substance a carcinogen or suspected carcinogen it is listed. Carcinogen or suspected carcinogen from any other organizations or agencies have not been included in this *Guide*.

*ACGIH designates carcinogens as follows:*

TLV-A1: Confirmed Human Carcinogen. The agent is carcinogenic to (t-A1) humans based upon the weight of evidence from epidemiologic studies.

TLV-A2: Suspected Human Carcinogen. Human data are accepted as (t-A2) adequate in quality but are conflicting or insufficient to classify the agent as a confirmed human carcinogen; OR, the agent is carcinogenic in experimental animals at dose(s), by route(s) of exposure, at site(s), of histologic type(s), or by mechanism(s) considered relevant to worker exposure. The A2 is used primarily when there is limited evidence of carcinogenicity in humans and sufficient evidence of carcinogenicity in experimental animals with relevance to humans.

TLV-A3: Confirmed Animal Carcinogen with Unknown Relevance to Humans: (t-A3) The agent is carcinogenic in experimental animals at a relatively high dose, by route(s) of administration, at site(s), of histologic type(s), or by mechanism(s) that may not be relevant to worker exposure. Available epidemiologic studies do not confirm an increased risk of cancer in exposed humans. Available evidence does not suggest that the agent is likely to cause cancer in humans except under uncommon or unlikely routes or levels of exposure.

TLV-A4: Not Classifiable as a Human Carcinogen: Agents which cause (t-A4) concern that they could be carcinogenic for humans, but which can not be assessed conclusively because of a lack of data. *In vitro* or animal studies do not provide indications or carcinogenicity which are sufficient to classify the agent into one of the other categories.

TLV-A5: Not Suspected as a Human Carcinogen: The agent is not suspected (t-A5) to be a human carcinogen on the basis of properly conducted epidemiologic studies in humans. These studies have sufficiently long follow-up, reliable exposure histories, sufficiently high dose, and adequate statistical power to conclude that exposure to the agent does not convey a significant risk of cancer to humans; OR, the evidence suggesting a lack of carcinogenicity in experimental animals is supported by mechanistic data.

Substances for which no human or experimental animal carcinogenic data have been reported are assigned no carcinogen designation.

Exposures to carcinogens must be kept to a minimum. Workers exposed to A1 carcinogens without a TLV should be properly equipped to eliminate to the fullest extent possible all exposure to the carcinogen. For A1 carcinogens with a TLV and for A2 and A3 carcinogens, worker exposed by all routes should be carefully controlled to levels as low as reasonably achievable below the TLV.

OSHA designates carcinogens as follows:

CA: Carcinogen defined with no further categorization.

Additionally,

- If specific OSHA standards exist for a substance, it is listed in this section.
- If OSHA is in the process of changing the regulation of a particular substance, it is listed as "OSHA in the process of 6b rulemaking."
- If ACGIH intends to change a TLV or a carcinogen designation, it is listed as "ACGIH NIC (Notice of Intended Change)."
- If ACGIH has a Biological Exposure Indices (BEI), it is listed as "Substance for which an ACGIH BEI exists."
- If ACGIH intends to change a short term exposure limit or ceiling value, it is listed as ACGIH NIC STEL/CEIL.

Pages 31-33 contains names of chemicals that Moldex does not recommend its respirators to be used against. Refer to this list when you are not able to locate a chemical in the *Guide* as it may be listed there. Moldex does not make recommendations for chemicals not listed in the *Guide*.

## REFERENCES:

AIR CONTAMINANTS – PERMISSIBLE EXPOSURE LIMITS TITLE 29 CFR 1910.1000 U.S. Department of Labor, Occupational Safety and Health Administration, 1989

POCKET GUIDE TO CHEMICAL HAZARDS U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, National Institute for Occupational Safety and Health, 2005

2011 GUIDE TO OCCUPATIONAL EXPOSURE VALUES American Conference of Governmental Industrial Hygienists, 2011

Richard J. Lewis, Sr., HAZARDOUS CHEMICALS DESK REFERENCE, 2nd Edition New York, Van Nostrand Reinhold

## Example on how to use the Moldex 2010 Chemical Selection Guide

Chemical Name	Common other Names	Suggested Respirator(s) for Iron Oxide, Dust & Fume.	*ACGIH Threshold Limit Value (TLV).	Other notes user must be made aware of. See above for explanations.
<b>Iron Oxide, Dust &amp; Fume (as Fe)</b> 1309-37-1	Ferric Oxide Fume	N	5 mg/m <sup>3</sup> (t)*, 10 mg/m <sup>3</sup> (o) <b>{water soluble}</b>	t-A4, *Particulate containing no Asbestos and < 1% Crystalline Silica.
CAS Number		Type of Filter or Cartridge that is suggested for Iron Oxide, Dust & Fume.	*OSHA Permissible Exposure Limit (PEL). *For this example use ACGIH TLV. When both the PEL & TLV are listed, it is suggested to use the lower of the two.	Concentration when Iron Oxide, Dust & Fume becomes immediately dangerous to life and health (IDLH).

## SUPPLEMENTAL HAZARD WARNINGS FOR MOLDEX PARTICULATE RESPIRATORS

These are **Warnings and Limitations** that all users must be made aware of in addition to all warnings and other information on the outside of the Moldex respirator packaging or other published related information. **You must read and comply with these Warnings and Limitations at all times** and if your employer has determined that it is appropriate to use this respirator.

**Proper use of this respirator may reduce but will not eliminate the risk of illness or death from exposure to some Chemical, Biological, Radiological, or Nuclear (CBRN) hazards.** CBRN hazards include, but are not limited to, bacteria, toxins, and viruses that can cause death, serious bodily injury or disfigurement. The long-range and short-range risks of CBRN hazards and the amount and manner of exposure that may produce such risks remain to a great extent unknown. Use of this respirator must be in accordance with the Centers for Disease Control (CDC) Health Advisories or any other Local, State or Federal recommendations for use of respirators against specific CBRN hazards. This respirator should not be used for many CBRN hazards.

**There are more efficient models of respirators with a higher level of protection available from Moldex and other manufacturers. It is up to the employer, and not Moldex, to determine if a respirator should be worn and if so, which type, size, level of protection, and model.**

### **BACKGROUND**

The National Institute for Occupational Safety and Health (NIOSH), a branch of the CDC and a U.S. Government agency, is responsible for testing and certifying respirators for protection against hazardous industrial contaminants. Procedures for selecting and using proper respiratory protection are regulated by various governmental agencies, such as the Occupational Safety and Health Administration (OSHA).

NIOSH tests and certifies certain respirators for use against chemical warfare agents, biological warfare agents or biohazards and provides advisory information for some biohazards, but OSHA and other government agencies have not set any exposure standards for these agents or biohazards, in general.

**Moldex does not make recommendations for any type of respirator to be used against CBRN hazards for workers or the general public.**

You should know that there may be no obvious warnings of the presence or release of CBRN hazards.

### **WARNINGS FOR ALL USERS**

- **This respirator must only be used for substances having Permissible Exposure Limits (PELs) and only where deemed appropriate by your employer.**
- **This respirator must be fit tested. If you cannot obtain a proper fit, do not use the respirator and do not enter the risk area.**
- **This respirator is not for use with beards or other facial hair that prevents direct contact between the face and sealing surface of the respirator.**
- **Moldex respirators, when properly fitted and used as part of a comprehensive respiratory protection program, may reduce wearer exposure to some airborne hazards, but not all.**
- **In the event of a sudden or unexpected CBRN hazard release, you may use this respirator for escape only if you have not been provided with a more appropriate respirator for this type of situation. Do not remove the mask from the face until you have left the contaminated area.**
- **Do not reuse or store for reuse or hang around neck unless your employer specifically authorizes reuse. Dispose of respirator as a hazardous waste in accordance with your employer's directions.**
- **Use other personal protective equipment, as directed by your employer. Where appropriate use protective gloves when handling or removing respirator and dispose of respirator and then gloves in accordance with your employer's directions.**
- **If CDC or other Local, State or Federal agency issues new or revised guidelines for respirator use against specific hazards, users must strictly comply.**

### **WARNINGS FOR USE OF PARTICULATE RESPIRATORS AGAINST TB**

OSHA and CDC have recommended the use of any of the particulate respirators approved under 42CFR84 as a means of providing help in complying with a program designed to reduce occupational exposure to tuberculosis.

The level of effectiveness of respiratory protection from tuberculosis cannot be determined with currently available data. However, proper use of appropriate Moldex respirators in conjunction with a comprehensive respiratory protection program may reduce, but will not eliminate, risk of infection.

- **Be sure to read the Limitations outlined below and strictly follow all Warnings set forth under the WARNINGS FOR ALL USERS.**
- **When using any Moldex respirator, filter replacement and/or disposal must be handled in accordance with your Healthcare Facility's comprehensive respiratory protection program.**
- **If disinfectants are used to sanitize reusable facepieces, you must consult with your Healthcare Facility and run tests to ensure the compatibility of any disinfectant with Moldex reusable facepiece materials. Use of disinfectants could impair the efficiency of the respirator and result in a loss of protection.**

### **LIMITATIONS**

- **Respirators may reduce but do not eliminate wearer exposure to airborne hazards or the risk of contracting any disease or infection.** Only use this respirator as part of a comprehensive respiratory protection program. You will receive no respiratory protection if this respirator is not properly fitted and worn. Additionally, potentially hazardous particles, including infectious agents, smaller than the particle sizes used in NIOSH certifications are likely to exist in certain environments. Some published data indicates that these smaller particles may not be filtered out as effectively as the particle sizes used by NIOSH [N Series Count Median Diameter (CMD)  $0.075 \pm .02\mu\text{m}$  Geometric Standard Deviation 1.86 (GSD) and R & P Series CMD  $0.185 \pm .02\mu\text{m}$  1.6 (GSD)] when certifying respirators. It is imperative that you determine the size and potential hazards of the particles that may be present in the environment before selecting appropriate respiratory protection, and that you refer to CDC guidelines when selecting and using any respirator, particularly in environments where smaller types of particles, such as those referenced above, may be present.
- **If the respirator comes in contact with blood or fluids, including body fluids, leave contaminated area as soon as possible and discard and replace the respirator.**
- **Moldex respirators must not be used on children.**

For further information on use of respirators contact Moldex at +1 (800) 421-0668 or +1 (310) 837-6500 ext. 554, your Employer, or CDC at [www.cdc.gov](http://www.cdc.gov) or +1 (800) 311-3435 or +1 (404) 498-1515.

Chemical – CAS#	Synonyms	Filter Type	Moldex Suggested	TLV(t) PEL(o)	IDLH	Comments
<b>-A-</b>						
<b>Acetaldehyde</b> 75-07-0	Acetic aldehyde, Ethanal, Ethyl aldehyde	FF-OV FF-Form	9001/2/3+ 7100/7500	200 ppm (o) 25 ppm (c)-(t)	2000 ppm	t-A3 Short service life for OV
<b>Acetic Acid</b> 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]	FF-OV	9001/2/3+ 7100	10 ppm (o)(t)	50 ppm	
<b>Acetic Anhydride</b> 108-24-7	Acetic acid anhydride, Acetic oxide, Acetyl oxide, Ethanoic anhydride	FF-OV	9001/2/3+ 7100	5 ppm (o) 1 ppm (t)	200 ppm	t-A4
<b>Acetone</b> 67-64-1	2-Propane, Dimethyl Ketone, Ketone Propane	OV	7100 8100	500 ppm (t) 1,000 (o) 750 (s)-(t)	2,500 ppm [10% Lower explosion limit]	Substance for which ACGIH BEI exists; ACGIH NIC to 200 ppm (t) & 500 (c)-(t); t-A4
<b>Acetylenedichloride</b>	See 1,2-Dichloroethylene					
<b>Acetylene tetrabromide</b> 79-27-6	See 1,1,2,2-Tetrabromoethane					
<b>Acetylsalicylic Acid</b> 50-78-2	Aspirin	N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	5mg/m <sup>3</sup> (t)		
<b>Acrylamide</b> 79-06-1	Propenamide; Acrylaldehyde Monomer; Acrylic Amide	OV/P100	7100+7940 8100+8940	.03mg/m <sup>3</sup> (t)*; .3mg/m <sup>3</sup> (o) -skin-	60mg/m <sup>3</sup>	t-A3; -*Measured as inhalable fraction and vapor
<b>Acrylic Acid</b> 108-24-7	Acroleic acid, Aqueous acrylic acid (technical grade is 94%), Ethylencarboxylic acid, Glacial acrylic acid (98% in aqueous solution), 2-Propenoic acid	FF-OV	9001/2/3+ 7100	ppm,(t) -skin-	N.D.	t-A4
<b>Acrylonitrile</b> 107-13-1	Propenitrile; AN; Vinyl Cyanide	OV; Change every shift	7100 8100	2 ppm (o)(t)*; 10 ppm (c)-(o) -skin-	85 ppm	Dispose of cartridge after shift; See 29CFR1910.1045; O-Ca; t-A3
<b>Allyl Alcohol</b> 79-10-7	AA, Allylic alcohol, Propenol, 1-Propen-3-ol, 2-Propenol, Vinyl carbinol	FF-OV	9001/2/3+ 7100	2 ppm (o) 0.5 ppm (t) -skin-	20 ppm	t-A4
<b>Allyl chloride</b> 107-5-1	3-Chloropropene 1-Chloro 2-Propene 3-Chloropropylene	OV	7100 8100	1 ppm (o)(t)	250 ppm	t-A3
<b>a-Alumina</b> 1344-28-1	Activated Aluminum Oxide	N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	Total dust 10mg/m <sup>3</sup> (t), 15 mg/m <sup>3</sup> (o); Respirable fraction 5mg/m <sup>3</sup> (o)		Dust containing no asbestos and <1% Crystalline Silica t-A4
<b>Aluminum, Metal Dust</b> 7429-90-5		N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	Total dusts 15mg/m <sup>3</sup> (o); Respirable dusts 5mg/m <sup>3</sup> (o) 1mg/m <sup>3</sup> (t) respirable fraction		T-A4
<b>Aluminum Oxide</b>	(See a-Alumina)					
<b>Ammonia</b> 7664-41-7	Anhydrous Ammonia	AM	7400/8400 7600/8600	35 ppm (s)-(t); 25 ppm (t) 50 ppm (o)	300 ppm	Must wear chemical goggles when using half mask respirator
<b>Ammonium Chloride</b> 12125-02-9		solids N  liquids AM/N	EZ22/EZ23N95 2200/2300N95 2600/2700N95 {water based} 8400+8910	10mg/m <sup>3</sup> (t); 20mg/m <sup>3</sup> (s)-(t)		
<b>Ammonium Sulfamate</b> 7773-06-0	Amate Herbicide; Ammonium Amino Sulfonate; AmSi; Sulfamate	N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	Total Dust 10mg/m <sup>3</sup> (t), 15mg/m <sup>3</sup> (o); Respirable fraction 5mg/m <sup>3</sup> (o)	1,500mg/m	

Chemical – CAS#	Synonyms	Filter Type	Moldex Suggested	TLV(t) PEL(o)	IDLH	Comments
<b>n-Amyl Acetate</b> 628-63-7	1-Pentanol Acetate	OV	7100 8100	50 ppm (t) 100 ppm (o) 100 ppm (s)-(t)	1,000 ppm	Add 8940 if Particulate is present
<b>sec-Amyl Acetate</b> 626-38-0	2-Pentanol Acetate	OV	7100 8100	50 ppm (t) 125 ppm (o) 100 ppm (s)-(t)	1,000 ppm	Add 8940 if Particulate is present
<b>Aniline</b> 62-53-3	Aminobenzene, Phenylemine, Aniline Oil	OV	7100 8100	5 ppm (o) 2 ppm (t) -skin-	100 ppm	t-A3
<b>Anisidine (o-,p-Isomers)</b> ° 90-04-0 p 104-94-9	o-Methoxyaniline (oil)*, p-Methoxyaniline (solid)* <sup>‡</sup>	OV/RP OV/N	7100+7940* 7100+8970* 7100+8910* <sup>‡</sup> 8100+8970/8940* 8100+8910* <sup>‡</sup>	0.5mg/m <sup>3</sup> (o)(t); -skin-.	50mg/m <sup>3</sup>	t-A3 for o Isomer t-A4 for p Isomer
<b>Antimony* &amp; Compounds (as Sb), Dusts &amp; Mists</b> *7440-36-0		N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	0.5mg/m <sup>3</sup> (o)(t) {water based mists}	50mg/m <sup>3</sup> (as Sb)	
<b>Antimony, Metal Fume (as Sb)</b> 7440-36-0		N	2310/2315N99	0.5mg/m <sup>3</sup> (o)(t)	50mg/m <sup>3</sup> (as Sb)	
<b>ANTU</b> 86-88-4	a-Naphthylthiocarbamide; 1-Naphthylthiourea	OV/NRP100	7100+7940 8100+8940	0.3mg/m <sup>3</sup> (o)(t)	100mg/m <sup>3</sup>	t-A4
<b>Arsenic, Elemental &amp; Inorganic Compounds (except Arsine) (as As)</b> *7440-38-2		NRP100	2730N100 2360P100 8940/8990 7940/7990	0.01mg/m <sup>3</sup> (o)(t)	5mg/m <sup>3</sup>	* See 29CFR1910.1018; O-Ca; t-A1; substance for which an ACGIH BEI exists
<b>Asbestos, all forms</b> 1332-21-4 12172-73-5 12001-29-5 12001-28-4		NRP100	8940/8990 7940/7990	0.1 f/cc (o) (t)*; 1.0 f/cc (s)-(o) 30 minutes		*Fiber longer than 5 um; aspect ratio > 3:1 set by 400-450 X mag. (4 mm objective) pcm. See 29CFR1910.1001 & 1926.58; A-1; O-Ca
<b>Asphalt (petroleum; Bitumen) Fume</b> 8052-42-4		OV/RP	8100+8970/8940 7100+8970/7940	0.5mg/m <sup>3</sup> (t)* Soluble aerosol as benzene (or equivalent method) inhalable particulate		2740R95/2840R95 may be suitable for some app's. t-A4
<b>Azinphos-methyl</b> 86-50-0		OV/RP	8100+8970/8940 7100+8970/7940	0.2mg/m <sup>3</sup> (o)(t); -*skin- -SEN-	10mg/m <sup>3</sup>	Substance for which an ACGIH BEI exists, t-A4; *measured as inhalable fraction and vapor
<b>-B-</b>						
<b>Barium-Soluble Compounds (as Ba)</b> 7440-39-3		N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	0.5mg/m <sup>3</sup> (o)(t) {water based}	50mg/m <sup>3</sup> (as Ba)	t-A4
<b>Barium Sulfate</b> 7725-43-7		N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	Total dust 10mg/m <sup>3</sup> (t), 15mg/m <sup>3</sup> (o); Respirable fraction 5mg/m <sup>3</sup> (o)		Total dust containing no Asbestos and <1% Crystalline Silica
<b>Benzene</b> 71-43-2	Benzol; Coal Tar Naptha; Phenylhydride	OV	8100 7100	1 ppm (o); 5 ppm (s)-(o); 0.5 ppm (t); 2.5 (s)-(t) -skin-	500 ppm	t-A1. Change cartridge every shift. See table Z-2 and 29CFR1910.1028; O-Ca; 1/2 mask allowed with constant monitoring. Substance for which an ACGIH BEI exists.
<b>Benzenethiol</b> 108-98-5	See Phenyl Mercaptan					
<b>Benzyl Chloride</b> 100-44-7	Chloromethylbenzene, a-chlorotoluene	FF-OV/AG	9001/2/3+ 7300/7600	1 ppm (o)(t)	10 ppm	t-A3 Add particulate prefilter if particulate is present

Chemical – CAS#	Synonyms	Filter Type	Moldex Suggested	TLV(t) PEL(o)	IDLH	Comments
<b>Benzoyl Peroxide</b> 94-36-0	Dibenzoyl Peroxide	OV/N	8100+8910 7100+8910	5mg/m <sup>3</sup> (o)(t)	1,500mg/m <sup>3</sup>	t-A4
<b>Beryllium &amp; Compounds (as Be)</b> 7440-41-7		NRP100	2730N100 2360P100 8940/8990 7940/7990	0.002mg/m <sup>3</sup> (o)(t) 0.005mg/m <sup>3</sup> (c)-(o); 0.01 mg/m <sup>3</sup> (c)-(t) [0.025mg/m <sup>3</sup> for 30 min. peak/8 hr. shift (c)-(o)]	4mg/m <sup>3</sup>	t-A1; ACGIH NIC to 0.0005 mg/m <sup>3</sup> (inhalable fraction), 0.0002 STEL/CEIL (inhalable fraction) SEN, Skin.
<b>Biphenyl</b> 92-52-4	Diphenyl; Phenylbenzene	OV/N	8100+8910 7100+8910	0.2 ppm (o)(t)	100mg/m <sup>3</sup>	
<b>Bismuth Telluride un-doped, as Bi<sub>2</sub>Te<sub>3</sub></b> 1304-82-1	Bismuth Sesquiterelluride	N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	Total dust 15mg/m <sup>3</sup> (o) 10mg/m <sup>3</sup> (t); Respirable fraction 5mg/m <sup>3</sup> (o)		t-A4
<b>Bismuth Telluride; Se-doped, as Bi<sub>2</sub>Te<sub>3</sub></b> 1304-82-1		N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	5mg/m <sup>3</sup> (t)		t-A4
<b>Borates, compounds, Inorganic</b> 12179-04-3, 1303-96-4 1330-43-4, 10043-35-3		N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	2.0mg/m <sup>3</sup> (t) inhalable 6.0mg/m <sup>3</sup> (s)-(t) inhalable		
<b>Boron Oxide</b> 1303-86-2	Anhydrous Boric Acid; Boric Anhydride; Boric Oxide	N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	Total Dust 10mg/m <sup>3</sup> (t), 15mg/m <sup>3</sup> (o)	2,000mg/m <sup>3</sup>	
<b>Bromine</b> 7726-95-6	Molecular bromine	FF-OV/AG	9001/2/3+ 7300/7600	0.1 ppm (o)(t) 0.2 ppm (s)-(t)	3 ppm	
<b>Bromoform</b> 75-25-2	Methyl tribromide, Tribromomethane	FF-OV	9001/2/3+ 7100	0.5 ppm (o)(t) -skin-	850 ppm	t-A3
<b>1,3-Butadiene</b> 106-99-0	Biethylene; Bivinylyl Butadiene; Divinylyl Erythrene; Vinyl Ethylene	OV	7100 8100	1 ppm (o) <sup>1,2</sup> ; 2 ppm (t) [5 ppm (s)(o)]	2,000 ppm [10% Lower explosion limit]	See OSHA 1910.1051; t-A2 1) Replace cartridge every 4 hours for con- centration > 5 ppm. 2) Replace cartridge every 3 hours for con- centration > 10 ppm.
<b>2-Butanone</b> 78-93-3	Methyl Ethyl Ketone, MEK, Methyl acetone, Ethyl methyl ketone	FF-OV	9001/2/3+ 7100	200 ppm (o)(t) 300 ppm (s)-(t)	3000 ppm	Substance for which ACGIH BEI exists
<b>2-Butoxy Ethanol Acetate</b> 112-07-2	2-Butoxyethyl Acetate; Butyl Cellosolve Acetate; Butyl Cellosolve Acetate; Butyl Glycol Acetate; EGBEA; Ektasolve EB; Ethylene Glycol Monobutyl Ether Acetate	OV	7100 8100	20 ppm (t)	2,000 ppm [10% Lower explosion limit]	t-A3
<b>2-Butoxyethanol</b> 111-76-2	Butyl Cellosolve®, Butyl oxitol, Dowanol® EB, EGBE, Ektasolve EB®, Ethylene glycol monobutyl ether, Jeffersol EB	FF-OV	9001/2/3+ 7100	50 ppm (o) 20 ppm (t) -skin-	700 ppm	Substance for which ACGIH BEI exists Add particulate prefilter if particulate is present
<b>n-Butyl Acetate</b> 123-86-4	Butyl acetate, n-Butyl ester of acetic acid, Butyl ethanoate	FF-OV	9001/2/3+ 7100	150 ppm (o)(t) 200 ppm (s)-(t)	1700 ppm [10%LEL]	Add particulate prefilter if particulate is present
<b>sec-Butyl Acetate</b> 105-46-4	sec-Butyl ester of acetic acid, 1-Methylpropyl acetage	FF-OV	9001/2/3+ 7100	200 ppm (o)(t)	1700 ppm [10%LEL]	Add particulate prefilter if particulate is present
<b>tert-Butyl Acetate</b> 540-88-5	tert-Butyl ester of acetic acid	FF-OV	9001/2/3+ 7100	200 ppm (o)(t)	1500 ppm [10%LEL]	
<b>Butyl Acrylate</b> 141-32-2	Butyl-2 Propenoate; Butyl Ester of Acrylic Acid	OV	7100 8100	2 ppm (t) -SEN-\		t-A4
<b>n-Butyl Alcohol</b> 71-36-3	1-Butanol, n-Butanol, Butyl alcohol, 1-Hydroxybutane, n-Propyl carbinol	FF-OV	9001/2/3+ 7100	20 ppm (o) 100 ppm (t)	1400 ppm [10%LEL]	
<b>sec-Butyl Alcohol</b> 78-92-2	2-Butanol, Butylene hydrate, 2-Hydroxybutane, Methyl ethyl carbinol	FF-OV	9001/2/3+ 7100	150 ppm (o) 100 ppm (t)	2000 ppm	
<b>tert-Butyl Alcohol</b> 75-65-0	2-Methyl-2-propanol, Trimethyl carbinol, tert-Butanol	FF-OV	9001/2/3+ 7100	100 ppm (o)(t)	1600 ppm	
<b>n-Butylamine</b> 109-73-9	1-Aminobutane	AM	7400/8400 7600/8600	5 ppm (c)-(o)(t) -skin-	300 ppm	Not specifically approved, but better service life than O.V.

Chemical – CAS#	Synonyms	Filter Type	Moldex Suggested	TLV(t) PEL(o)	IDLH	Comments
<b>Butylated Hydroxytoluene</b> 128-37-0	Butylated Hydroxytoluene, BHT 2, 6-Di-tert-Butyl-p-Cresol, 4-Methyl-2, 6-di-tert-butyl phenol, Dibutylated Hydroxytoluene	FF-OV/N95	9001/2/3+ 7100+8910	2mg/m <sup>3</sup> (t) *	N.D.	*Measured as inhalable fraction and vapor
<b>n-Butyl Lactate</b> 138-22-7	Lactic Acid Butylester	OV	7100 8100	5 ppm (t)		
<b>Tert-Butyl Chromate (as CrO<sub>3</sub>)</b> 1189-85-1		N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	0.005 mg/m <sup>3</sup> (c)-(o)(t); -skin-	15mg/m <sup>3</sup> as Cr(VI)	
<b>Butyl Mercaptan</b> 109-79-5	n-Butanethiol; 1-Mercaptobutane	OV	7100 8100	0.5 ppm (t) 10 ppm (o)	500 ppm	
<b>o-sec-Butyl-Phenol</b> 89-72-5	2-sec-Butylphenol	OV/RP	7100+8970/7940 8100+8970/8940	5 ppm (t); -skin-		
<b>-C-</b>						
<b>Cadmium, Dust as Cd</b> 7440-43-9		NRP100	2730N100 2360P100 7940/7990 8940/8990	Total (inhalable) dust/particulates 0.005 mg/m <sup>3</sup> (o) 0.01 mg/m <sup>3</sup> (t); Respirable 0.002 mg/m <sup>3</sup> (t)	9 mg/m <sup>3</sup>	See 29CFR1910.1027 and Table Z-2; O-Ca; t-A2. Substance for which an ACGIH BEI exists.
<b>Cadmium, Fume</b> 7440-43-9	Cadmium Oxide Fume	NRP100	2730N100 2360P100 7940/7990 8940/8990	Total (inhalable) dust/particulate 0.005 mg/m <sup>3</sup> (o) 0.01 mg/m <sup>3</sup> (t); Respirable 0.002 mg/m <sup>3</sup> (t)	9 mg/m <sup>3</sup>	See 29CFR1910.1027 and Table Z-2; O-Ca; t-A2. Substance for which an ACGIH BEI exists.
<b>Calcium Arsenate</b> 7778-44-1						See 29CFR1910.1018
<b>Calcium Carbonate</b> 471-34-1 1317-65-3	Marble	N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	Total particulates 15 mg/m <sup>3</sup> (o) Respirable fraction 5 mg/m <sup>3</sup> (o)		
<b>Calcium Cyanamide</b> 156-62-7	Lime Nitrogen; Calcium Carbimide	N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	0.5 mg/m <sup>3</sup> (t)		t-A4
<b>Calcium Hydroxide</b> 1305-62-0	Calcium Hydrate; Hydrated Lime; Caustic Lime	N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	Total dust 5 mg/m <sup>3</sup> (t), 15 mg/m <sup>3</sup> (o); Respirable fraction 5 mg/m <sup>3</sup> (o)		
<b>Calcium Oxide</b> 1305-78-8	Quicklime; Pebble Lime	N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	5 mg/m <sup>3</sup> (o); 2 mg/m <sup>3</sup> (t) 25 mg/m <sup>3</sup>		
<b>Calcium Silicate (synthetic) (non-fibrous)</b> 1344-95-2	Calcium Metasilicate; Portland Cement; Wallastonite	N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	Total dust 15 mg/m <sup>3</sup> (o) 10 mg/m <sup>3</sup> (t); Respirable fraction 5 mg/m <sup>3</sup> (o)		Total dust containing no Asbestos and <1% Crystalline Silica, t-A4
<b>Calcium Sulfate</b> 7778-18-9	(See Plaster of Paris)					
<b>Camphor</b> 76-22-2	2-Camphonone, Gum camphor, Laurel camphor, Synthetic camphor	FF-OV/N95	9001/2/3+ 7100+8910	2 ppm (o)(t) 3 ppm (s)-(t)	200 mg/m <sup>3</sup>	
<b>Caprolactam Vapor and Aerosol</b> 105-60-2	2-Oxohexamethyleneimine; Amineocaproic Lactam	OV/N	7100+8910 8100+8910	5.0 mg/m <sup>3</sup> (t)*; 3.0 mg/m <sup>3</sup> (s)-(t)		t-A5 *Measured as inhalable fraction and vapor
<b>Captan (Inhalable Fraction)</b> 133-06-2	N-(Trichloromethylthio) 4-Cyclohexene-1,2-Dicarboximide	N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	5 mg/m <sup>3</sup> (t)		SEN
<b>Carbon Black</b> 1333-86-4	Channel Black; Lamp Black; Furnace Black; Thermal Black; Acetylene Black	N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	3.5 mg/m <sup>3</sup> (o)(t)	1,750 mg/m <sup>3</sup>	t-A4 ACGIH NIC to 3mg/m <sup>3</sup> measured as inhalable fraction & NIC t-A3
<b>Carbon Disulfide</b> 75-15-0	Carbon Bisulfide; Carbon Disulphide; Carbon Bisulphide; Carbon Bisulfur; Dithiocarbonic Anhydride; Carbon Sulfide; Sulphocarbonic Anhydride; Weevitox	OV	7100 8100	10 ppm (t); 20 ppm -(o); 30 ppm -(c)-(o); [100 ppm (c)-(o) 30 min. peak/8 hour shift]; -skin-	500 ppm	Substance for which an ACGIH BEI exists
<b>Catechol</b> 120-80-9	Pyrocatechol	OV/N	7100+8910 8100+8910	5 ppm (t); -skin-		t-A3

Chemical – CAS#	Synonyms	Filter Type	Moldex Suggested	TLV(t) PEL(o)	IDLH	Comments
<b>Cellulose</b> 9004-34-6	Paper Fiber	N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	Total Dust 15 mg/m <sup>3</sup> (o), 10 mg/m <sup>3</sup> (t); Respirable fraction 5 mg/m <sup>3</sup> (o)		
<b>Cesium Hydroxide</b> 21351-79-1	Cesium Hydrate	N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	2 mg/m <sup>3</sup> (t)		
<b>Chlorine</b> 7782-50-5		AG	7200/8200 7300/8300 7600/8600	0.5 ppm (t); 1 ppm (c)(s)-(o)(t)	10 ppm	Chemical goggles required when using a half mask, t-A43
<b>Chlorine Dioxide</b> 10049-04-4		AG	7200/8200 7600/8600	0.1 ppm (t)(o); 0.3 ppm (s)-(t)	5 ppm	Chemical goggles required when using a half mask
<b>Chloroacetophenone</b> 532-27-4	2-Chloroacetophenone, Chloromethyl phenyl ketone, Mace®, Phenacyl chloride, Phenyl chloromethyl ketone, tear gas, α-Chloroacetophenone, α-Chloroacetophenone	FF-OV/N95	9001/2/3+ 7100+8910	0.05 ppm (o)(t)	2.3 ppm	t-A4
<b>Chlorobenzene</b> 108-90-7	Benzene Chloride; Chlorobenzol; MCB Monochlorobenzene; Phenylchloride	OV	7100 8100	75 ppm (o); 10 ppm (t)	1,000 ppm	Substance for which ACGIH BEI exists; t-A3
<b>Chlorodiphenyl (42% chlorine)</b> 53469-21-9	Aroclor® 1242, polychlorinated diphenyl, PCBs	FF-OV/N95	9001/2/3+ 7100+8910	1 ppm (o)(t) -skin-	5 mg/m <sup>3</sup>	
<b>Chlorodiphenyl (54% chlorine)</b> 11097-69-1	Aroclor® 1254, polychlorinated diphenyl, PCBs	FF-OV/N95	9001/2/3+ 7100+8910	0.5 ppm (o)(t)	5 mg/m <sup>3</sup>	t-A3
<b>2-Chloroethanol</b> 107-07-3	See Ethylene Chlorohydrin					
<b>o-Chlorotoluene</b> 95-49-8	1-Chloro 2-Methylbenzene; 2-Chloro-1-Methylbenzene; 2-Chlorotoluene; o-Tolylchloride	OV	7100 8100	50 ppm (t)		For specific information, refer to: NIOSH Pocket Guide to Chemical Hazards
<b>Chloropicrin</b> 76-06-2	Nitrochloroform, Nitrotrichloromethane, Trichloronitromethane	FF-OV	9001/2/3+ 7100	0.1 ppm (o)(t)	2 ppm	t-A4
<b>Chromium, Metal Dusts (as Cr)</b> 7440-47-3		N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	0.5mg/m <sup>3</sup> (t); 1mg/m <sup>3</sup> (o)	250mg/m <sup>3</sup>	t-A4
<b>Chromium, Metal Fume (as Cr)</b> 7440-47-3		N	2310/2315N99 2400/2800N95	0.5mg/m <sup>3</sup> (t); 1mg/m <sup>3</sup> (o)	250mg/m <sup>3</sup>	For specific information, refer to NIOSH Pocket Guide to Chemical Hazards; t-A4
<b>Chromium (II) Compounds – (as Cr)</b>		N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	0.5mg/m <sup>3</sup> (o)	250mg/m <sup>3</sup>	For specific information, refer to NIOSH Pocket Guide to Chemical Hazards
<b>Chromium (III) Compounds – (as Cr)</b>		N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	0.5mg/m <sup>3</sup> (o)(t)	25mg/m <sup>3</sup>	For specific information, refer to NIOSH Pocket Guide to Chemical Hazards; t-A4
<b>Chromium (VI) Compounds – Dusts; Water Soluble (as Cr) Includes Chromic Acid and (see also Lead and Zinc Chromate)</b>		N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	0.05mg/m <sup>3</sup> (t); 0.005mg/m <sup>3</sup> (o); as Cr(VI) 0.1mg CrO <sub>3</sub> /m <sup>3</sup> (c)-(o)	15mg/m <sup>3</sup>	t-A1; Also see specific information. Substance for which an ACGIH BEI exists. For specific information, refer to OSHA 29CFR1910.1026
<b>Chromium (VI) Compounds; Certain Water Insolubles (as Cr)</b>		N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	0.01mg/m <sup>3</sup> (t); 0.005mg/m <sup>3</sup> (o) as Cr(VI)	15mg/m <sup>3</sup>	t-A1; For specific information, refer to OSHA 29CFR1910.1026

Chemical – CAS#	Synonyms	Filter Type	Moldex Suggested	TLV(t) PEL(o)	IDLH	Comments
<b>Coal Dust</b>		N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	Respirable fraction .4mg/m <sup>3</sup> (t) Anthracite; .9mg/m <sup>3</sup> (t) Bituminous; or <u>2.4 mg/m<sup>3</sup>(o)*</u> %SiO <sub>2</sub> +2 or <u>10 mg/m<sup>3</sup>(o)**</u> %SiO <sub>2</sub> +2	15mg/m <sup>3</sup>	For specific information, refer to NIOSH Pocket Guide to Chemical Hazards; *<5% SiO <sub>2</sub> Resp.quartz fraction; **>5% SiO <sub>2</sub> Resp. quartz fraction; t-A4
<b>Coal Tar Pitch Volatiles (as Benzene Solubles)</b> 65996-93-20		RP	2740R95 7940/7990 8940/8990	0.2 mg/m <sup>3</sup> (o)(t)	80mg/m <sup>3</sup>	Confirmed Human Carcinogen; t-A1
<b>Cobalt, Metal Dusts (as Co)</b> 7440-48-4		NRP100	2730N100 2360P100 7940/7990 8940/8990	0.1 mg/m <sup>3</sup> (o); 0.02 mg/m <sup>3</sup> (t)	20 mg/m <sup>3</sup>	t-A3; substances for which an ACGIH BEI exists
<b>Cobalt, Metal Fumes (as Co)</b> 7440-48-4		NRP100	2730N100 2360P100 7940/7990 8940/8990	0.1 mg/m <sup>3</sup> (o); 0.02 mg/m <sup>3</sup> (t)	20 mg/m <sup>3</sup>	t-A3; substances for which an ACGIH BEI exists
<b>Coke Oven Emissions</b>		RP	2740R95/8970 7940/7990 8940/8990	0.15 mg/m <sup>3</sup> (o) (Benzene soluble fraction)		See 29CFR1910.1029; O-Ca
<b>Copper, Dusts and Mists (as Cu)</b> 7440-50-8		N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	1.0 mg/m <sup>3</sup> (o)(t) <b>{water based mists}</b>	100 mg/m <sup>3</sup>	
<b>Copper, Fume (as Cu)</b> 7440-50-8		N	2310/2315N99 2400/2800N95	0.1 mg/m <sup>3</sup> (o); 0.2 mg/m <sup>3</sup> (t)	100 mg/m <sup>3</sup>	
<b>Cotton Dust, (Raw)</b>		N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	0.2 mg/m <sup>3</sup> (t) – Lint free dust is measured by vertical elutriator; 1 mg/m <sup>3</sup> (o) – Respirable dust is measured by vertical elutriator; Cotton Waste processing operations (of waste recycling and ginning)	100 mg/m <sup>3</sup>	5x PEL maximum for disposables. See 29CFR1910.1043 for other grade of cotton If oil is present use 2740R95
<b>Crag Herbicide</b>	2-(2,4-Dichlorophenoxy)-Ethyl Sodium Sulfate, Sesone	N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	15mg/m <sup>3</sup> (o) total dust; 5mg/m <sup>3</sup> (o) respirable dust		t-A4
<b>o,m,p Cresol</b> 1319-77-3 08-39-4 95-48-7 106-44-5	Cresylic Acid	OV/P	7100+7940 8100+8940	5 ppm (o)(t); -skin- 20 mg/m <sup>3</sup> *	250 ppm	*measurable as inhalable fraction and vapor
<b>Cristobalite</b>	(See Silica, Crystalline)					
<b>Crotonaldehyde</b> 4170-30-3	2-Butenal, β-Methyl acrolein, Propylene aldehyde	FF-OV	9001/2/3+ 7100	2 ppm (o) 0.3 ppm (c)-(t) -skin-	50 ppm	t-A3
<b>Cumene</b> 98-82-8	Isopropyl Benzene; 2-Phenyl Propane; Cumol	OV	7100 8100	50 ppm (o)(t); -skin-	900 ppm [10% Lower explosion limit]	
<b>Cyanamide</b> 420-04-2	Cyanogenamide; Carbodiimide	N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	2 mg/m <sup>3</sup> (t)		
<b>Cyclohexane</b> 110-82-7	Benzene hexahydride, Hexahydrobenzene, Hexamethylene, Hexanapthene	FF-OV	9001/2/3+ 7100	300 ppm (o) 100 ppm (t)	1300 ppm [10% LEL]	
<b>Cyclohexylamine</b> 108-91-8	Aminocyclohexane, Aminohexahydrobenzene, Hexahydroaniline, Hexahydrobenzenamine	FF-OV	9001/2/3+ 7100	10 ppm (t)	N.D.	t-A4
<b>Cyhexatin</b> 13121-70-5	TCHH	OV/N	7100+8910 8100+8910	5mg/m <sup>3</sup>	80mg/m <sup>3</sup> 25mg/m <sup>3</sup> (as SN)	t-A4

Chemical – CAS#	Synonyms	Filter Type	Moldex Suggested	TLV(t) PEL(o)	IDLH	Comments
<b>Cyclohexene</b> 110-83-8	Benzene Tetrahydride; Tetrahydrobenzene	OV	7100 8100	300 ppm (o)(t)	2,000 ppm	
<b>Cyclohexanol</b> 108-93-0	Hexalin; Hydralin; Hydroxycyclohexane; Anol; Hexahydrophenol; Cyclohexyl Alcohol	OV	7100 8100	50 ppm (o)(t); -skin-	400 ppm	Add 8970/8940 if particulate is present
<b>Cyclohexanone</b> 108-94-1	Pimelic Ketone; Cyclohexyl Ketone	OV	7100 8100	20 ppm (t); 50 ppm (o); -skin-	700 ppm	t-A3
<b>Cyclonite</b> 121-82-4	RDX; Sym-Trimethylene Trinitramine; Hexahydro-1,3,5-Trinitro-Sym-Triazine	N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	0.5 mg/m <sup>3</sup> (t); -skin-		t-A4
<b>Cyclopentadiene</b> 542-92-7	1,3-Cyclopentadiene	OV	7100 8100	75 ppm (o)(t)	750 ppm	
<b>-D-</b>						
<b>2,4-D</b> 94-75-7	Dichlorophenoxyacetic Acid; 2,4-Dichlorophenoxyacetic Acid	OV/NRP100	7100+7940 8100+8940	10 mg/m <sup>3</sup> (o)(t)	100 mg/m <sup>3</sup>	t-A4
<b>Diacetone Alcohol</b> 123-42-2	4-hydroxy-4 methyl-2 pentanone, Diacetone, 2-Methyl-2-pentanol-4-one	FF-OV	9001/2/3+ 7100	50 ppm (o)(t)	1800 ppm {10% LEL}	t-A4
<b>Diatomaceous earth (uncalcined Silica-amorphous)</b> 61790-53-2	(See Silica)					
<b>Dibutyl phthalate</b> 84-74-2	DBP; Dibutyl-1,2-Benzene dicarboxylate; Di-n-buylphthalate	OV/RP	7100+8970/7940 8100+8970/8940	5 mg/m <sup>3</sup> (o)(t)	4,000 mg/m <sup>3</sup>	
<b>Dibutyl phosphate</b> 107-66-4	Dibutyl Acid-o-Phosphate; Di-n-Butyl Hydrogen Phosphate; Dibutyl Phosphoric Acid	OV/RP	7100+8970/7940 8100+8970/8940	1 ppm (o)(t); 2 ppm (s)(t)	30 ppm	
<b>1,3-Dichloro-5,5-Dimethylhydantoin</b> 118-52-5	Dactin; DDH; Halane	OV/N	7100+78910 8100+8910	0.2 mg/m <sup>3</sup> (o)(t); 0.4 mg/m <sup>3</sup> (s)(t)	5 mg/m <sup>3</sup>	
<b>o-Dichlorobenzene</b> 95-50-1	o-DCB; 1,2-Dichlorobenzene; ortho-Dichlorobenzene; Dichlorocide	FF-OV	9001/2/3+ 7100	25 ppm (t) 50 ppm (c)-(o)	200 ppm	t-A4 Add particulate prefilter if particulate is present
<b>p-Dichlorobenzene</b> 106-46-7	p-DCB; 1,4-Dichlorobenzene; para-Dichlorobenzene; Dichlorocide	FF-OV/N95	9001/2/3+ 7100+8910	10 ppm (t) 75 ppm (o)	150 ppm	t-A3
<b>1,2 Dichloroethylene</b> 540-59-0 156-59-2 156-60-3	Acetylenedichloride; Dioform	OV	7100 8100	200 ppm (o)(t)	1,000 ppm	
<b>Dichloroethyl ether</b> 111-44-4	bis(2-Chloroethyl)ether; 2,2'-Dichlorodiethyl ether, 2,2'-Dichloroethyl ether	FF-OV	9001/2/3+ 7100	5 ppm (t) [10 ppm (s)-(t)] [15 ppm (o)-(c)] -skin-	100 ppm	t-A4
<b>1,2 Dichloropropane</b> 78-87-5	(See Propylene Dichloride)					
<b>Dicyclopentadiene</b> 77-73-6		OV/N	7100+8910 8100+8910	5 ppm (t)		
<b>Dicyclopentadienyl Iron</b> 102-54-5	bis-Cyclopentadienyl Iron; Ferrocene	N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	Total dust 10mg/m <sup>3</sup> (t), 15 mg/m <sup>3</sup> (o); Respirable fraction 5 mg/m <sup>3</sup> (o)		
<b>Diethanolamine</b> 111-42-2	DEA; di- (2-Hydroxyethyl) Amine	OV	7100 8100	0.46 (t); -skin-		Add 8970/8940 if particulate is present
<b>Diethylamine</b> 109-89-7	Diethylamine; N,N-Diethylamine; N-Ethylanamine	FF-OV	9001/2/3+ 7100	5 ppm (t) 10 ppm (s)-(t) 25 ppm-(o) -skin-	200 ppm	t-A4
<b>2 Diethylaminoethanol</b> 100-37-8	2-Diethylaminoethyl Alcohol; N,N-Diethylethanolamine	OV	7100 8100	10 ppm (o); 2 ppm (t); -skin-	100 ppm	
<b>Diethyl Ether</b> 60-29-7	(See Ethyl Ether)					
<b>Diethyl Ketone</b> 96-22-0	Metacetone; Propione; 3-Pentanone; Ethyl Propionyl	OV	7100 8100	200 ppm (t)		ACGIH NIC to 300 ppm (s)-(t)

Chemical – CAS#	Synonyms	Filter Type	Moldex Suggested	TLV(t) PEL(o)	IDLH	Comments
<b>Diethyl Phthalate</b> 84-66-2	Ethylphthalate; DEP	RP	2740R95/8970 7940/7990 8940/8990	5 mg/m <sup>3</sup> (t)		t-A4
<b>Diisobutyl Ketone</b> 108-83-8	DIBK; sym-Diisopropyl acetone; 2,6-Dimethyl-4-hepanone; Isovalerone; Valerone	FF-OV	9001/2/3+ 7100	25 ppm (t) 50 ppm (o)	500 ppm	Add particulate prefilter if particulate is present
<b>Diisopropylamine</b> 108-18-9	DIPA, N-(1-Methylethyl)-2-propanamine	FF-OV	9001/2/3+ 7100	5 ppm (o)(t) -skin-	200 ppm	
<b>Dimethylamino Benzene</b> 1300-73-8	(See Xylidine)					
<b>Dimethylamine</b> 124-40-3	Anhydrous Dimethylamine	AM	7400 8400	5 ppm (t); 10 ppm (o); 15 ppm (s)-(t)-skin-	500 ppm	AM not specifically approved & short OV service life; t-A4
<b>Dimethylaniline</b> 121-69-7	N,N-Dimethylaniline	OV	7100 8100	5 ppm (o)(t); 10 ppm (s)-(t); -skin-	100 ppm	Substance for which an ACGIH BEI exists, t-A4
<b>Dimethyl-1,2-Dibromo-2,2-Dichloroethyl Phosphate</b> 300-76-5 ing		N	2310/2315N99 2400/2800N95	3 mg/m <sup>3</sup> (o);-skin- .1 mg/m <sup>3</sup>	200 mg/m <sup>3</sup>	Substance for which an ACGIH BEI (Acetyl-Cholinesterase Inhibiti-Pesticide) exists, t-A4; inhalable fraction & vapor/aerosol & SEN
<b>Dimethyl Phthalate</b> 131-11-3	DMP	OV/RP	7100+8970/7940 8100+8970/8940	5 mg/m <sup>3</sup> (o)(t)	2,000 mg/m <sup>3</sup>	
<b>Dinitrobenzene (All Isomers)</b> 100-25-4; 528-29-0; 99-65-0	o-Dinitrobenzene; 1,2 Dinitrobenzene; m-Dinitrobenzene; 1,3-Dinitrobenzene; p-Dinitrobenzene; 1-4-Dinitrobenzene	OV/N	7100+8910 8100+8910	1 mg/m <sup>3</sup> (o)(t); -skin-	50 mg/m <sup>3</sup>	Substance for which an ACGIH BEI exists (Methemoglobin Inducer) exists
<b>4,6 Dinitro-o-Cresol</b> 534-52-1		N	2310/2315N99 2310/2315N99	0.2 mg/m <sup>3</sup> (o)(t); -skin-	5 mg/m <sup>3</sup>	
<b>3,5 Dinitro-o-Toluamide</b> 148-01-6	Dinitolmide	N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	1 mg/m <sup>3</sup> (t)		t-A4 ACGIH NIC to 1mg/m <sup>3</sup>
<b>Dinitrotoluene</b> 25321-14-6	Dinitroluol; DNT; Methyl dinitrobenzene	OV/P100	7100+7940 8100+8940	1.5 mg/m <sup>3</sup> (o); 0.2 mg/m <sup>3</sup> (t); -skin-	50 mg/m <sup>3</sup>	Substance for which an ACGIH BEI (Methemoglobin Inducer) exists; t-A3
<b>Dioxane</b> 123-91-1	Diethylene Dioxide; Diethylene Ether; Dioxane; p-Dioxane; 1,4-Dioxane	OV	7100 8100	20 ppm (t);100 ppm (o) -skin-	500 ppm	t-A3
<b>Diphenyl</b> 92-52-4	(See Biphenyl)					
<b>Diphenylamine</b> 122-39-4	DPA; N-phenylaniline	N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	10 mg/m <sup>3</sup> (t)		May want to use 2400N95 if odor is a problem, t-A4
<b>Di-sec-octylphthalate</b> 117-81-7	DOP,bis-(2-Ethylhexyl) Phthalate; Di-2-Ethylhexyl Phthalate; DEHP	RP	2740R95 7940/7990 8970/8940/8990	5 mg/m <sup>3</sup> (o)(t);	5,000 mg/m <sup>3</sup>	ACGIH NIC to delete STEL; t-A3
<b>1-Dodecanethiol</b> 112-55-0	n-Dodecylmercaptan, n-Laurylmercaptan, 1-Mercaptododecane	OV	7100 8100	0.1 ppm (t)		R or P filter may be needed with oily aerosols
<b>-E-</b>						
<b>Emery</b> 1302-74-5	Corundum; Aluminum Oxide; Aluminum Trioxide	N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	15mg/m <sup>3</sup> (o); Respirable fraction 5 mg/m <sup>3</sup> (o)		
<b>Endrin</b> 72-20-8		OV/NRP100	7100+7940 8100+8940	0.1 mg/m <sup>3</sup> (o)(t); -skin-	2 mg/m <sup>3</sup>	t-A4
<b>Epoxies</b>	(See Specific Compounds)					
<b>Ethanolamine</b> 141-43-5	Ethylolamine; Monoethanolamine; B-Aminoethyl alcohol; 2-Aminoethanol; 2-Hydroxyethylamine	OV	7100 8100	3 ppm (o)(t); 6 ppm (s)-(t)	30 ppm	
<b>2-Ethoxyethanol</b> 110-80-5	Ethylene Glycol Monoethyl Ether; Glycol Monoethyl Ether; Cellosolve solvent	OV	7100 8100	5 ppm (t); 100 ppm (o); -skin-	500 ppm	Substances for which ACGIHBEI exists

Chemical – CAS#	Synonyms	Filter Type	Moldex Suggested	TLV(t) PEL(o)	IDLH	Comments
<b>2-Ethoxy Ethylacetate</b> 111-15-9	Cellosolve Acetate; Ethylene Glycol Monoethyl Ether Acetate	OV	7100 8100	100 ppm (o); 5 ppm (t); -skin-	500 ppm	Substances for which ACGIHBEI exists
<b>Ethyl Acetate</b> 141-78-6	Acetic ester, Acetic ether, Ethyl ester of acetic acid, Ethyl ethanoate	FF-OV	9001/2/3+ 7100	400 ppm (o)(t)	2000 ppm [10% LEL]	
<b>Ethyl Acrylate</b> 140-88-5	Ethyl acrylate (inhibited), Ethyl ester of acrylic acid, Ethyl propenoate	FF-OV	9001/2/3+ 7100	5 ppm (t) 15 ppm (s)-(t) 25 ppm (o) -skin-	300 ppm	
<b>Ethyl Amyl Ketone</b> 541-85-5	5-methyl-3-heptanon; ethyl sec-amyl ketone; amyl ethyl ketone; 3-methyl-5-heptanone; EAK; ethyl amyl ketone	FF-OV	9001/2/3+ 7100	10 ppm (t) 25 ppm (o)	100 ppm	
<b>Ethyl Benzene</b> 100-41-4	Phenylethane; Ethylbenzol	OV	7100 8100	20 ppm (t); 100 ppm (o); 125 ppm (s)-(t)	800 ppm	Add 8940 if particulate [10% Lower is present. Substance explosion limit] for which a t-A3; ACGIH BEI exists;
<b>Ethyl Butyl Ketone</b> 106-35-4	3-Heptanone	OV	7100 8100	50 ppm (o)(t); 75 ppm (s)-(t)	1,000 ppm	Add 8940 if particulate is present
<b>Ethylene Chlorohydrin</b> 107-07-3	2-Chloroethanol; 2-Chloroethyl Alcohol	OV	7100 8100	5 ppm (o)- 1 ppm (c)-(t); -skin	7 ppm	t-A4
<b>Ethylene Diamine</b> 107-15-3	1,2-Diaminoethane; 1,2-Ethanediamine; Ethylenediamine (anhydrous)	FF-OV	9001/2/3+ 7100	10 ppm (o) (t) -skin-	1000 ppm	t-A4
<b>Ethylene Dibromide</b> 106-93-4	1,2-Dibromoethane; Ethylene bromide; Glycol dibromide, EDB	FF-OV	9001/2/3+ 7100	20 ppm (o) 30 ppm (c)-(o) 50 ppm 5 minute peak per 8-hr shift	100 ppm	
<b>Ethylene Glycol, Aerosol</b> 107-21-1	Ethylene Alcohol; Glycol; 1,2-Ethanediol	OV/N	7100+8910 8100+8910	100 mg/m <sup>3</sup> (c)-(t)		t-A4
<b>Ethyl Ether</b> 60-29-7	Diethyl Ether; Ethyl Oxide; Ether	OV	7100 8100	400 ppm (o)(t); 500 ppm (s)-(t)	1,900 ppm [10% Lower explosion limit]	Short service life; t-A4
<b>Ethylidene Norbornene</b> 16219-75-3	ENB, 5-Ethylidenebicyclo(2.2.1)hept-2-ene, 5-Ethylidene-2-norbornene	FF-OV	9001/2/3+ 7100	5 ppm (c)-(t)	N.D.	
<b>Ethyl Mercaptan</b> 75-08-1	Ethanethiol; Ethyl Sulfhydrate	OV	7100 8100	0.5 ppm (t); 10 ppm (c)-(o)	500 ppm	
<b>n-Ethylmorpholine</b> 100-74-3	4-Ethylmorpholine	FF-OV	9001/2/3+ 7100	5 ppm (t) 20 ppm (o) -skin-	100 ppm	
<b>Ethyl Silicate</b> 78-10-4	Silicic Acid Tetraethylester	OV	7100 8100	10 ppm (t) 100 ppm (o)	700 ppm	
<b>-F-</b>						
<b>Ferbam</b> 14484-64-1	Carbamate Dimethyldithiocarbamic Acid	N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	Total dust 15 mg/m <sup>3</sup> 10 mg/m <sup>3</sup> (t)	800 mg/m <sup>3</sup>	t-A4
<b>Ferrovandium Dust</b> 12604-58-9		N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	1 mg/m <sup>3</sup> (o)(t); 3 mg/m <sup>3</sup> (s)-(t)	500 mg/m <sup>3</sup>	
<b>Fibrous Glass Dust, Glass Fibers, Glass Wool, Rock Wool, Slag Wool, Continuous Filament Glass Fibers**</b>		N95	EZ22/EZ23N95 2200/2300N95 2600/2700N95	1 f/cc (t)*; Total 15 mg/m <sup>3</sup> (o); respirable fraction 5 mg/m <sup>3</sup> (o); **5mg/m <sup>3</sup> (measured as inhalable fraction)		*(t)-A3 Respirable fiber longer than 5 u; diameter; aspect ratio >3:1 as det. by mem. Filt. meth @ 400-450 X mag (4mm obj.) phas. cont. illum.
<b>Flourides (as F)</b>	(See Specific Compound)					

Chemical – CAS#	Synonyms	Filter Type	Moldex Suggested	TLV(t) PEL(o)	IDLH	Comments
<b>Formaldehyde</b> 50-00-0	Methylene Oxide; Formalin	FORM	7500/7600 8500/8600	0.75 ppm (o); 0.3 ppm (c)-(t); 2 ppm (s)-(o)	20 ppm	See 29CFR1910.1048; O-Ca; t-A2; Change every 3 hours; wear gas-proof goggles with half-mask. Do not use same cartridge for any other gases or vapors; SEN
<b>Fufural</b> 98-01-1	Fural, 2-Furancarboxaldehyde, Furfuraldehyde, 2-Furfuraldehyde	FF-OV	9001/2/3+ 7100	2 ppm (t) 5 ppm (o) -skin-	100 ppm	t-A3 Substance for which ACGIH BEI exists
<b>Fufuryl Alcohol</b> 98-00-0	2-Furylmethanol, 2-Hydroxymethylfuran	FF-OV	9001/2/3+ 7100	10 ppm (t) 50 ppm (o) 15 ppm (s)-(t) -skin-	75 ppm	Add particulate prefilter if particulate is present
<b>-G-</b>						
<b>Gasoline</b> 8006-61-9	Motor fuel, Motor spirits, Natural gasoline, Petrol [Note: A complex mixture of volatile hydrocarbons (paraffins, cycloparaffins & aromatics).]	FF-OV	9001/2/3+ 7100	300 ppm (t) 500 ppm (s)-(t) Bulk handling	N.D.	t-A3
<b>Glutaraldehyde</b> 111-30-8	Glutaric Dialdehyde; 1,5-Pentanedial	FF-OV	9001/2/3+ 7100	0.05 ppm (c)-(t)* -SEN-	N.D.	Add particulate prefilter if particulate is present *activated or inactivated
<b>Glycerin, Mist</b> 56-81-5	Glycerol	RP	2740R95/8970 7940, 7990 8940, 8990	Total dust 15 mg/m <sup>3</sup> (o), 10 mg/m <sup>3</sup> (t) Respirable fraction 5 mg/m <sup>3</sup> (o)		
<b>Glycol monoethyl Ether</b> 110-80-5	(See 2-Ethoxyethanol)					
<b>Grain Dust (Oat, Wheat, Barley)</b>		N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	4 mg/m <sup>3</sup> (t)*; 10 mg/m <sup>3</sup> (o) -SEN-		*Inhalable dust
<b>Graphite (Natural)</b> 7782-42-5	Plumbago; Potelot; Corbo Minerals; Black Lead; Silver Lead	N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	2.0 mg/m <sup>3</sup> (t)* (all forms except graphite fibers); 15MPPCF(o)	1,250 mg/m <sup>3</sup>	*Respirable particulate fraction
<b>Graphite (Synthetic) (all forms except fibers)</b> 7440-44-0		N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	Total dust 15 mg/m <sup>3</sup> (o); Respirable fraction 5 mg/m <sup>3</sup> (o), 2.0 mg/m <sup>3</sup> (t)*		*All forms except graphite fibers
<b>Gypsum</b> 13397-24-5	(See Plaster of Paris)					
<b>-H-</b>						
<b>Hafnium &amp; Compounds, Dusts &amp; Mists</b> 7440-58-6	Celtium; Elemental Hafnium; Hafnium metal	N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	0.5 mg/m <sup>3</sup> (o)(t)	50 mg/m <sup>3</sup> (as Hf)	
<b>n-Heptane</b> 142-82-5	Normal heptane; n-heptane	OV	7100 8100	400 ppm (t); 500 ppm -(o) 500 ppm (s)-(t)	750 ppm	
<b>2-Heptanone</b> 110-43-0	(See Methyl n-amyl ketone)					
<b>3-Heptanone</b> 106-35-4	(See Ethyl butyl ketone)					
<b>Hexachloroethane</b> 67-72-1	Perchloroethane	OV/N	7100+8910 8100+8910	1 ppm (o)(t); -skin-	300 ppm	t-A3
<b>Hexachloronaphthalene</b> 1335-87-1	Halowax 1014	OV/N	7100+8910 8100+8910	0.2 mg/m <sup>3</sup> (o)(t); -skin-	2 mg/m <sup>3</sup>	
<b>n-Hexane</b> 110-54-3	Hexane; Hexylhydride	OV	7100 8100	50 ppm (t); 500 ppm (o); -skin-	1100 ppm [10% lower explosion limit	Substance for which ACGIHBEI exists
<b>Hexane (Isomers other than n-Hexane)</b>	DiethylmethyImethane; Diisopropyl Isohexane	OV	7100 8100	500 ppm (t); 1,000 ppm (s)-(t)		

Chemical – CAS#	Synonyms	Filter Type	Moldex Suggested	TLV(t) PEL(o)	IDLH	Comments
<b>2-Hexanone</b> 591-78-6	Methyl n-Butyl Ketone; MBK	OV	7100 8100	5 ppm (t); 100 ppm (o); 10 ppm (s)-(t); -skin-	1,600 ppm	
<b>Hexone</b> 108-10-1	Methyl Isobutyl Ketone, Isobutyl methyl ketone, 4-Methyl 2-pentanone, MIBK	FF-OV	9001/2/3+ 7100	20 ppm (t) 100 ppm (o) 75 ppm (s)-(t)	500 ppm	t-A3 Substance for which ACGIH BEI exists
<b>sec-Hexyl acetate</b> 108-84-9	1,3-Dimethylbutyl acetate; Methylisoamyl acetate	FF-OV	9001/2/3+ 7100	50 ppm (o) (t)	500 ppm	Add particulate prefilter if particulate is present
<b>Hexylene glycol</b> 107-41-5	2,4-Dihydroxy-2-methylpentane; 2-Methyl-2,4-pentanediol; 4-Methylpentane-2,4-diol	FF-OV	9001/2/3+ 7100	25 ppm (c)-(t)	N.D.	
<b>Hydrogen Bromide</b> 10035-10-6	Hydrobromic acid	AG	7200 8200	3 ppm (o) 2 ppm (c)-(t)	30 ppm	
<b>Hydrogen Chloride</b> 7647-01-0	Hydrochloric acid (when in aqueous form)	AG	7200 8200	2 ppm (c)-(t) 5 ppm (c)-(o)	50 ppm	ACGIH NIC to 2 ppm (C) & t-A4
<b>Hydrogen Fluoride (as F)</b> 7664-39-3	Anhydrous hydrogen fluoride; Aqueous hydrogen fluoride (i.e. Hydrofluoric acid); HF-A; Anhydro flouric acid; Ethching acid; Flourohydric acid; Fluoric acid; HF	FF-AG	9001/2/3+ 7200/7300/ 7600	0.5 ppm (t)* 2 ppm (c)-(t)* 3 ppm (o)* *as F, + 15 min -skin-	30 ppm	Substance for which ACGIH BEI exists
<b>Hydrogen Sulfide</b> 7783-06-4	Sulfuretted Hydrogen; Hydrosulfuric Acid; Hepatic Gas; Sewer Gas	AG	7200 8200	1 ppm (t); 5 ppm (s)-(t); 20 ppm (c)-(o); [50 ppm 10 min peak / 8 hr shift]	100 ppm	Escape only; Poor warning; Olfactory fatigue; (t)
<b>Hydrogenated Terphenyls</b> 61788-32-7		RP	2740R95 7940/7990 8940/8970/8990	0.5 ppm (t)		
<b>Hydroquinone</b> 123-31-9	p-Benzenediol; 1,4-Benzenediol; Dihydroxybenzene; 1,4-Dihydroxybenzene; Quinol	FF-OV/N95	9001/2/3+ 7100+8910	1 mg/m <sup>3</sup> (t) 2 mg/m <sup>3</sup> (o) -SEN-	50 mg/m <sup>3</sup>	t-A3
<b>- -</b>						
<b>Indene</b> 95-13-6	Indonaphthene	OV	7100 8100	5 ppm (t)		
<b>Indium, Dusts</b> 7440-74-6	Indium Metal	N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	0.1 mg/m <sup>3</sup> (t) {water soluble}		
<b>Iron Oxide, Dust &amp; Fume (as Fe)</b> Asbestos 1309-37-1	Ferric Oxide Fume	N	2310/2315N99 2400/2800N95	5 mg/m <sup>3</sup> (t)*, 10 mg/m <sup>3</sup> (o)	2,500 mg/m <sup>3</sup> (as Fe)	t-A4, *Particulate containing no  and < 1% Crystalline Silica.
<b>Iron Salts, Soluble (as Fe)</b>	Ferrous Sulfate and Chloride; Ferric Chloride & Nitrate & Sulfate	N	EZ22/EZ23N95 2200/2300N95 2400/2800N95	1 mg/m <sup>3</sup> (t)		
<b>Isoamyl Acetate</b> 123-92-2	3-Methyl-1-Butanol Acetate; Banana Oil; 3-Methylbutyl Ethanoate	OV	7100 8100	100 ppm (o) 50 ppm (t)	1,000 ppm	Add 8910 if particulate is present.
<b>Isoamyl Alcohol Primary</b> 123-5-3	Fermentation amyl alcohol, Fusel oil, Isobutyl carbinol, Isopentyl alcohol, 3-Methyl-1-butanol, Primary isoamyl alcohol	FF-OV	9001/2/3+ 7100	100 ppm (o)	500 ppm	Add particulate prefilter if particulate is present
<b>Isoamyl Alcohol Secondary</b> 6032-29-7	3-Methyl-2-butanol, Secondary isoamyl alcohol	FF-OV	9001/2/3+ 7100	100 ppm (o)	500 ppm	Add particulate prefilter if particulate is present
<b>Isobutyl Acetate</b> 110-19-0	Isobutyl ester of acetic acid, 2-Methylpropyl acetate, 2-Methylpropyl ester of acetic acid, β-Methylpropyl ethanoate	FF-OV	9001/2/3+ 7100	150 ppm (o) (t)	1300 ppm [10% LEL]	
<b>Isobutyl Alcohol</b> 78-83-1	IBA, Isobutanol, Isopropylcarbinol, 2-Methyl-1-propanol	FF-OV	9001/2/3+ 7100	50 ppm (t) 100 ppm (o)	1600 ppm	
<b>Isophorone</b> 78-59-1	3,5,5-Trimethyl-2-Cyclohexene-1-one	OV	7100 8100	25 ppm (o); 5 ppm (c)-(t)	200 ppm	Add 8910 if particulate is present; A-3

Chemical – CAS#	Synonyms	Filter Type	Moldex Suggested	TLV(t) PEL(o)	IDLH	Comments
<b>Isopropoxy-Ethanol</b> 109-59-1	IPE, Isopropyl Glycol; Isopropyl Cellosolve	OV	7100 8100	25 ppm (t); -skin-		
<b>Isopropyl Alcohol</b> 67-63-0	Dimethyl carbinol, IPA, Isopropanol, 2-Propanol, sec-Propyl alcohol, Rubbing Alcohol	FF-OV	9001/2/3+ 7100	400 ppm (o) 200 ppm (t) 400 (s)-(t)	2000 ppm [10% LEL]	Substance for which ACGIH BEI exists
<b>Isopropyl Acetate</b> 109-59-1	Isopropyl Ester of Acetic Acid, 1-Methylethyl ester of acetic acid, 2-Prop	FF-OV	9001/2/3+ 7100	250 ppm (o) 100 ppm (t) 200 ppm (s)-(t)	1800 ppm	
<b>Isopropyl Amine</b> 75-31-0	2-aminopropane, monoisopropylamine, 2-propylamine, sec-propylamine	FF-OV	9001/2/3+ 7100	5 ppm (o) (t) 10 ppm (s)-(t)	750 ppm	
<b>Isopropyl Ether</b> 108-20-3	Diisopropyl Ether	OV	7100 8100	500 ppm (o); 250 ppm (t); 310 ppm (s)-(t)	1,400 ppm; [10% Lower explosion limit]	

## -K-

<b>Kaolin</b> 1332-58-7	China Clay; Aluminum Silicate	N	EZ22/EZ23N95 2200/2300N95 2600/2800N95	Total dust 15 mg/m <sup>3</sup> (o); Respirable fraction 5 mg/m <sup>3</sup> (o), 2 mg/m <sup>3</sup> (t)		t-A4, Particulate containing no Asbestos and <1% Crystalline Silica. Does not include stearates of toxic metals
<b>Kerosene</b> 8008-20-6		OV/RP	7100+ 8970/7940 8100+ 8970/8940	200 ppm as total Hydrocarbon vapor -skin-		t-A3, avoid prolonged and repeated skin contact

## -L-

<b>Lacquer Thinner</b>	(See Specific Ingredients)					
<b>Lead, Metal* &amp; Inorganic Compounds (Dust and Fume)</b> 7439-92-1		NRP100	2730N100 2360P100 7940/7990 8940/8990	0.05 mg/m <sup>3</sup> (o)(t)	100mg/m <sup>3</sup> (as Pb)	See 29CFR1910.1025 t-A3, Substance for which an ACGIH BEI exists; 29CFR1910.62 Construction standard
<b>Lead Chromate</b> 7758-97-6	Chrome Orange, Red Lead Chromate	NRP100	2730N100 2360P100 7940/7990 8940/8990	0.05mg/m <sup>3</sup> (t) as Pb; 0.012mg/m <sup>3</sup> (t) as Cr		t-A2; substance for which ACGIH BEI exists
<b>Lead Phosphate</b> 7446-27-7	(See 29CFR1910.1025)					
<b>Limestone</b> 1317-65-3	Calcium Carbonate	N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	Total dust 15 mg/m <sup>3</sup> (o), 10 mg/m <sup>3</sup> (t); Respirable fraction 5 mg/m <sup>3</sup> (o)		Particulates containing no Asbestos and <1% Crystalline Silica, t-A3
<b>Lindane</b> 58-89-9	Hexachlorocyclohexane	OV/NRP100 R95/P100	7100+ 8970/7940 8100+8940 +8970/8940	0.5 mg/m <sup>3</sup> (o)(t); -skin-	50 mg/m <sup>3</sup>	t-A3
<b>Lithium Hydride</b> 7580-67-8		N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	0.025 mg/m <sup>3</sup> (o)(t)	0.5 mg/m <sup>3</sup>	

## -M-

<b>Magnesite</b> 546-93-0	Magnesium Carbonate	N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	Total dust 10 mg/m <sup>3</sup> (t) 15 mg/m <sup>3</sup> (o); Respirable fraction 5 mg/m <sup>3</sup> (o)		Particulate containing no Asbestos and <1% Crystalline Silica
<b>Magnesium Oxide Fume</b> 1309-48-4	Magnesia Fume	N	2310/2315N99	15 mg/m <sup>3</sup> (o) 10 mg/m <sup>3</sup> (t)	750 mg/m <sup>3</sup>	
<b>Malathion</b> 121-75-5		OV/RP	7100+ 8970/7940 8100+ 8970/8940	Total dust 15 mg/m <sup>3</sup> (o), 1 mg/m <sup>3</sup> (t)*; -skin-	250 mg/m <sup>3</sup>	Substance for which an ACGIH BEI exists, t-A4; *inhalable vapor/aerosol
<b>Manganese; Dust &amp; Inorganic Compounds (as Mn)</b> *7439-96-5		N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	5 mg/m <sup>3</sup> (c)-(o); 0.2 mg/m <sup>3</sup> (t)	500 mg/m <sup>3</sup> (as Mn)	ACGIH NIC to .03mg/m <sup>3</sup> respirable fraction

Chemical – CAS#	Synonyms	Filter Type	Moldex Suggested	TLV(t) PEL(o)	IDLH	Comments
<b>Manganese, Metal Fume (as Mn)</b> 7439-96-5		N	2310/2315N99 2400/2800N95	0.2 mg/m <sup>3</sup> (t); 5 mg/m <sup>3</sup> (c)-(o)	500 mg/m <sup>3</sup> (as Mn)	
<b>Marble</b>	(See Calcium Carbonate)					
<b>Mercury Inorganic Compounds (as Hg) (except Alkyls)</b> 7439-97-6		N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	0.025 mg/m <sup>3</sup> (t); 0.1 mg/m <sup>3</sup> (c)-(o); -skin-	10 mg/m <sup>3</sup>	For dust with no vapor pressure; t-A4
<b>Mercury, Aryl Compounds (as Hg)</b>		N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	0.1 mg/m <sup>3</sup> (t); 0.1 mg/m <sup>3</sup> (c)-(o); -skin-		For dust with no vapor pressure; Substance for which ACGIH BEI exists
<b>Mesityl Oxide</b> 141-79-7	Isobutenyl methyl ketone, Isopropylideneacetone, Methyl isobutenyl ketone, 4-Methyl-3-penten-2-one	FF-OV	9001/2/3+ 7100	15 ppm (t) 25 ppm (o) 25 ppm (s)-(t)	1400 ppm [10% LEL]	
<b>Methanethiol</b> 74-93-1	(See Methyl Mercaptan)					
<b>2-Methoxyethanol</b> 109-86-4	Ethylene Glycol Monomethyl Ether; Methyl Cellosolve®	OV	7100 8100	0.1 ppm (t); 25 ppm (o); -skin-	200 ppm	Substance for which ACGIH BEI exists
<b>2-Methoxyethyl Acetate</b> 110-49-6	Ethylene Glycol Methyl Ether Acetate; Ethylene Glycol Monomethyl Ether Acetate; Methyl Cellosolve Acetate®	OV	7100 8100	0.1 ppm (t); 25 ppm (o); -skin-	200 ppm	Substance for which ACGIH BEI exists
<b>4-Methoxyphenol</b> 150-76-5	p-Methoxyphenol; Hydroquinone Monomethyl Ether	N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	5 mg/m <sup>3</sup> (t)		
<b>Methyl Acetate</b> 79-20-9	Methyl Ester of Acetic Acid; Methyl Acetic Ester; Methyl Ethanoate	OV	7100 8100	200 ppm (o)(t); 250 ppm (s)-(t)	3100 ppm [10% Lower explosion limit]	
<b>Methyl Acrylate</b> 96-33-3	Methoxycarbonylethylene, Methyl ester of acrylic acid, Methyl propenoate	FF-OV	9001/2/3+ 7100	2 ppm (t) 10 ppm (o) -skin-; SEN-	250 ppm	t-A4
<b>Methylamine</b> 74-89-5	Monomethylamine	AM	7400 8400	10 ppm (o), 5 ppm (t); 15 ppm (s)-(t)	100 ppm	Must use goggles for half mask
<b>Methyl Cellosolve®</b> 109-86-4	(See 2-Methoxyethanol)					
<b>Methyl Cellosolve Acetate®</b> 110-49-6	(See 2-Methoxyethyl Acetate)					
<b>Methyl Chloroform</b> 71-55-6	1,1,1-Trichloroethane	OV	7100 8100	350 ppm (t)(o)	700 ppm	ACGIHBEI exists
<b>o-Methylcyclohexanone</b> 583-60-8	2-Methylcyclohexanone	FF-OV	9001/2/3+ 7100	50 ppm (t) 75 ppm (s)-(t) 100 ppm (o) -skin-	600 ppm	
<b>2-Methylcyclopentadienyl Manganese Tricarbonyl</b> 12108-13-3		OV/N	7100+8910 8100+8910	0.2 mg/m <sup>3</sup> (t); -skin-		If heat involved, use supplied air
<b>4,4-Methylenedianiline</b> 101-77-9	4,4-Diaminodiphenylmethane; MDA	NRP100	2730N100 2360P100 7940/7990 8940/7990	0.01 ppm (o); 0.1 ppm (t); 0.1 ppm (s)-(o); -skin-		Need OV/NRP100 if heat is involved. See 29 CFR 1910.1050; O-Ca; t-A3
<b>Methyl Ethyl Ketone</b> 78-93-3	see 2-Butanone					
<b>Methyl Isoamyl Ketone</b> 110-12-3	Isoamyl methyl ketone, Isopentyl methyl ketone, 2-methyl-5-hexanone, 5-Methyl-2-hexanone, methyl-2-Hexanone, MIAK	FF-OV	9001/2/3+ 7100	50 ppm (t) 100 ppm (o)	N.D.	
<b>Methyl Isobutyl Carbinol</b> 108-11-2	Methyl Amyl Alcohol	OV	7100 8100	25 ppm (o)(t); 40 ppm (s)-(t); -skin-	400 ppm	
<b>Methyl Isobutyl Ketone</b> 108-10-1	see Hexanone	FF-OV				

Chemical – CAS#	Synonyms	Filter Type	Moldex Suggested	TLV(t) PEL(o)	IDLH	Comments
<b>Methyl Isopropyl Ketone</b> 563-80-4	2-Acetyl propane, Isopropyl methyl ketone, 3-Methyl-2-butanone, 3-Methyl butan-2-one, MIPK	FF-OV	9001/2/3+ 7100	200 ppm (t)	N.D.	
<b>Methyl (n-amyl) Ketone</b> 110-43-0	n-Amyl Methyl Ketone; 2-Heptanone	OV	7100 8100	100 ppm (o); 50 ppm (t)	800 ppm	Add 8940 if Particulate is present
<b>Methyl Mercaptan</b> 74-93-1	Methanethiol	OV	7100 8100	0.5 ppm (t); 10 ppm (c)-(o)	150 ppm	Very short service life
<b>Methyl Methacrylate</b> 80-62-6	Methacrylic Acid; Methyl Ester	OV	7100 8100	100 ppm (o) 50 ppm (t) 100 ppm (s)(t)	1,000 ppm	t-A4; SEN
<b>Methyl Parathion</b> 290-00-0		OV/P100	7100+7940 8100+8940	0.2 mg/m <sup>3</sup> (t); -skin-		Substance for which an ACGIH BEI exists; t-A4
<b>Methyl Propyl Ketone</b> 107-87-9	see 2-Pentanone	FF-OV				
<b>a-Methyl Styrene</b> 98-83-9	1-Methyl-1-Phenyl-Ethylene; AMS; 2 Phenylpropylene; Isopropenyl Benzene	OV	7100 8100	50 ppm (t); 100 ppm (s)-(t); 100 ppm (c)-(o)	700 ppm	Add 8970 or 8940 if Particulate is present ACGIH NiC to 20ppm & T-A3
<b>Mica (less than 1% quartz)</b> 12001-26-2		N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	20 mppcf (o);** 3 mg/m <sup>3</sup> (t)*	1,500 mg/m <sup>3</sup>	Does not include strearates of toxic metals; *Respirable; Particulate containing no Asbestos and <1% Crystalline Silica ** <1% Silica
<b>Mineral Spirits</b>	(See Stoddard Solvent)					
<b>Mineral (Rock), Wool Fiber</b>	(See Fibrous Glass)					
<b>Molybdenum - Soluble Compounds – Inorganics only (as Mo)</b> 7439-98-7		N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	5 mg/m <sup>3</sup> (o) 5 mg/m <sup>3</sup> (t)* {water soluble}	1,000 mg/m <sup>3</sup> (as Mo)	*Respirable fraction; t-A3
<b>Molybdenum - Insoluble Compounds and Metal Dust – Inorganics only (as Mo)</b> 7439-98-7		N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	10 mg/m <sup>3</sup> (t)** 15 mg/m <sup>3</sup> (o)* 3 mg/m <sup>3</sup> (t) <sup>Ⓔ</sup>	5,000 mg/m <sup>3</sup> (as Mo)	*Total dust; *respirable fraction and **inhalable fraction
<b>Molybdenum, Metal Fume</b> 7439-98-7		N	2310/2315N99 2400/2800N95	10 mg/m <sup>3</sup> (t)** 15 mg/m <sup>3</sup> (o)* 3 mg/m <sup>3</sup> (t) <sup>Ⓔ</sup>	5,000 mg/m <sup>3</sup> (as Mo)	*Total dust *respirable fraction; **inhalable fraction
<b>Monochlorobenzene</b> 108-90-7	(See Chlorobenzene)					
<b>Morpholine</b> 110-91-8	Diethylene imidoxide; Diethylene oximide, Tetrahydro-1,4-oxazine; Tetrahydro-p-oxazine	FF-OV	9001/2/3+ 7100	20 ppm (o) (t) -skin-	1400 ppm [10% LEL]	t-A4
<b>Muriatic Acid</b> 7647-01-0	(See Hydrogen Chloride)					
<b>-N-</b>						
<b>Naphtha (Coal tar)</b> 8030-30-6	crude solvent coal tar naptha, High solvent naptha, Naptha, Rubber solvent	FF-OV	9001/2/3+ 7100	100 ppm (o)	1000 ppm [10% LEL]	
<b>Napthalene</b> 91-20-3	White Tar; Naphthalin	OV/N	7100+8910 8100+8910	10 ppm (o)(t); 15 ppm (s)-(t) -skin-	250 ppm	t-A4
<b>a-Naphthylamine</b> 134-32-7	1-Naphthylamine					See 29CFR1910.1003 and 1004; O-Ca
<b>b-Naphthylamine</b> 91-59-8	2-Naphthylamine					See 29CFR1910.1003, and 1004; t-A1; O-Ca
<b>Nickel, Soluble Compounds (as Ni)</b>		N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	0.1 mg/m <sup>3</sup> (t)* 1 mg/m <sup>3</sup> (o)	10 mg/m <sup>3</sup> (as Ni)	*Inhalable fraction, t-A4
<b>Nickel, Insoluble Compounds (as Ni)</b>		N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	1.0 mg/m <sup>3</sup> (o), .2 mg/m <sup>3</sup> (t)*	10 mg/m <sup>3</sup> (as Ni)	*Inhalable fraction, t-A1

Chemical – CAS#	Synonyms	Filter Type	Moldex Suggested	TLV(t) PEL(o)	IDLH	Comments
<b>Nickel, Metal</b> 7440-02-0		N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	1 mg/m <sup>3</sup> (o), 1.5 mg/m <sup>3</sup> (t)*	10mg/m <sup>3</sup> (as Ni)	*Inhalable fraction, t-A5
<b>Nickel, Metal Fumes (as Ni)</b> 7440-02-0		N	2310/2315N99 2400/2800N95	1 mg/m <sup>3</sup> (o) 1.5 mg/m <sup>3</sup> (t)*	10 mg/m <sup>3</sup> (as Ni)	*Inhalable fraction, t-A5
<b>Nicotine</b> 54-11-5	3-(1-Methyl-2-Pyrrolidyl) Pyridine	OV/RP	7100+8970/7940 8100+8970/8940	0.5 mg/m <sup>3</sup> (o)(t); -skin-	5 mg/m <sup>3</sup>	
<b>p-Nitroaniline</b> 100-01-6	Azoic diazo component 37; p-Aminonitro-benzene; Fast Red GG. base; 4-Nitroaniline; PNA	OV/N	7100+8910 8100+8910	3 mg/m <sup>3</sup> (t); -skin- 6 mg/m <sup>3</sup> (o)	300mg/m <sup>3</sup>	Substance for which an ACGIH BEI exists t-A4
<b>Nitrobenzene</b> 98-95-3	Nitrobenzol; Oil of Mirbane	OV	7100 8100	1 ppm (o)(t); -skin-	200 ppm	Substance for which an ACGIH BEI exists t-A3
<b>Nitroethane</b> 79-24-3	Nitroetan	FF-OV	9001/2/3+ 7100	100 ppm (o) (t)	1000 ppm	
<b>Nitromethane</b> 75-52-5	Nitrocarbol	OV	7100 8100	20 ppm (t) 50 ppm (o)	750ppm	
<b>1-Nitropropane</b> 108-03-2	Nitropropane	OV	7100 8100	25 ppm (t)(o)	1000ppm	
<b>2-Nitropropane</b> 79-46-9	Dimethylnitromethane; sec-Nitropropane	OV	7100 8100	10 ppm (t) 25 ppm (o)	100ppm	
<b>Nitroluene (o*, mt, p<sup>A</sup>)</b> *88-72-2 †99-08-1 ‡99-99-0		OV/N	7100+8910 8100+8910	2 ppm (t); -skin- 5 ppm (o)	200 ppm	Substance for which an ACGIH BEI (Methemoglobin inducer) exists
<b>Nonane</b> 111-84-2	n-Nonane	OV	7100 8100	200 ppm (t)		
<b>Nuisance particulates</b>	See (Particulates not otherwise classified)					
<b>-O-</b>						
<b>Octachloronaphthalene</b> 2234-13-1	Halowax 1051	OV/N	7100+8910 8100+8910	0.1 mg/m <sup>3</sup> (o)(t); 0.3 mg/m <sup>3</sup> (s)-(t); -skin-	1mg/m <sup>3</sup> *	Add 8910 if particulate is present. *NIOSH set "Effective" IDLH at 10x the Recommended Exposure Limit (REL)
<b>Octane</b>	Normal Octane	OV	7100 8100	500 ppm (o)* 300 ppm (t);	1,000 ppm; [10% Lower explosion limit]	*n-Octane only
<b>Oil Mist (Mineral);</b>	White Mineral Oil; Cutting Oil; Heat-Treating Oil; Hydraulic Oil; Cable Oil; Lubricating Oil	RP	2740R95/8970 7940/7990 8940/8990	5 mg/m <sup>3</sup> (o)(t)*; 10 mg/m <sup>3</sup> (s)(t)	2,500 mg/m <sup>3</sup>	*Measured as inhalable fraction and vapor
<b>Oxalic Acid</b> 144-62-7	Oxalic Acid Dihydrate; Ethane Dioic Acid	OV/N	7100+8910 8100+8910	1 mg/m <sup>3</sup> (o)(t); 2 mg/m <sup>3</sup> (s)-(t)	500 mg/m <sup>3</sup>	
<b>-P-</b>						
<b>Paraffin Wax Fume</b> 8002-74-2		RP	2740R95/ 2360P100/8970 7940/7990 8940/8990	2 mg/m <sup>3</sup>		
<b>Paraquat Dichloride</b> 1910-42-5		OV/NRP	7100+8910/ 8970/7940 8100+8910/ 8970/8940		1 mg/m <sup>3</sup> (t)	
<b>Parathion</b> 56-38-2		OV/P100	7100+7940 8100+8940	0.1 mg/m <sup>3</sup> (o); -skin- -05 mg/m <sup>3</sup> (t)* -skin-	10 mg/m <sup>3</sup>	Substance for which an ACGIH BEI exists; t-A4; *Measured as inhalable fraction and vapor

Chemical – CAS#	Synonyms	Filter Type	Moldex Suggested	TLV(t) PEL(o)	IDLH	Comments
<b>Particulates Not Otherwise Classified (PNOC)</b>		NRP	See note**	Total dust 15 mg/m <sup>3</sup> (o) or 50mppcf(o); Respirable fraction; 5 mg/m <sup>3</sup> (o) or 15mppcf(o);		**Caution is advised category includes many materials, R or P filter is suggested if oils are present
<b>Pentachloronaphthalene</b> 1321-64-8	Halowax 1013	OV/N	7100+8910 8100+8910	0.5 mg/m <sup>3</sup> (o)(t); -skin-	5mg/m <sup>3</sup> *	*NIOSH set "Effective" IDLH at 10x the Recommended Exposure Limit (REL)
<b>Pentachlorophenol</b> 87-86-5		OV/N	7100+8910 8100+8910	0.5 mg/m <sup>3</sup> (o)(t); -skin-	2.5 mg/m <sup>3</sup>	Substance for which an ACGIH BEI exists t-A3
<b>Pentaerythritol</b> 115-77-5		N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	Total dust 10 mg/m <sup>3</sup> (t), 15mg/m <sup>3</sup> (o); Respirable fraction 5 mg/m <sup>3</sup> (o)		
<b>Pentane</b> 109-66-0	Normal Pentane	OV	7100 8100	600ppm (t) 100ppm	1500 ppm [10% Lower explosion limit]	
<b>2-Pentanone</b> 107-87-9	Methyl Propyl Ketone, MPK, Ethyl acetone	FF-OV	9001/2/3+ 7100	200 ppm (o) 150 ppm (s)-(t)	1500 ppm	
<b>Perchloroethylene</b>	see tetrachoroethylene					
<b>Perchloromethyl Mercaptan</b> 594-42-3	PMM; Trichloromethyl Sulfur Chloride	OV	7100 8100	0.1 ppm (o)(t)	10 ppm	
<b>Perlite</b> 93763-70-3	Sodium Potassium Aluminum Silicate	N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	Total Dust 15 mg/m <sup>3</sup> (o); Respirable fraction 5 mg/m <sup>3</sup> (o)		t-A4
<b>Petroleum Distillates (Naptha)</b> 8002-05-9	Petroleum Naptha; Aliphatic Petroleum Naptha; Rubber Solvent; Naphtha	OV	7100 8100	500 ppm (o)	1,100 ppm; [10% Lower explosion limit]	Odors vary. Must have good warning properties to use 8100. Specific TLV's apply
<b>Phenol</b> 108-95-2	Carbolic Acid; Monohydroxy Benzene	OV/N	7100+8910 8100+8910	5 ppm (o)(t); -skin-	250 ppm	Substance for which an ACGIH BEI exists; t-A4
<b>p-Phenylene Diamine</b> 106-50-3		OV/N	7100+8910 8100+8910	0.1 mg/m <sup>3</sup> (o)(t); -skin-	25 mg/m <sup>3</sup>	Use supplied air if heat is involved; t-A4
<b>Phenyl Ether, Vapor</b> 101-84-8	Diphenyl Ether; Diphenyl Oxide	OV/N	7100+8910 8100+8910	1 ppm (o)(t); 2 ppm (s)(t)	100 ppm	
<b>Phenyl Ether - Biphenyl Mixture; Vapor</b> 8004-13-5	Dowtherm™ A, Diphenyl Oxide - Diphenyl Mixture	OV/N	7100+8910 8100+8910	1 ppm (o)	10ppm	Add 8910 if Particulate is present
<b>Phenyl Mercaptan</b> 108-98-5	Benzenethiol; Thiophenol	OV	7100 8100	0.1 ppm (t) Skin		
<b>Phenylethylene</b> 108-42-5	(see Styrene Monomer)					
<b>Phosphoric Acid</b> 7664-38-2	Orthophosphoric acid, Phosphoric acid (aqueous), White phosphoric acid	FF-N95	9001/2/3+ 7940/7990	1 mg/m <sup>3</sup> (o)(t) 3 mg/m <sup>3</sup> (s)-(t)	1000 mg/m <sup>3</sup>	
<b>Phosphorus Pentasulfide</b> 1314-80-3	Phosphoric Chloride	N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	1 mg/m <sup>3</sup> (o)(t); 3 mg/m <sup>3</sup> (s)-(t)	250 mg/m <sup>3</sup>	
<b>Phthalic Anhydride</b> 85-44-9	Phosphoric Sulfide	OV/N	7100+8910 8100+8910	1 ppm (t) 2ppm (o)	10 ppm	t-A4; SEN
<b>m-Phthalodinitrile</b> 626-17-5	Isophthalodinitrile; IPN; m-Dicyanobenzene	N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	5 mg/m <sup>3</sup> (t)*		*Measured as inhalable fraction and vapor
<b>Picric Acid</b> 88-89-1	2,4,6,-Trinitrophenol	N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	0.1 mg/m <sup>3</sup> (o)(t); -skin-	75 mg/m <sup>3</sup>	
<b>Pindone</b> 83-26-1	Tert-Butylvalone, mist 1,3-Dioxo-2-Pivaloy-Lindane	N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	0.1 mg/m <sup>3</sup> (o)(t)	100 mg/m <sup>3</sup>	

Chemical – CAS#	Synonyms	Filter Type	Moldex Suggested	TLV(t) PEL(o)	IDLH	Comments
<b>Piperazine Dihydrochloride</b> 142-64-3	Dihydrochloride Salt of Diethylenediamine	N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	5 mg/m <sup>3</sup> (t)		
<b>Plaster of Paris</b> 26499-65-0	Calcium Sulfate	N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	Total dust 10 mg/m <sup>3</sup> (t)* 15 mg/m <sup>3</sup> (o); Respirable fraction 5 mg/m <sup>3</sup> (o)		Total dust containing no Asbestos and <1% Crystalline Silica measured as inhalable fraction of aerosol
<b>Platinum Metal, Dusts and Mists</b> 7440-06-4		N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	1 mg/m <sup>3</sup> (t) {water-based}		
<b>Platinum Soluble Salts</b> 7440-06-4	Synonyms vary depending upon the specific soluble platinum salt	FF-N95	9001/2/3+ 7940/7990	.002 mg/m <sup>3</sup> (o)(t)	4 mg/m <sup>3</sup> (as PT)	
<b>Portland Cement</b> 65997-15-1	Hydraulic Cement; Cement; Portland Cement Silicate	N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	Total dust 1 mg/m <sup>3</sup> (t) 15mg/m <sup>3</sup> (o) or 50mppcf (o); Respirable fraction 5 mg/m <sup>3</sup> (o)	5,000 mg/m <sup>3</sup>	Particulate matter containing no Asbestos and <1% Crystalline Silica t-A4
<b>Potassium Hydroxide</b> 1310-58-3	Caustic Potash; Lye; Potassium Hydrate	N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	2 mg/m <sup>3</sup> (c)-(t)		
<b>Propargyl Alcohol</b> 107-19-7	2-Propyl-1-01	OV	7100 8100	1ppm (t) -skin-		
<b>Propionic Acid</b> 79-09-4	Carboxyethane, Ethanecarboxylic acid, Ethylformic acid, Metacetic acid, Methyl acetic acid, Propanoic acid	FF-OV	9001/2/3+ 7100	10 ppm (t)	N.D.	
<b>n-Propyl Acetate</b> 109-60-4	Propylacetate, n-Propyl ester of acetic acid	FF-OV	9001/2/3+ 7100	200 ppm (o)(t) 250 ppm (s)-(t)	1700 ppm	
<b>n-Propyl Alcohol</b> 71-223-8	1-propanol, n-propanol, propanol, Ethyl carbinol	FF-OV	9001/2/3+ 7100	100 ppm (t) 200 ppm (o)	800 ppm	Add particulate prefilter if particulate is present t-A4
<b>Propylene Dichloride</b> 78-87-5	1,2-Dichloropropane	OV	7100 8100	10 ppm (t); 75ppm (0)	400 ppm -SEN-	t-A4
<b>Propylene Glycol Monomethyl Ether</b> 107-98-2	1-Methoxy-2-Propanol	OV	7100 8100	100 ppm (t); 150 ppm (s)-(t)		
<b>Pyrethrum</b> 8003-34-7	Cinerin I or II; Jasmolin I or II; Pyrethrin I or II; Pyrethrum I or II [Pyrethrum is a variable mixture of Cenerin, Jasmolin and Pythrin]	OV/P100	7100+7940 8100+8940	5 mg/m <sup>3</sup> (o)(t)	5,000 mg/m <sup>3</sup>	t-A4
<b>Pyridine</b> 110-86-1	Azabenzene; Azine	OV	7100 8100	5 ppm (o)(t)	1,000 ppm	ACGIH NIC to 1 ppm & t-A3
<b>-Q-</b>						
<b>Quartz</b>	(See Silica, Crystalline)					
<b>Quinone</b> 106-51-4	Benzoquinone, 1,4-Benzoquinone; p-Benzoquinone, 1,4-Cyclohexadiene dioxide, p-Quinone	FF-OV/N95	9001/2/3+ 7100+8910	0.1 ppm (o)(t)	22 ppm	
<b>-R-</b>						
<b>Resorcinol</b> 108-46-3	m-Dihydroxybenzene; 1,3-Benzenediol	OV/N	7100+8910 8100+8910	10 ppm (t); 20 ppm (s)-(t)		t-A4
<b>Rhodium, Metal* and Insoluble Compounds, Dusts and Mists (as Rh)</b> *7440-16-6		N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	0.1 mg/m <sup>3</sup> (o); 1 mg/m <sup>3</sup> (t) {water-based}	100 mg/m <sup>3</sup> (as Rh)	t-A4
<b>Rhodium, Metal Fume (as Rh)</b> 7440-16-6		N	2310/2315N99 2400/2800N95	0.1 mg/m <sup>3</sup> (o) 1 mg/m <sup>3</sup> (t)	100 mg/m <sup>3</sup> (as Rh)	
<b>Rhodium, Soluble Compounds (as Rh)</b>		NRP100	2730N100 2360P100 7940/7990 8940/8990	0.001 mg/m <sup>3</sup> (o); 0.01 mg/m <sup>3</sup> (t)	2 mg/m <sup>3</sup> (as Rh)	t-A4

Chemical – CAS#	Synonyms	Filter Type	Moldex Suggested	TLV(t) PEL(o)	IDLH	Comments
<b>Ronnel</b> 299-84-3		OV/NRP100	7100+7940 8100+8940	5 mg/m <sup>3</sup> (t)* 15 mg/m <sup>3</sup> (o)	300 mg/m <sup>3</sup>	Substance for which ACGIH BEI exists, t-A4. *Measured as inhalable fraction and vapor
<b>Rotenone</b> 83-79-4		OV/NRP100	7100+7940 8100+88940	5 mg/m <sup>3</sup> (o)(t)	2,500 mg/m <sup>3</sup>	t-A4
<b>Rouge</b> 1309-37-1	Red Iron Oxide; Red Oxide; Blended Red Oxides; Iron (III) Oxide	N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	Total dust 15 mg/m <sup>3</sup> (o); Respirable fraction 5 mg/m <sup>3</sup> (o)		
<b>-S-</b>						
<b>Selenium* &amp; Compounds; Dusts &amp; Mists (except Hexafluoride) (as Se)</b> *7782-49-2		N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	0.2 mg/m <sup>3</sup> (o)(t)	1 mg/m <sup>3</sup> (as Se)	
<b>Silica-Amorphous, Diatomaceous Earth (Uncalcined)</b> 61790-53-2		N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	20 mppcf (o) or <u>80 mg/m<sup>3</sup> (o)</u> %SiO <sub>2</sub>	3000 mg/m <sup>3</sup>	
<b>Silica-Amorphous, Precipitated Silica and Silica Gel</b> *112926-00-8		N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	20 mppcf (o) or <u>80 mg/m<sup>3</sup> (o)</u> %SiO <sub>2</sub>	3000 mg/m <sup>3</sup>	
<b>Silica-Amorphous, Silica-Fused</b> 60676-86-0		N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	<u>30 mg/m<sup>3</sup> (o)**</u> %SiO <sub>2</sub> +2 or <u>250 mppcf (o)*</u> %SiO <sub>2</sub> +5 or <u>10 mg/m<sup>3</sup> (o)*</u> %SiO <sub>2</sub> +2	3000 mg/m <sup>3</sup>	**Total dust *Respirable dust
<b>Silica-Crystalline; Quartz*</b> *14808-60-7		N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	0.25 mg/m <sup>3</sup> (t)* quartz <u>10 mg/m<sup>3</sup> (o)*</u> %SiO <sub>2</sub> +2 or <u>250 mppcf (o)*</u> %SiO <sub>2</sub> +5 or <u>30 mg (o)/m<sup>3</sup>**</u> %SiO <sub>2</sub> +2	50 mg/m <sup>3</sup> (Crystalline quartz)	t-A2 *Respirable dust **Total dust
<b>Silica-Crystalline; Tripoli</b> 1317-95-9		N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	(o) use the value calculated from the formulas for quartz	50 mg/m <sup>3</sup>	
<b>Silica-Crystalline (Cristobalite* &amp; Tridymite<sup>Δ</sup>)</b> *14464-46-1 Δ15468-32-3		N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	(Cristobalite only) 0.025 mg/m <sup>3</sup> (t) (Respirable); (o)respirable fraction use 1/2 the value calculated from the formulas (applies to quartz for cristobalite & tridymite.)	25 mg/m <sup>3</sup>	t-A2
<b>Silicon</b> 7440-21-3		N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	15 mg/m <sup>3</sup> (o); total dust Respirable fraction 5 mg/m <sup>3</sup> (o)		
<b>Silicon Carbide</b> 409-21-2	Carbon Silicide; Carborundum; Silicon Monocarbide	N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	15 mg/m <sup>3</sup> (o); Respirable fraction 5 mg/m <sup>3</sup> (o)		t-A4
<b>Silver, Metal; Dust &amp; Fumes</b> 7440-22-4		N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	0.01 mg/m <sup>3</sup> (o); 0.1 mg/m <sup>3</sup> (t)	10 mg/m <sup>3</sup> (as Ag)	
<b>Silver, Soluble Compounds (as Ag)</b>		N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	0.01 mg/m <sup>3</sup> (o)(t) {water based}	10 mg/m <sup>3</sup> (as Ag)	
<b>Soapstone</b>	Massive Talc; Steatite; Soapstone Silicate	N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	Total dust 20 mppcf (o); Respirable fraction 3 mg/m <sup>3</sup> (t) 6 mg/m <sup>3</sup> (t) inhalable	3,000 mg/m <sup>3</sup>	Total dust containing no Asbestos and <1% Crystalline Silica

Chemical – CAS#	Synonyms	Filter Type	Moldex Suggested	TLV(t) PEL(o)	IDLH	Comments
<b>Sodium Aluminum Fluoride</b> 15096-52-3	Cryocide, Cryodust, Cryolite Sodium Hexafluoroaluminate	N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	2.5 mg/m <sup>3</sup> (o)(t)	250 mg/m <sup>3</sup> (as F)	t-A4
<b>Sodium Bisulfite</b> 7631-90-5	Sodium Hydrogen Sulfite	AG/N	7200+8910 8200+8910	5 mg/m <sup>3</sup> (t)		t-A4
<b>Sodium Fluoroacetate</b> 62-74-8	Sodium Monofluoroacetate; SFA	N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	0.05 mg/m <sup>3</sup> (o)(t); -skin-	2.5 mg/m <sup>3</sup>	
<b>Sodium Flouride</b> 7681-49-4	Floridine, Sodium Monofluoride	N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	2.5 mg/m <sup>3</sup> (o)(t)	250 mg/m <sup>3</sup> (as F)	t-A4
<b>Sodium Hydroxide</b> 1310-73-2	Caustic Soda; Soda Lye; Lye	N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	2 mg/m <sup>3</sup> (o); 2 mg/m <sup>3</sup> (c)-(t)	10 mg/m <sup>3</sup>	
<b>Sodium Metabisulfite</b> 7681-57-4	Sodium Pyrosulfite	AG/N	8200+8910	5 mg/m <sup>3</sup> (t)		t-A4
<b>Starch</b> 9005-25-8	Corn Starch	N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	Total dust 10 mg/m <sup>3</sup> (t), 15 mg/m <sup>3</sup> (o); Respirable fraction 5 mg/m <sup>3</sup> (o)		t-A4
<b>Stoddard Solvent</b> 8052-41-3	Dry Cleaning Safety Solvent; Mineral Spirits	OV	7100 8100	100 ppm (t) 500 ppm (o)	20,000 mg/m <sup>3</sup>	
<b>Strychnine</b> 57-24-9		N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	0.15 mg/m <sup>3</sup> (o)(t)	3 mg/m <sup>3</sup>	
<b>Styrene, Monomer</b> 100-42-5	Phenylethylene; Vinyl Benzene; Cinnamene; Styrene Bonomer	OV	7100 8100	20 ppm (t)*; 100 ppm -(o); - 40 ppm (s)-(t) 200 ppm (c)-(o) [600 ppm (c)-(o); 5 min peak / any 3 hrs]	700 ppm	*Substance for which an ACGIH BEI exists; A-4
<b>Sucrose</b> 57-50-1	Table Sugar; Saccharose	N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	Total dust 10 mg/m <sup>3</sup> (t), 15 mg/m <sup>3</sup> (o); Respirable fraction 5 mg/m <sup>3</sup> (o)		t-A4
<b>Sulfur Dioxide</b> 7446-09-5		AG	7200 8200	5 ppm (o); 2 ppm (t); 5 ppm (s)-(t)	100 ppm	t-A4; ACGIH NIC to 0.25 (c)
<b>Sulfuric Acid</b> 7664-93-9	Oil of vitriol	AG/N	7200+8910 8200+8910	1 mg/m <sup>3</sup> (o)(t); 0.2* (t)	15 mg/m <sup>3</sup>	Must use appropriate eye protection, t-A2 for Sulfuric Acids contained in strong inorganic acid mists *Measured as Thoracic fraction of aerosol
<b>Sulfur Monochloride</b> 10025-67-9	Sulfur chloride, Sulfur subchloride, Thiosulfurous dichloride	FF-AG	9001/2/3+ 7200/7300/ 7600	1 ppm(c)-(t) 1 ppm (o)	5 ppm	
<b>-T-</b>						
<b>2,4,5-T</b> 93-76-5	2,4,5-Trichlorophenoxy Acetic Acid	N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	10 mg/m <sup>3</sup> (o)(t)	250 mg/m <sup>3</sup>	t-A4
<b>Talc; (Containing no Asbestos Fibers)</b> 14807-96-6	Non-Asbestiform Talc; Hydrous Magnesium Silicate; Steatite Talc; Non-Fibrous Falc	N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	Respirable dust* 2 mg/m <sup>3</sup> (t); 20mppcf (o) [containing <1% quartz]	1,000 mg/m <sup>3</sup>	*Particulate containing no Asbestos and <1% Crystalline Silica, t-A4
<b>Talc (Containing Asbestos Fibers)</b>	(Use Asbestos recs. and see 29CFR1910.1001)					
<b>Tantalum, Metal &amp; Oxide Dusts (as Ta)</b> 7440-25-7 (metal)		N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	5 mg/m <sup>3</sup> (o)(t)	2,500 mg/m <sup>3</sup> (as Ta)	
<b>Tellurium* &amp; Compounds, Dusts &amp; Mists (Except Hexafluoride) (as Te)</b> *13494-80-9		N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	0.1 mg/m <sup>3</sup> (o)(t)* {water based mists}	25 mg/m <sup>3</sup>	*Except Hydrogen Telluride

Chemical – CAS#	Synonyms	Filter Type	Moldex Suggested	TLV(t) PEL(o)	IDLH	Comments
<b>Terphenyls</b> 26140-60-3	o-Terphenyl; m-Terphenyl; p-Terphenyl; Mixed Terphenyls; Diphenyl Benzenes	N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	5 mg/m <sup>3</sup> (c)(t) 9 mg/m <sup>3</sup> (c)(o)	500 mg/m <sup>3</sup>	OV w/ particulate filter may be suggested if heat is involved
<b>1,1,2,2-Tetrabromoethane</b> 79-27-6	Acetylene tetrabromide, Muthmann's liquid, tetrabromoethane, Tetrabromoethylene		7100 8100	1.4ppm (t)* 1ppm (o)	8ppm	Measured as inhalable fraction and vapors
<b>1,1,2,2 Tetrachloroethane</b> 79-34-5		OV	7100 8100	1 ppm (t) 5 ppm (o) -skin-	100ppm	t-A3
<b>Tetrachloroethylene</b> 127-18-4	perchloroethylene, perchloroethylene, perk	FF-OV	9001/2/3+ 7100	25 ppm (t) 100 ppm (s)-(t) 100 ppm (o) 200 ppm (c) 300 ppm 5 min peak in any 3 hrs	150 ppm	Substance for which ACGIH BEI exists
<b>Tetrachloronaphthelene</b> 1335-88-2		OV/N	7100+8910 8100+8910	2 mg/m <sup>3</sup> (o)(t) skin	50 mg/m <sup>3</sup>	
<b>Tetrahydrofuran</b> 109-99-9	Diethylene Oxide; Tetramethylene Oxide; THF	OV	7100 8100	50 ppm (t); 200 ppm (s)-(t) 200 ppm (o)	2,000 ppm (10% lower explosion limit)	t-A3
<b>Tetryl</b> 479-45-8	2,4,6-Trinitrophenyl-Methylnitramine; N-Methyl-N-2,4,6-Tetra-Nitroaniline; Nitramine	N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	1.5 mg/m <sup>3</sup> (o)(t); -skin-	750 mg/m <sup>3</sup>	
<b>Thallium; Elemental and Soluble Compounds (as Ti)</b> *7440-28-0	Thallium acetate; Thallium Carbonate; Thallium Hydroxide; etc.	N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	0.1 mg/m <sup>3</sup> (o); 0.02 mg/m <sup>3</sup> (t)* -skin-	15 mg/m <sup>3</sup> (as Ti)	Measured as inhalable fraction and vapors
<b>4, 4'-Thiobis (6 Tert-Butyl-m-Cresol)</b> 96-69-5	4,4' -Thiobis (3-Methyl-6-Tert-Butylphenol)	N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	Total dust 10 mg/m <sup>3</sup> (t), 15 mg/m <sup>3</sup> (o); Respirable fraction 5mg/m <sup>3</sup>		t-A4
<b>Thiram</b> 137-26-8		OV/NRP100	7100+7940 8100+8940	5 mg/m <sup>3</sup> (o); 1 mg/m <sup>3</sup> (t)	100 mg/m <sup>3</sup>	ACGIH NIC to 0.05 mg/m <sup>3</sup> measured as inhalable fraction and vapors & SEN.
<b>Tin, Inorganic Compounds (Except SnH<sub>4</sub>) and Metal Oxides (as Sn), Dusts &amp; Mists</b>		N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	2 mg/m <sup>3</sup> (o)* 2 mg/m <sup>3</sup> (t) {water based mists}	100 mg/m <sup>3</sup> (as Sn) except for Tin (II) and Tin (IV)	*inorganic compound except oxides
<b>Tin, Inorganic Compounds, Fume</b>		N	2310/2315N99 2400/2800N95	2 mg/m <sup>3</sup> (o)* 2 mg/m <sup>3</sup> (t)		*inorganic compound except oxides
<b>Tin, Organic Compounds (as Sn)</b>		OV/N	7100+8910 8100+8910	0.1 mg/m <sup>3</sup> (o)(t); 0.2 mg/m <sup>3</sup> (s)-(t); -skin-	25 mg/m <sup>3</sup>	t-A4
<b>Titanium Dioxide</b> 13463-67-7	Rutile; Anatase; Brookite	N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	10 mg/m <sup>3</sup> (t) 15 mg/m <sup>3</sup> (o)*	5000 mg/m <sup>3</sup>	*total dust, t-A4
<b>Toluene</b> 108-88-3	Toluol; Phenyl Methane; Methyl Benzene	OV	7100 8100	20 ppm (t); 200 ppm (o); 300 ppm (c)-(o); [500 ppm 10 min peak per 8 hr shift (c)(o)]; -skin-	500 ppm	t-A4 substance for which an ACGIH BEI exists
<b>Tributyl Phosphate</b> 126-73-8	Tri-n-Butyl Phosphate; TBP	OV/RP	7100+8970/7940 8100+8970/8940	2.2 mg/m <sup>3</sup> (t) 5 mg/m <sup>3</sup> (o)	30 ppm	Substance for which an ACGIH (Acetylcholinesterase Inhibiting Pesticide) BEI exists
<b>Trichloroacetic Acid</b> 76-03-9	TCA	OV/AG	7300 8300	1 ppm (t)		t-A3
<b>1,2,4-Trichlorobenzene</b> 120-82-1		OV	7100 8100	5 ppm (c)-(t)		
<b>Trichloroethylene</b> 79-01-6		OV	7100 8100	10ppm (t); 100ppm (o); 1000ppm 200ppm (c)-(o) [300 ppm 5 min peak in any 2 hrs] 25ppm (c)-(t)		substance for which an ACGIH BEI exists t-A2

Chemical – CAS#	Synonyms	Filter Type	Moldex Suggested	TLV(t) PEL(o)	IDLH	Comments
<b>Trichloronaphthalene</b> 1321-65-9	Hallowax; Seekay Wax; Nibren Wax	OV/N	7100+8910 8100+8910	5 mg/m <sup>3</sup> (o)(t); -skin-	20mg/m <sup>3</sup>	Use 8940 when particulate is present
<b>Tridymite</b>	(See Silica Crystalline)					
<b>Triethylamine</b> 121-44-8	TEA	FF-OV	9001/2/3+ 7100	1 ppm (t) 2 ppm (s)-(t) 25 ppm (o) -skin-	200 ppm	t-A4
<b>Trimellitic Anhydride</b> 552-30-7	TMA	OV/N	7100+8910 8100+8910	0.04 mg/m <sup>3</sup> (c)-(t)		ACGIH NIC to 0.0005mg/m <sup>3</sup> Measured as inhalable fraction and vapors & 0.002 mg/m <sup>3</sup> (c) Measured as inhalable fraction and vapors
<b>Trimethylamine</b> 75-50-3	N,N-Dimethylmethanamine; TMA [Note: May be used in an aqueous solution (typically 25%, 30%, or 40% TMA.)]	FF-AM	9001/2/3+ 7400/7600	5ppm (t)	N.D.	
<b>Trimethyl Benzene*</b> 95-63-6; 108-67-8; 526-73-8	Mesitylene; Pseudocumene; Hemimellitene	OV/P100	7100+7940 8100+8940	25* ppm (t)		*All isomers and mixed isomers
<b>Trimethylphosphite</b> 121-45-9	Methyl phosphite, Trimethoxyphosphine, Trimethyl ester of phosphorous acid	FF-OV	9001/2/3+ 7100	2 ppm (t)	N.D.	
<b>2,4,6-Trinitrophenol</b> 88-89-1	(See Picric Acid)					
<b>2,4,6-Trinitrophenylmethyl-Nitramine</b> 479-45-8	(See Tetryl)					
<b>2,4,6-Trinitrotoluene</b> 118-96-7	TNT; Trinitrotoluol	OV/N	7100+8910 8100+8910	0.1 mg/m <sup>3</sup> (t); 1.5 mg/m <sup>3</sup> (o) -skin-	500 mg/m <sup>3</sup>	Substance for which an ACGIH BEI (Methemoglobin inducer) exists
<b>Triorthocresyl Phosphate</b> 78-30-8	o-Tritolyl Phosphate; TCP; TOCP; Tricresylphosphate	R/P	2740R95 7940/7990 8970/8940 8990	0.1 mg/m <sup>3</sup> (o)(t); -skin-	40 mg/m <sup>3</sup>	t-A4, substance for which as ACGIH BEI exists (Acetylcholinesterase Inhibiting Pesticide)
<b>Triphenyl Amine</b> 603-34-9		N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	5 mg/m <sup>3</sup> (t)		
<b>Triphenyl Phosphate</b> 115-86-6	Phenyl phosphate; TPP	N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	3 mg/m <sup>3</sup>	1,000 mg/m <sup>3</sup>	t-A4, use 8100 & 8910 if heat is involved
<b>Tripoli</b>	(See Silica-Crystalline)					
<b>Tungsten*, &amp; Insoluble Compounds (as W)</b> *7440-33-7		N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	5 mg/m <sup>3</sup> (t); 10 mg/m <sup>3</sup> (s)-(t)		
<b>Tungsten, Metal Fume (as W)</b> 7440-33-7		N	2310/2315N99 2400/2800N95	5 mg/m <sup>3</sup> (t); 10 mg/m <sup>3</sup> (s)-(t)		
<b>Tungsten, Soluble Compounds (as W)</b>		N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	1 mg/m <sup>3</sup> (t); 3 mg/m <sup>3</sup> (s)-(t) {water soluble}		
<b>Turpentine</b> 8006-64-2	Gumspirits, Gum turpentine, Spirits of turpentine, Steam distilled turpentine, Sulfate wood turpentine, Turps, Wood turpentine	FF-OV	9001/2/3+ 7100	100 ppm (o)	800 ppm	Add particulate prefilter if particulate is present
<b>-U-</b>						
<b>Uranium (natural*), insoluble compounds (as U)</b> *7440-61-1		NRP100	2730N100 2360P100 8940/8990	0.05 mg/m <sup>3</sup> (o) 0.2 mg/m <sup>3</sup> (t); 0.6 mg/m <sup>3</sup> (s)-(t)	10 mg/m <sup>3</sup> (as U)	t-A1 Refer to 10CFR20 Subpart H

Chemical – CAS#	Synonyms	Filter Type	Moldex Suggested	TLV(t) PEL(o)	IDLH	Comments
<b>Uranium (Natural)*, Soluble Compounds (as U)</b> 7440-61-1		AG/P100	7200+7940 8200+8940	0.05 mg/m <sup>3</sup> (o); 0.2 mg/m <sup>3</sup> (t); 0.6 mg/m <sup>3</sup> (s)-(t)	10 mg/m <sup>3</sup> (as U) <b>{water soluble}</b>	t-A1 Refer to 10CR20 Subpart H
<b>-V-</b>						
<b>n-Valeraldehyde</b> 110-62-3	Amyl aldehyde, Pentanal, Valeral, Valeraldehyde, Valeric Aldehyde	FF-OV	9001/2/3+ 7100	50 ppm (t)	N.D.	
<b>Vanadium Pentoxide Dust (as V<sub>2</sub>O<sub>5</sub>)</b> 1314-62-1		N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	0.05 mg/m <sup>3</sup> (t); Respirable dust 0.5 mg/m <sup>3</sup> (c)-(o)	35 mg/m <sup>3</sup> (as V)	t-A4, Substance for which an ACGIH BEI exists. ACGIH NIC to 0.05 mg/m <sup>3</sup> measured as inhalable fraction of the aerosol and t-A3
<b>Vanadium Pentoxide Fume (as V<sub>2</sub>O<sub>5</sub>)</b> 1314-62-1		N	2310/2315N99 2400/2800N95	0.05 mg/m <sup>3</sup> (t); 0.1 mg/m <sup>3</sup> (c)(o)	35 mg/m <sup>3</sup> (as V)	t-A4, Substance for which an ACGIH BEI exists. ACGIH NIC to 0.05 mg/m <sup>3</sup> measured as inhalable fraction of the aerosol and t-A3
<b>Vegetable Oil, Mists (Except Caster, Cashew Nut or Similar Irritant Oils)</b>		RP	2740R95/8970 7940/7990 8940/8990	Total particulates 15 mg/m <sup>3</sup> (o); Respirable fraction 5 mg/m <sup>3</sup> (o)		
<b>Vinyl Acetate</b> 108-05-4	1-Acetoxyethylene, Ethenyl acetate, Ethenyl ethanoate, VAC, Vinyl acetate monomer, Vinyl ethanoate	FF-OV	9001/2/3+ 7100	10 ppm (t) 15 ppm (s)-(t)	N.D.	Add particulate prefilter if particulate is present
<b>Vinyl Benzene</b> 100-42-5	(See Styrene, Monomer)					
<b>Vinyl Cyanide</b> 107-13-1	(See Acrylonitrile)					
<b>Vinyl Toluene</b> 25013-15-4	Ethenylmethylbenzene, Methylstyrene, Tolyethylene	FF-OV	9001/2/3+ 7100	50 ppm (t) 100 ppm (s)-(t) 100 ppm (o)	400 ppm	t-A4 <b>*Add particulate prefilter if particulate is present</b>
<b>VM &amp; P Naphtha</b> 8032-32-4	Ligroin, Painters naphtha, Petroleum ether, Petroleum spirit, Refined solvent naphtha, Varnish makers & painters naphtha	FF-OV	9001/2/3+ 7100			
<b>-W-</b>						
<b>Warfarin</b> 81-81-2		N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	0.1 mg/m <sup>3</sup> (o)(t)	100 mg/m <sup>3</sup>	
<b>Welding Fumes (Not Otherwise Classified)</b>		N	2310/2315N99 2400/2800N95			
<b>Wood Dust, All Varieties Except Softwood and Western Red Cedar</b>		N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	1 mg/m <sup>3</sup> (t)*		*Inhalable fraction, t-A1 Beech, Oak; t-A2 Birch, Mahogany, Walnut; t-A4 all other species.
<b>Wood Dust, Western Red Cedar</b>		N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	.5 mg/m <sup>3</sup> * -SEN-		Inhalable fraction, t-A4
<b>-X-</b>						
<b>Xylenes (o-, m-, &amp; p-Isomers)</b>	1,2-Dimethyl-Benzene; 1,3-Dimethyl-Benzene; 1,4-Dimethyl-Benzene	OV	7100 8100	100 ppm (o)(t); 150 ppm (s)-(t)	900 ppm	Substance for which an ACGIH BEI exists, t-A4
<b>m-Xylene a,a-Diamine</b> 1477-55-0	MXDA	OV/N	7100+8910 8100+8910	0.1 mg/m <sup>3</sup> (c)(t); -skin-		
<b>Xylidine (Mixed Isomers)</b> 1300-73-8	Aminodimethyl Benzene; Dimethylaniline; 2,4 Dimethylaniline; Dimethylaminobenzene	OV	7100 8100	5 ppm (o); 0.5 ppm (t); -skin-	50 ppm	Substance for which ACGIH BEI (Methemoglobin inducer) exists, t-A3; ACGIH NIC to inhalable vapor & aerosol

Chemical – CAS#	Synonyms	Filter Type	Moldex Suggested	TLV(t) PEL(o)	IDLH	Comments
<b>-Y-</b>						
<b>Yttrium*, Metal &amp; cpds; Dusts &amp; Metals (as Y)</b> *7440-65-5	Specific Compounds	N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	1 mg/m <sup>3</sup> (o)(t)	500 mg/m <sup>3</sup>	
<b>-Z-</b>						
<b>Zinc Chloride, Fume</b> 7646-85-7		N	2310/2315N99 2400/2800N95	1 mg/m <sup>3</sup> (o)(t); 2 mg/m <sup>3</sup> (s)-(t)	50 mg/m <sup>3</sup>	
<b>Zinc Chromate as cr</b>	Basic Zinc Chromate, Zinc Yellow	N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	0.01 mg/m <sup>3</sup> 0.1 mg/m <sup>3</sup> (c)-(t) as CrO <sub>3</sub>		t-A1
<b>Zinc Oxide, Dust</b> 1314-13-2	Calamine; Chinese White; Zinc White	N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	Total particulates 15 mg/m <sup>3</sup> (o); Respirable fraction 5 mg/m <sup>3</sup> (o) 10 mg/m <sup>3</sup> (s)-(t) 2 mg/m <sup>3</sup> (t)	500 mg/m <sup>3</sup>	
<b>Zinc oxide, fume</b> 1314-13-2		N	2310/2315N99 2400/2800N95	5 mg/m <sup>3</sup> (o)	500 mg/m <sup>3</sup>	
<b>Zinc stearate</b> 557-05-1	Synpro stearate; Zinc distearate; Dermatone	N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	Total dust 10 mg/m <sup>3</sup> (t), 15 mg/m <sup>3</sup> (o); Respirable fraction 5 mg/m <sup>3</sup> (o)		
<b>Zirconium* compounds dusts and mists (as Zr)</b> *7440-67-7		N	EZ22/EZ23N95 2200/2300N95 2600/2700N95	5 mg/m <sup>3</sup> (o)(t); 10 mg/m <sup>3</sup> (s)-(t) {water based mists}	50 mg/m <sup>3</sup>	t-A4
<b>Zirconium fume (as Zr)</b> 7440-67-7		N	2310/2315N99 2400/2800N95	5 mg/m <sup>3</sup> (o)(t); 10 mg/m <sup>3</sup> (s)-(t)	50 mg/m <sup>3</sup>	t-A4

# CHANGEOUT SCHEDULES

OSHA 1910.134(d) requires that the employer implement a change schedule for cartridges based on objective information or data that will ensure cartridges are changed before the end of their service life (see OSHA1910.134 for complete text). A cartridge's useful service life is how long it provides adequate protection from harmful chemicals in the air. The service life of a cartridge depends on many factors, including environmental conditions, breathing rate, cartridge filtering capacity and the amount of contaminants in the air.

If you know what the chemical is and how much of it you are exposed to, then you are ready to estimate how long your respirator cartridges will work and apply the safety factor.

You must use some type of objective data to develop a changeout schedule. Options for determining a cartridge's service life include:

1. Conducting experimental tests.
2. Using a mathematical model like the "Advisor Genius" or "Breakthrough Software."

OSHA has on its website other means of calculating breakthrough times for various chemicals. You may also wish to consider use of this website in developing your changeout schedules. Be advised that actual service life can vary considerably from those calculated using these models. These models only provide rough estimates. Some of the data you will need specific to the Moldex cartridges in order to use the models on the OSHA website are:

- 8100 has an average of 36.7 grams Organic Vapor Carbon, its height is 2.13 cm, inside diameter is 7.85 cm.
- 8600 has an adsorbing equivalent of 28 grams Organic Vapor Carbon
- It's height is 2.34 cm, inside diameter is 7.85 cm.
- A change out schedule worksheet is provided.
- 7100 has an average of 42.5 grams Organic Vapor Carbon, its height is 2.06 cm, inside diameter is 7.81 cm.
- 7600 has an absorbing equivalent of 36.0 grams Organic Vapor Carbon, its height is 2.06 cm, inside diameter is 7.81 cm.

## CARTRIDGE DETAILS

### READ THIS WARNING

These weights were estimated by Miller-Nelson using methods based on their tests. It is suggested that you use default values provided by OSHA for the other cartridge specific parameters. Lastly, in order for the OSHA models to be used you may have to provide other pertinent data on the challenge agent which may be found on the MSDS or from the chemical manufacturer. These models can be found at [http://www.osha.gov/SLTC/etools/respiratory/change\\_schedule.html](http://www.osha.gov/SLTC/etools/respiratory/change_schedule.html). They are called "Respirator Change Schedules."

Moldex suggests that you use the OSHA models, or other means provided by OSHA. Moldex always recommends that you utilize the most conservative (shortest) breakthrough times. Moldex recommends that you use any of the methods only for the contaminants contained in this guide.

For more detailed information on these methods, refer to OSHA's website at:

[http://www.osha.gov/SLTC/etools/respiratory/mathmodel\\_advisorgenius.html](http://www.osha.gov/SLTC/etools/respiratory/mathmodel_advisorgenius.html)

[http://www.osha.gov/SLTC/etools/respiratory/change\\_schedule\\_mathmodel.html](http://www.osha.gov/SLTC/etools/respiratory/change_schedule_mathmodel.html)

If you have any questions please feel free to call Moldex Technical Services at +1 (800) 421-0668 and +1 (310) 837-6500, ext. 512/550.



# 8000 CARTRIDGE CHANGE SCHEDULE WORKSHEET

**Duties / Job Classification:** \_\_\_\_\_

**Location:** \_\_\_\_\_

**Chemical Information (from MSDS or Manufacturer)**

**Chemical:** \_\_\_\_\_

**Exposure Limit:** \_\_\_\_\_

**Maximum Concentration:** \_\_\_\_\_

**Boiling Point:** \_\_\_\_\_

**Molecular Weight:** \_\_\_\_\_

**Liquid Density:** \_\_\_\_\_

**Vapor Pressure:** \_\_\_\_\_

**Molecular Polarization:** \_\_\_\_\_

**Refractive Index:** \_\_\_\_\_

**Worksite Conditions**

**Maximum Expected Temperature (°C):** \_\_\_\_\_

**Maximum Expected Relative Humidity (%):** \_\_\_\_\_

**Work Rate:** Light    Moderate    Heavy

**Number of Shifts/Week:** \_\_\_\_\_

**Hours Cartridge Used/Shift:** \_\_\_\_\_

**8000 Cartridge Data**

<b># of Cartridges:</b>	_____	2
<b>8100 Absorbing Equivalent (grams):</b>	_____	36.7
<b>8100 Cartridge Bed Height (cm):</b>	_____	2.13
<b>8600 Absorbing Equivalent (grams):</b>	_____	28.0
<b>8600 Cartridge Bed Height (cm):</b>	_____	2.34
<b>8100 &amp; 8600 Bed Diameter (cm):</b>	_____	7.85

**Service Life Estimate:** \_\_\_\_\_

**Basis Used:** \_\_\_\_\_

**Cartridge Change Schedule Every \_\_\_\_\_ Hours**

**After Each Shift:** \_\_\_\_\_

**Other:** \_\_\_\_\_

This form may be used to assist you in developing a changeout schedule when using 8100 or 8600 cartridges for protection against organic vapors.

Be advised, this is simply a tool to help you collect some of the pertinent data in developing a changeout schedule. It is your responsibility to ensure the accuracy of the schedules that you develop for each operation and work site.



# 7000 CARTRIDGE CHANGE SCHEDULE WORKSHEET

(For use with 7000 or 9000 Series Respirators)

**Duties / Job Classification:** \_\_\_\_\_

**Location:** \_\_\_\_\_

**Chemical Information (from MSDS or Manufacturer)**

**Chemical:** \_\_\_\_\_

**Exposure Limit:** \_\_\_\_\_

**Maximum Concentration:** \_\_\_\_\_

**Boiling Point:** \_\_\_\_\_

**Molecular Weight:** \_\_\_\_\_

**Liquid Density:** \_\_\_\_\_

**Vapor Pressure:** \_\_\_\_\_

**Molecular Polarization:** \_\_\_\_\_

**Refractive Index:** \_\_\_\_\_

**Worksite Conditions**

**Maximum Expected Temperature (°C):** \_\_\_\_\_

**Maximum Expected Relative Humidity (%):** \_\_\_\_\_

**Work Rate:** \_\_\_\_\_ Light    Moderate    Heavy

**Number of Shifts/Week:** \_\_\_\_\_

**Hours Cartridge Used/Shift:** \_\_\_\_\_

**7000 Cartridge Data**

<b># of Cartridges:</b>	_____ 2 _____
<b>7100 Absorbing Equivalent (grams):</b>	_____ 42.5 _____
<b>7100 Cartridge Bed Height (cm):</b>	_____ 2.06 _____
<b>7600 Absorbing Equivalent (grams):</b>	_____ 36.0 _____
<b>7600 Cartridge Bed Height (cm):</b>	_____ 2.06 _____
<b>7100 &amp; 7600 Bed Diameter (cm):</b>	_____ 7.81 _____

**Service Life Estimate:** \_\_\_\_\_

**Basis Used:** \_\_\_\_\_

**Cartridge Change Schedule Every \_\_\_\_\_ Hours**

**After Each Shift:** \_\_\_\_\_

**Other:** \_\_\_\_\_

This form may be used to assist you in developing a changeout schedule when using 8100 or 8600 cartridges for protection against organic vapors.

Be advised, this is simply a tool to help you collect some of the pertinent data in developing a changeout schedule. It is your responsibility to ensure the accuracy of the schedules that you develop for each operation and work site.

# DO NOT USE AGAINST

Moldex respirators may not be used to protect against the following list of chemicals *when concentrations are at or above the OSHA Permissible Exposure Limit (PEL)*. In the event that a PEL is exceeded, we suggest that you consult an Industrial Hygienist or other health and safety professional to determine the appropriate form of protection against any of these chemicals. This list is not all inclusive.

<b>-A-</b>	<b>CAS #s</b>		<b>CAS #s</b>
ACETONE CYANOHYDRIN	75-86-5	bis-CHLOROMETHYL ETHER	542-88-1
ACETONITRILE	75-05-8	CHLOROMETHYL METHYL ETHER	107-30-2
2-ACETYLAMINOFLUORENE	53-96-3	p-CHLORONITROBENZENE	100-00-5
ACROLEIN	107-02-8	1-CHLORO-1-NITROPROPANE	600-25-9
ACRYLIC ACID, HYDROXYPROPYL ESTER	25584-83-2	CHLOROPENTAFLUOROETHANE	76-15-3
ACRYLIC ACID, 2-ETHYLHEXYL ESTER	103-11-7	b-CHLOROPRENE	126-99-8
ADIPONITRILE	111-69-3	2-CHLOROPROPIONIC ACID	598-78-7
ALDRIN	309-00-2	o-CHLOROSTYRENE	2039-87-4
ALLYL GLYCIDYL ETHER	106-92-3	2-CHLORO-1,1,1,2-TETRAFLUOROETHANE	2387-89-0
ALLYL PROPYL DISULFIDE	2179-59-1	CHLOROTRIFLUOROETHYLENE	79-38-9
4-AMINODIPHENYL	92-67-1	CHROMYL CHLORIDE	14977-61-8
2-AMINOPYRIDINE	504-29-0	COBALT CARBONYL	10210-68-1
3-AMINO-1,2,4-TRIAZOLE	61-82-5	COBALT HYDROCARBONYL	16842-03-8
AMITROLE	61-82-5	CYANIDES, as CN	420-04-2
ANTIMONYHYDRIDE	7803-52-3	CYANOGEN	460-19-5
ARSINE	7784-42-1	CYANOGEN CHLORIDE	506-77-4
		CYCLOHEXANETHIOL	1569-69-3
		CYCLOPENTANE	287-92-3
<b>-B-</b>		<b>-D-</b>	
BENZIDINE	92-87-5	DDT (DICHLORODIPHENYL-TRICHLOROETHANE)	50-29-3
BENZOTRICHLORIDE	98-07-7	DECABORANE	17702-41-9
BENZOYLCHLORIDE	98-88-4	DEH26	112-57-2
BORON TRIBROMIDE	10294-33-4	DEMETON	8065-48-3
BORON TRIFLUORIDE	7637-07-2	2,4 DIAMINOANISOLE AND SALTS	615-05-4
BROMINE PENTAFLUORIDE	7789-30-2	2,4- DIAMINOTOLUENE	95-80-7
BROMOCHLOROMETHANE	74-97-5	o-DIANSIDINE (3,3'-DIMETHOXYBENZIDENE)	
BROMOETHANE	74-96-4	& DYES METABOLIZED TO THIS COMPOUND	19-90-4
BROMOTRIFLUOROMETHANE	75-63-8	DIAZOMETHANE	34-88-3
BUTANE	106-97-8	DIBORANE	19287-45-7
p-tert-BUTYLTOLUENE	98-51-1	1,2-DIBROMO-3-CHLOROPROPANE (DBCP)	96-12-8
n-BUTYL GLYCIDYL ETHER (BGE)	2426-08-6	2-N-DIBUTYLAMINOETHANOL	102-81-8
<b>-C-</b>		DICHLOROACETYLENE	7572-29-4
CALCIUM CYANIDE	592-01-8	3,3-DICHLOROBENZIDENE (AND ITS SALTS)	91-94-1
APTAFOL	2425-06-1	1,4-DICHLORO-2-BUTENE	764-41-0
CARBARYL	63-25-2	DICHLORODIFLUOROMETHANE (FC-12)	75-43-4
CARBOFURAN	1563-66-2	DICHLORODIPHENYL-TRICHLOROETHANE	50-29-3
CARBON DIOXIDE	124-38-9	1,1-DICHLOROETHANE	75-35-4
CARBON MONOXIDE	630-08-0	1,2-DICHLOROETHANE	107-06-2
CARBON TETRABROMIDE	558-13-4	DICHLOROETHYNE	7572-29-4
CARBON TETRACHLORIDE	56-23-5	1,1-DICHLOROETHYLENE	75-35-4
CARBONYL CHLORIDE	75-44-5	DICHLOROFLUOROMETHANE (FC-21)	75-43-4
CARBONYL FLUORIDE*	353-50-4	1,1-DICHLORO-FLUOROETHANE	
CHLORDANE	57-74-9	DICHLOROMETHANE	75-09-2
CHLORDECONE	143-50-0	1,1-DICHLORO-1-NITROETHANE	594-72-9
CHLORINATED CAMPHENE	8001-35-2	1,3-DICHLOROPROPENE	542-75-6
CHLORINATED DIPHENYL OXIDE	55720-99-5	2,2-DICHLOROPROPIONIC ACID	75-99-0
CHLORINE TRIFLUORIDE	7790-91-2	2,2-DICHLOROPROPIONIC ACID SODIUM SALT	127-20-8
CHLOROACETALDEHYDE	107-20-0	DICHLOROTETRAFLUOROETHANE	
CHLOROACETONE	78-95-5	(1,2-DICHLORO-1,1,2,2-TETRAFLUOROETHANE)	76-14-2
CHLOROACETYL CHLORIDE	79-04-9	DICHLORVOS (DDVP)	62-73-7
CHLOROBROMOMETHANE	74-97-5	DIELDRIN	60-57-1
2-CHLORO-1,3-BUTADIENE	126-99-8	DIESEL EXHAUST	N/A
1-CHLORO-1,1-DIFLUOROETHANE	75-68-3	DIETHYLENE OXIDE	754-12-1
1-CHLORO,2,3-EPOXY-PROPANE	106-89-8	DIETHYLENE TRIAMINE	111-40-0
CHLORODIFLUOROMETHANE	75-45-6	DIFLUORODIBROMOMETHANE	75-61-6
1-CHLORO,2,3-EPOXY-PROPANE	106-89-8	1,1-DIFLUOROETHANE	75-37-6
CHLOROETHANE	75-00-3	1,1-DIFLUOROETHYLENE	75-38-7
CHLOROETHYLENE	75-01-4	DIFLUOROMETHANE	75-10-5
CHLOROFORM	67-66-3	DIGLYCIDYL ETHER (DGE)	2238-07-5
bis (2-CHLOROISOPROPYL) ETHER	108-60-1	3-3'-DIMETHYLBENZIDENE	119-93-7

# DO NOT USE AGAINST (Continued)

	<b>CAS #s</b>		<b>CAS #s</b>
3-3'-DIMETHOXYBENZIDENE	119-90-4	2-HYDROXYPROPYL ACRYLATE	999-61-1
DIMETHOXYMETHANE	109-87-5	HYDROXYPROPYL ACRYLATE	25584-83-2
DIMETHYLACETAMIDE	127-19-5		
N,N-DIMETHYLACETAMIDE	127-19-5	<b>-I-</b>	
4-DIMETHYLAMINOAZOBENZENE	60-11-7	IODINE	553-56-2
bis-(2-DIMETHYLAMINOETHYL) ETHER	3033-62-3	IODIFORM	75-47-8
DIMETHYLAMINOPROPIONITRILE	1738-25-6	IRON PENTACARBONYL	13463-40-6
DIMETHYL CARBAMOYL CHLORIDE	79-44-7	ISOBUTANE	75-28-5
DIMETHYL ETHER	115-10-6	ISOCTYL ALCOHOL	26952-21-6
DIMETHYLETHOXYLSILANE	14857-34-2	ISOCYANATES	71000-82-3
DIMETHYL FORMAMIDE	68-12-2	ISOPHORONE DIISOCYANATE	4098-71-9
1,1-DIMETHYLHYDRAZINE	57-14-7	n-ISOPROPYLANILINE	768-52-5
N,N DIMETHYLNITROSOAMINE	62-75-9	ISOPROPYL GLYCIDYL ETHER	4016-14-2
DIMETHYL SULFATE	77-78-1		
4,4-DIPHENYLMETHANE DIISOCYANATE	101-68-8	<b>-K-</b>	
DIPROPYLENE GLYCOL METHYL ETHER	34590-94-8	KEPONE	143-50-0
DIPROPYL KETONE	123-19-3	KETENE	463-51-4
2,6-DITERTBUTYL-P-CRESOL	128-37-0		
DIVINYL BENZENE	1321-74-0	<b>-L-</b>	
		L.P.G (LIQUIFIED PETROLEUM GAS)	68476-85-7
<b>-E-</b>			
ENFLURANE	13838-16-9	<b>-M-</b>	
ENZYMES, PROTEOLYTIC	1395-21-7	MALEIC ANHYDRIDE	108-31-6
EPICHLOROHYDRIN	106-89-8	MALONALDEHYDE	542-78-9
EPN	2104-64-5	MALONONITRILE	109-77-3
1,2-EPOXYPROPANE	75-56-9	MANGANESE CYCLOPENTADIENYL TRICARBONYL	12079-65-1
2,3-EPOXY-1-PROPANOL	556-52-5	MERCURY VAPOR	7439-97-6
ETHANE	74-84-0	MERCURY COMPOUNDS (EXCEPT ARYL COMPOUNDS AND INORGANIC DUSTS)	
ETHANOL	64-17-5	METHACRYLIC ACID	79-41-4
ETHYL ALCOHOL	64-17-5	METHANE	74-82-8
ETHYLAMINE	75-04-7	METHANOL	67-56-1
ETHYL BROMIDE	74-96-4	METHOXYACETIC ACID	625-45-6
ETHYL CHLORIDE	75-00-3	METHOXYCHLOR	72-43-5
ETHYL CYANOACRYLATE	7085-85-0	1 METHOXYPROPYL-2-ACETATE	108-65-6
ETHYLENE	74-85-1	2-(METHOXYMETHYL ETHOXY)-PROPANOL	34590-94-8
ETHYLENE DICHLORIDE	107-06-2	METHYL ACETYLENE	74-99-7
ETHYLENE GLYCOL DINITRATE	628-96-6	METHYL ACETYLENE PROPADIENE MIXTURE (MAPP)	59355-75-8
ETHYLENEIMINE	151-56-4	METHACRYLONITRILE	126-98-7
ETHYLENE OXIDE	75-21-8	METHYLAL	109-87-5
ETHYLENE THIOUREA	96-45-7	METHYLALACETALDEHYDE	123-38-6
ETHYL FORMATE	109-94-4	METHYL ALCOHOL	67-56-1
2-ETHYLHEXYL ACRYLATE	103-11-7	n-METHYL ANILINE	100-61-8
ETHYLIDENE CHLORIDE	75-34-3	2-METHYLAZIRIDINE	75-55-8
		METHYL BROMIDE	74-83-9
<b>-F-</b>		METHYL CHLORIDE	74-87-3
FLUORINE	7782-41-4	METHYL-2-CYANOACRYLATE	137-05-3
FLUOROETHENE	75-02-5	METHYLCYCLOHEXANE	108-87-2
FLUOROETHYLENE	75-02-5	METHYLCYCLOHEXANOL	25639-42-3
FLUOROTRICHLOROMETHANE	75-69-4	METHYLENE BISPHENYL ISOCYANATE	101-68-8
FORMAMIDE	75-12-7	METHYLENE CHLORIDE	75-09-2
FORMIC ACID, ETHYL ESTER	109-94-4	4,4-METHYLENE bis (2-CHLOROANILINE)	101-14-4
FORMIC ACID, METHYL ESTER	107-31-3	METHYLENE bis (4-CYCLOHEXYLISOCYANATE)	5124-30-1
FORMIC ACID	64-18-6	METHYL ETHYL KETONE PEROXIDE	1338-23-4
		METHYL ETHYL KETOXIME	96-29-7
<b>-G-</b>		METHYL FORMATE	107-31-3
GERMANIUM TETRAHYDRIDE	7782-65-2	METHYL HYDRAZINE	60-34-4
GLYCIDOL	556-52-5	METHYL IODIDE	74-88-4
GLYCOLONITRILE	107-16-4	METHYL ISOCYANATE	624-83-9
GLYOXOL	107-22-2	METHYL PROPANE	75-28-5
		2-METHYL PROPANE	75-28-5
<b>-H-</b>		N METHYL-2-PYROLIDINE	872-50-4
HEPTACHLOR	76-44-8	METHYL SILICATE	681-84-5
HEXACHLOROBUTADIENE	87-68-3	MEVINPHOS	7786-34-7
HEXACHLOROCYCLOPENTADIENE	77-47-4	MONOCHLOROACETYL CHLORIDE	79-04-9
1,4-HEXADIENE	592-45-0	METHYLCHLORO METHYL ETHER	107-30-2
HEXAFLUOROACETONE	684-16-2	MONOFUOROETHYLENE	75-02-5
HEXAFLUOROPROPYLENE	116-15-4	MONOMETHYL ANILINE	100-61-8
HEXAMETHYLENE DIISOCYANATE	822-06-0	N METHYLANILINE	100-61-8
HEXAMETHYL PHOSPHORAMIDE	680-31-9	MONOMETHYL HYDRAZINE	60-34-4
1,1,1,3,3,3,-HEXAFLUOROPROPANE	684-16-2		
HFE-7100		<b>-N-</b>	
HYDRAZINE	302-01-2	NAPHTHALENE DIISOCYANATE (NDI)	3173-72-6
HYDROGEN CYANIDE	74-90-8	1,5-NAPHTHALENE DIISOCYANATE	3173-72-6
HYDROGEN PEROXIDE	7722-84-1	NIAX CATALYST ESN	62765-93-9
HYDROGEN SELENIDE	7783-07-5		

# DO NOT USE AGAINST (Continued)

	<b>CAS #s</b>		<b>CAS #s</b>
NICKEL CARBONYL	13463-39-3	<b>-T-</b>	
NITRIC ACID	7697-37-2	TEDP	3689-24-5
NITRIC OXIDE	10102-43-9	TELLURIUM HEXAFLUORIDE	7783-80-4
4-NITROBIPHENYL (4-NITRODIPHENYL)	92-93-3	TEPP	107-49-3
p-NITROCHLOROBENZENE	100-00-5	2,3,7,8-TETRACHLORODIBENXO-p-DIOXIN (TCDD)	1746-01-6
4-(2-NITROBUTYL) MORPHOLINE (70% [2224-44-1] AND		1,1,1,2-TETRACHLORO-2,2-DIFLUOROETHANE	76-11-9
4,4'-(2 ETHYL-2-NITRO-1,3-PROPANEDIYL)		1,1,2,2-TETRACHLORO-1,2-DIFLUOROETHANE	76-12-0
BISMORPHOLINE (20% MIXTURE)	1854-23-5	1,1,2-TRICHLOROETHANE	79-00-5
NITROGEN DIOXIDE	10102-44-0	TETRACHLOROMETHANE	56-23-5
NITROGEN TRIFLUORIDE	7783-54-2	TETRACHLOROSILANE	10026-04-7
NITROGLYCERIN	55-63-0	TETRAETHYL LEAD	78-00-2
2-NITRONAPHTHALENE	581-89-5	TETRAETHYL PYROPHOSPHATE (TEPP)	107-49-3
n-NITROSODIMETHYLAMINE	62-75-9	1,1,1,2-TETRAFLUOROETHANE	811-97-2
NITROTRICHLOROMETHANE	76-06-2	2,3,3,3-TETRAFLUOROPROPENE	754-12-1
NITROUS OXIDE	10024-97-2	TETRAFLUOROETHYLENE	116-14-3
		TETRAMETHYLENE	754-12-1
<b>-O-</b>		TETRAMETHYL LEAD	75-74-1
OSMIUM TETROXIDE	20816-12-0	TETRAMETHYLSUCCINONITRILE	3333-52-6
OXYGEN DIFLUORIDE	7783-41-7	TETRANITROMETHANE	509-14-8
OZONE	10028-15-6	THIOGLYCOLIC ACID	68-11-1
		THIONYL CHLORIDE	7719-09-7
<b>-P-</b>		o-TOLIDINE	119-93-7
PENTABORANE	19624-22-7	o-TOLIDINE-BASED DYES	
1,1,1,2,2-PENTAFLUOROETHANE	354-33-6	o-TOLUIDINE	95-53-4
1,1,1,3,3-PENTAFLUOROPROPANE	460-73-1	m-TOLUIDINE	108-44-1
PERCHLORYL FLUORIDE	7616-94-6	p-TOLUIDINE	106-49-0
PERFLUOROISOBUTYLENE	382-21-8	TOLUENE 2,4-DIAMINE	95-80-7
PETROLEUM GAS	68476-85-7	TOLUENE 2,4-DIISOCYANATE (TDI)	26471-62-5
PHENYL GLYCIDYL ETHER	122-60-1	TOLUENE 2,6-DIISOCYANATE	91-08-7
PHENYLHYDRAZINE	100-63-0	TOXAPHENE	8001-35-2
N-PHENYL-B-NAPHTHYLAMINE	135-88-6	1,1,2-TRICHLOROETHANE	79-00-5
PHENYLPHOSPHINE	638-21-1	TRICHLOROMETHANE	67-66-3
PHOSDRIN	7786-34-7	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1
PHOSGENE	75-44-5	TRICHLOROFLUOROMETHANE	75-69-4
PHOSPHINE	7803-51-2	1,2,3-TRICHLOROPROPANE	96-18-4
PHOSPHOROUS (YELLOW)	7723-14-0	TRICHLOROSILANE	10025-78-2
PHOSPHOROUS OXYCHLORIDE	10025-87-3	TRIETHOXYSILANE	998-30-1
PHOSPHOROUS PENTACHLORIDE	10026-13-8	1,1,1-TRIFLUORO-2,2-DICHLOROETHANE	306-83-2
PHOSPHOROUS TRICHLORIDE	7719-12-2	TRIETHANOLAMINE	102-71-6
3-PICOLINE	108-99-6	TRIFLUOROBROMOMETHANE	75-63-8
4-PICOLINE	108-89-4	1,1,1-TRIFLUOROETHANE	420-46-2
POTASSIUM CYANIDE	151-50-8	2,2,2-TRIFLUOROETHANOL	75-89-8
PROPANE	74-98-6	TRIMETHOXYSILANE	2487-90-3
PROPANE SULTONE	1120-71-4		
b-PROPIOLACTONE	57-57-8	<b>-V-</b>	
PROPIONALDEHYDE	123-38-6	VINYL BROMIDE	593-60-2
PROPYLALDEHYDE	123-38-6	VINYL CHLORIDE	75-01-4
PROPYLENE GLYCOL DINITRATE	6423-43-4	4-VINYL CYCLOHEXENE	100-40-3
PROPYLENE GLYCOL MONOMETHYL ETHER ACETATE	70657-70-4	VINYLCYCLOHEXENE DIOXIDE	106-87-6
PROPYLENE IMINE	75-55-8	VINYLFLUORIDE	75-02-5
PROPYLENE OXIDE	75-56-9	VINYLDENE CHLORIDE	75-35-4
PROPYLENE	115-07-1	VINYLDENE FLUORIDE	75-38-7
n-PROPYL NITRATE	627-13-4		
PROPYNE	74-99-7		
<b>-S-</b>			
SELENIUM HEXAFLUORIDE	7783-79-1		
SILANE	7803-62-5		
SEVIN	63-25-2		
SILICON TETRAHYDRIDE	7803-62-5		
SODIUM AZIDE	26628-22-8		
SODIUM CYANIDE	143-33-9		
STIBINE	7803-52-3		
SUBTILISINS	1395-21-7		
SUCCINONITRILE	110-61-2		
SULFOTEP	3689-24-5		
SULFUR HEXAFLUORIDE	2551-62-4		
SULFUR PENTAFLUORIDE	5714-22-7		
SULFUR TETRAFLUORIDE	7783-60-0		
SULFURYL FLUORIDE	2699-79-8		
SYSTOX	8065-48-3		

# NOTES

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## TECHNICAL HELP LINE

For information, technical assistance, and training materials call +1 (800) 421-0668 or +1 (310) 837-6500, ext. 512/550.

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