

SUBPART Z -- TOXIC AND HAZARDOUS SUBSTANCES

1910.1000-AIR CONTAMINANTS

An employee's exposure to any substance listed in Table Z-1-A of this section shall be limited in accordance with the requirements of the following paragraphs of this section.

(a) **Table Z-1-A.** Limits for Air Contaminants

(1) & (2) **Enforcement of Transitional Limits has expired.** See Paragraph (3) for Limits.

(3) **Limits for Air Contaminants Columns.** An employee's exposure to any substance listed in Table Z-1-A shall not exceed the Time Weighted Average (TWA), Short Term Exposure Limit (STEL) and Ceiling Limit specified for that substance in Table Z-1-A.

(4) **Skin Designation.** To prevent or reduce skin absorption, an employee's skin exposure to substances listed in Table Z-1-A with an "X" in the Skin Designation column following the substance name shall be prevented or reduced to the extent necessary in the circumstances through the use of gloves, coveralls, goggles, or other appropriate personal protective equipment, engineering controls or work practices.

(5) **Definitions.** The following definitions are applicable to the Limits for Air Contaminants columns of Table Z-1-A:

(i) Time weighted average (TWA) is the employee's average airborne exposure in any 8-hour work shift of a 40-hour work week which shall not be exceeded.

(ii) Short term exposure limit (STEL) is the employee's 15-minute time weighted average exposure which shall not be exceeded at any time during a work day unless another time limit is specified in a parenthetical notation below the limit. If another time period is specified, the time weighted average exposure over that time period shall not be exceeded at any time during the working day.

(iii) Ceiling is the employee's exposure which shall not be exceeded during any part of the work day. If instantaneous monitoring is not feasible, then the ceiling shall be assessed as a 15-minute time weighted average exposure which shall not be exceeded at any time over a working day.

(6) **Additional Definition.** The terms "substance", "air contaminant", and "material" are equivalent in meaning for 29 CFR 1910.1000.

(b) **(Reserved)**

(c) **(Reserved)**

(d) **Computation formulae.** The computation formula which shall apply to employee exposure to more than one substance for which 8-hour time weighted averages are listed in subpart Z of 29 CFR Part 1910 in order to determine whether an employee is exposed over the regulatory limit is as follows:

(1)

(i) The cumulative exposure for an 8-hour work shift shall be computed as follows:

$$E = (C_a T_a + C_b T_b + \dots + C_n T_n) \div 8$$

Where:

E is the equivalent exposure for the working shift.

C is the concentration during any period of time T where the concentration remains constant.

T is the duration in hours of the exposure at the concentration C.

The value of E shall not exceed the 8-hour time weighted average specified in Subpart Z or 29 CFR part 1910 for the material involved.

(ii) To illustrate the formula prescribed in paragraph (d)(1)(i) of this section, assume that Substance A has an 8-hour time weighted average limit of 100 ppm noted in Table Z-1-A. Assume that an employee is subject to the following exposure:

Two hours exposure at 150 ppm

Two hours exposure at 75 ppm

Four hours exposure at 50 ppm

Substituting this information in the formula, we have: $(2 \times 150 + 2 \times 75 + 4 \times 50) \div 8 = 81.25$ ppm

Since 81.25 ppm is less than 100 ppm, the 8-hour time weighted average limit, the exposure is acceptable.

(2)

- (i) in case of a mixture of air contaminants an employer shall compute the equivalent exposure as follows: $E_m = (C_1 \div L_1) + (C_2 \div L_2) + \dots + (C_n \div L_n)$

Where:

E_m is the equivalent exposure for the mixture.

C is the concentration of a particular contaminant.

L is the exposure limit for that substance specified in Subpart Z of 29 CFR part 1910.

The value of E_m shall not exceed unity (1).

- (ii) To illustrate the formula prescribed in paragraph (d)(2)(i) of this section, consider the following exposures:

Substance	Actual concentration of 8 hour exposure (ppm)	8 hr. TWA PEL (ppm)
B	500	1000
C	45	200
D	40	200

Substituting in the formula, we have: $E_m = 500 \div 1000 + 45 \div 200 + 40 \div 200$
 $E_m = 0.500 + 0.225 + 0.200$
 $E_m = 0.925$

Since E_m is less than unity (1), the exposure combination is within acceptable limits.

(e) To achieve compliance with paragraphs (a) through (d) of this section, administrative or engineering controls must first be determined and implemented whenever feasible. When such controls are not feasible to achieve full compliance, protective equipment or any other protective measures shall be used to keep the exposure of employees to air contaminants within the limits prescribed in this section. Any equipment and/or technical measures used for this purpose must be approved for each particular use by a competent industrial hygienist or other technically qualified person. Whenever respirators are used, their use shall comply with § 1910.134.

(f) **Effective dates.** The effective date for the permissible exposure limits specified in the Limits for Air Contaminants columns of Table Z-1-A is March 13, 1989. Subsequent corrections and amendments were adopted on November 13, 1989; February 26, 1990; July 16, 1990; November 13, 1990; August 26, 1991; and November 23, 1992. The skin designations in the Limits for Air Contaminants columns became effective September 1, 1989. Enforcement of the limits are indefinitely stayed for: aluminum alkyls; ethylidene norbornene; hexafluoroacetone; mercury (alkyl compounds); oxygen difluoride; phenylphosphine; and sulfur pentafluoride, until sampling and analytical techniques are available.

Note: Abbreviations used in Table Z-1-A

ppm — Parts of vapor or gas per million parts of contaminated air by volume at 25 degrees C and 760 torr.

mg/m³ — Approximate milligrams of substance per cubic meter of air.

STEL — Short Term Exposure Limit, duration is 15 minutes, unless otherwise noted.

CAS No. — Chemical Abstract Number, the CAS number is for information only. Enforcement is based on the substance name. For an entry covering more than one metal compound measured as the metal, the CAS number for the metal is given—not the CAS numbers for the individual compounds.

TABLE Z-1-A, LIMITS FOR AIR CONTAMINANTS
Permissible Exposure Limits

Substance	CAS No.	TWA		STEL		CEILING		Skin	Designation
		ppm	mg/m ³	ppm	mg/m ³	ppm	mg/m ³		
Acetaldehyde	75-07-0	100	180	150	270	---	---	---	
Acetic acid	64-19-7	10	25	---	---	---	---	---	
Acetic anhydride	108-24-7	---	---	---	---	5	20	---	
Acetone	67-64-1	750	1800	1000	2400	---	---	---	
Acetonitrile	75-05-8	40	70	60	105	---	---	---	
2-Acetylaminofluorine; see 1910.1003	53-96-3								
Acetylene dichloride; see 1,2-Dichloroethylene									
Acetylene tetrabromide	79-27-6	1	14	---	---	---	---	---	
Acetylsalicylic acid (Aspirin)	50-78-2	---	5	---	---	---	---	---	
Acrolein	107-02-8	0.1	0.25	0.3	0.8	---	---	---	
Acrylamide	79-06-1	---	0.03	---	---	---	---	---	X
Acrylic acid	79-10-7	10	30	---	---	---	---	---	X
Acrylonitrile; see 1910.1045	107-13-1								
Aldrin	309-00-2	---	0.25	---	---	---	---	---	X
Allyl alcohol	107-18-6	2	5	4	10	---	---	---	X
Allyl chloride	107-05-1	1	3	2	6	---	---	---	
Allyl glycidyl ether (AGE)	106-92-3	5	22	10	44	---	---	---	
Allyl propyl disulfide	2179-59-1	2	12	3	18	---	---	---	
alpha-Alumina Total dust	1344-28-1	---	10	---	---	---	---	---	
Respirable fraction		---	5	---	---	---	---	---	
Aluminum (as Al) Metal	7429-90-5								
Total dust		---	15	---	---	---	---	---	
Respirable fraction		---	5	---	---	---	---	---	
Pyro powders		---	5	---	---	---	---	---	
Welding fumes		---	5	---	---	---	---	---	
Soluble salts		---	2	---	---	---	---	---	
Alkyls	---	---	2	---	---	---	---	---	
4-Aminodiphenyl; see 1910.1003	92-67-1								
2-Aminoethanol; see Ethanolamine									
2-Aminopyridine	504-29-0	0.5	2	---	---	---	---	---	
Amitrole	61-82-5	---	0.2	---	---	---	---	---	
Ammonia	7664-41-7	---	---	35	27	---	---	---	
Ammonium chloride fume	12125-02-9	---	10	---	20	---	---	---	
Ammonium sulfamate Total dust	7773-06-0	---	10	---	---	---	---	---	
Respirable fraction		---	5	---	---	---	---	---	
n-Amyl acetate	628-63-7	100	525	---	---	---	---	---	
sec-Amyl acetate	626-38-0	125	650	---	---	---	---	---	
Aniline and homologs	62-53-3	2	8	---	---	---	---	---	X
Anisidine (o-,p-isomers)	29191-52-4	---	0.5	---	---	---	---	---	X
Antimony and compounds (as Sb)	7440-36-0	---	0.5	---	---	---	---	---	
ANTU (Alpha naphthyl- thiourea)	86-88-4	---	0.3	---	---	---	---	---	
Arsenic, organic compounds (as As)	7440-32-2	---	0.5	---	---	---	---	---	
Arsenic, inorganic compounds (as As); see 1910.1018	7440-38-2								
Arsine	7784-42-1	0.05	0.2	---	---	---	---	---	
Asbestos; see 1910.1001	Varies								

Substance	CAS No.	TWA		STEL		CEILING		Skin Designation
		ppm	mg/m ³	ppm	mg/m ³	ppm	mg/m ³	
Atrazine	1912-24-9	---	5	---	---	---	---	---
Azinphos-methyl	86-50-0	---	0.2	---	---	---	---	X
Barium, soluble compounds (as Ba)	7440-39-3	---	0.5	---	---	---	---	---
Barium sulfate	7727-43-7	---	---	---	---	---	---	---
Total dust		---	10	---	---	---	---	---
Respirable fraction		---	5	---	---	---	---	---
Benomyl	17804-35-2	---	---	---	---	---	---	---
Total dust		---	10	---	---	---	---	---
Respirable fraction		---	5	---	---	---	---	---
Benzene; see 1910.1028	71-43-2	---	---	---	---	---	---	---
Benzidine; see 1910.1003	92-87-5	---	---	---	---	---	---	---
p-Benzoquinone; see Quinone		---	---	---	---	---	---	---
Benzo(a)pyrene; see Coal tar pitch volatiles		---	---	---	---	---	---	---
Benzoyl peroxide	94-36-0	---	5	---	---	---	---	---
Benzyl chloride	100-44-7	1	5	---	---	---	---	---
Beryllium and beryllium compounds (as Be)	7440-41-7	---	0.002	---	0.005 (30 min)	---	0.025	---
Biphenyl; see Diphenyl		---	---	---	---	---	---	---
Bismuth telluride, Undoped	1304-82-1	---	---	---	---	---	---	---
Total dust		---	15	---	---	---	---	---
Respirable fraction		---	5	---	---	---	---	---
Bismuth telluride, Se-doped		---	5	---	---	---	---	---
Borates, tetra, sodium salts		---	---	---	---	---	---	---
Anhydrous	1330-43-4	---	10	---	---	---	---	---
Decahydrate	1303-96-4	---	10	---	---	---	---	---
Pentahydrate	12179-04-3	---	10	---	---	---	---	---
Boron oxide	1303-86-2	---	---	---	---	---	---	---
Total dust		---	10	---	---	---	---	---
Respirable fraction		---	5	---	---	---	---	---
Boron tribromide	10294-33-4	---	---	---	---	1	10	---
Boron trifluoride	7637-07-2	---	---	---	---	1	3	---
Bromacil	314-40-9	1	10	---	---	---	---	---
Bromine	7726-95-6	0.1	0.7	0.3	2	---	---	---
Bromine pentafluoride	7789-30-2	0.1	0.7	---	---	---	---	---
Bromoform	75-25-2	0.5	5	---	---	---	---	X
Butadiene (1,3-Butadiene); see 1910.1051	106-99-0	---	---	---	---	---	---	---
Butane	106-97-8	800	1900	---	---	---	---	---
Butanethiol; see Butyl mercaptan		---	---	---	---	---	---	---
2-Butanone (Methyl ethyl ketone)	79-93-3	200	590	300	885	---	---	---
2-Butoxyethanol	111-76-2	25	120	---	---	---	---	X
n-Butyl acetate	123-86-4	150	710	200	950	---	---	---
sec-Butyl acetate	105-46-4	200	950	---	---	---	---	---
tert-Butyl acetate	540-88-5	200	950	---	---	---	---	---
Butyl acrylate	141-32-2	10	55	---	---	---	---	---
n-Butyl alcohol	71-36-3	---	---	---	---	50	150	X
sec-Butyl alcohol	78-92-2	100	305	---	---	---	---	---
tert-Butyl alcohol	75-65-0	100	300	150	450	---	---	---
Butylamine	109-73-9	---	---	---	---	5	15	X
tert-Butyl chromate (as CrO ₃)	1189-85-1	---	---	---	---	---	0.1	X
n-Butyl glycidyl ether (BGE)	2426-08-6	25	135	---	---	---	---	---
n-Butyl lactate	138-22-7	5	25	---	---	---	---	---
Butyl mercaptan	109-79-5	0.5	1.5	---	---	---	---	---
o-sec-Butylphenol	89-72-5	5	30	---	---	---	---	X
p-tert-Butyltoluene	98-51-1	10	60	20	120	---	---	---

Substance	CAS No.	TWA		STEL		CEILING		Skin Designation
		ppm	mg/m ³	ppm	mg/m ³	ppm	mg/m ³	
Cadmium fume and dust (as Cd); see 1910.1027	7440-43-9							
Calcium carbonate	1317-65-3							
Total dust		---	15	---	---	---	---	---
Respirable fraction		---	5	---	---	---	---	---
Calcium cyanamide	156-62-7	---	0.5	---	---	---	---	---
Calcium hydroxide	1305-62-0	---	5	---	---	---	---	---
Calcium oxide	1305-78-8	---	5	---	---	---	---	---
Calcium silicate	1344-95-2							
Total dust		---	15	---	---	---	---	---
Respirable fraction		---	5	---	---	---	---	---
Calcium sulfate	7778-18-9							
Total dust		---	15	---	---	---	---	---
Respirable fraction		---	5	---	---	---	---	---
Camphor, synthetic	76-22-2	---	2	---	---	---	---	---
Caprolactam	105-60-2							
Dust		---	1	---	3	---	---	---
Vapor		5	20	10	40	---	---	---
Captafol (Difalatan [®])	2425-06-1	---	0.1	---	---	---	---	---
Captan	133-06-2	---	5	---	---	---	---	---
Carbaryl (Sevin [®])	63-25-2	---	5	---	---	---	---	---
Carbofuran (Furadan [®])	1563-66-2	---	0.1	---	---	---	---	---
Carbon black	1333-86-4	---	3.5	---	---	---	---	---
Carbon dioxide	124-38-9	10,000	18,000	30,000	54,000	---	---	---
Carbon disulfide	75-15-0	4	12	12	36	---	---	X
Carbon monoxide	630-08-0	35	40	---	---	200	229	---
Carbon tetrabromide	558-13-4	0.1	1.4	0.3	4	---	---	---
Carbon tetrachloride	56-23-5	2	12.6	---	---	---	---	---
Carbonyl fluoride	353-50-4	2	5	5	15	---	---	---
Catechol (Pyrocatechol)	120-80-9	5	20	---	---	---	---	X
Cellulose	9004-34-6							
Total dust		---	15	---	---	---	---	---
Respirable fraction		---	5	---	---	---	---	---
Cesium hydroxide	21351-79-1	---	2	---	---	---	---	---
Chlordane	57-74-9	---	0.5	---	---	---	---	X
Chlorinated camphene	8001-35-2	---	0.5	---	1	---	---	X
Chlorinated diphenyl oxide	55720-99-5	---	0.5	---	---	---	---	---
Chlorine	7782-50-5	0.5	1.5	1	3	---	---	---
Chlorine dioxide	10049-04-4	0.1	0.3	0.3	0.9	---	---	---
Chlorine trifluoride	7790-91-2	---	---	---	---	0.1	0.4	---
Chloroacetaldehyde	107-20-0	---	---	---	---	1	3	---
a-Chloroacetophenone (Phenacyl chloride)	532-27-4	0.05	0.3	---	---	---	---	---
Chloroacetyl chloride	79-04-9	0.05	0.2	---	---	---	---	---
Chlorobenzene	108-90-7	75	350	---	---	---	---	---
o-Chlorobenzylidene malononitrile	2698-41-1	---	---	---	---	0.05	0.4	X
Chlorobromomethane	74-97-5	200	1050	---	---	---	---	---
2-Chloro-1,3 butadiene; see b-Chloroprene								
Chlorodifluoromethane	75-45-6	1000	3500	---	---	---	---	---
Chlorodiphenyl (42% Chlorine) (PCB)	53469-21-9	---	1	---	---	---	---	X
Chlorodiphenyl (54% Chlorine) (PCB)	11097-69-1	---	0.5	---	---	---	---	X
1-Chloro, 2,3-epoxypropane; see Epichlorohydrin								
2-Chloroethanol; see Ethylene chlorohydrin								
Chloroethylene; see Vinyl Chloride								

Substance	CAS No.	TWA		STEL		CEILING		Skin Designation
		ppm	mg/m ³	ppm	mg/m ³	ppm	mg/m ³	
Chloroform (Trichloro- methane)	67-66-3	2	9.78	---	---	---	---	---
bis (Chloromethyl) ether; see 1910.1003	542-88-1							
Chloromethyl methyl ether; see 1910.1003	107-30-2							
1-Chloro-1-nitropropane	600-25-9	2	10	---	---	---	---	---
Chloropentafluoroethane	76-15-3	1000	6320	---	---	---	---	---
Chloropicrin	76-06-2	0.1	0.7	---	---	---	---	---
beta-Chloroprene	126-99-8	10	35	---	---	---	---	X
o-Chlorostyrene	2039-87-4	50	285	75	428	---	---	---
o-Chlorotoluene	95-49-8	50	250	---	---	---	---	---
2-Chloro-6-trichloro- methyl pyridine	1929-82-4							
Total dust		---	15	---	---	---	---	---
Respirable fraction		---	5	---	---	---	---	---
Chlorpyrifos	2921-88-2	---	0.2	---	---	---	---	X
Chromic acid and chromates (as CrO ₃)	Varies with compound	---	---	---	---	---	---	---
Chromium VI compounds -- see 1910.1026	Varies with compound							
Chromium, sol. chromic, chromous salts (as Cr)	7440-47-3	---	0.5	---	---	---	---	---
Chromium metal and insoluble salts	7440-47-3	---	1	---	---	---	---	---
Chrysene; see Coal tar pitch volatiles								
Clopidol	2971-90-6							
Total dust		---	15	---	---	---	---	---
Respirable fraction		---	5	---	---	---	---	---
Coal dust (less than 5% SiO ₂)								
Respirable fraction		---	2	---	---	---	---	---
Coal dust (greater than or equal to 5% SiO ₂), Respirable quartz fraction		---	0.1	---	---	---	---	---
Coal tar pitch volatiles (benzene soluble fraction), anthracene, BaP, phenanthrene, acridine, chrysene, pyrene	65966-93-2	---	0.2	---	---	---	---	---
Cobalt metal, dust and fume (as Co)	7440-48-4	---	0.05	---	---	---	---	---
Cobalt carbonyl (as Co)	10210-68-1	---	0.1	---	---	---	---	---
Cobalt hydrocarbonyl (as Co)	16842-03-8	---	0.1	---	---	---	---	---
Coke oven emissions; see 1910.1029	---							
Copper	7440-50-8							
Fume (as Cu)		---	0.1	---	---	---	---	---
Dusts and mists (as Cu)		---	1	---	---	---	---	---
Cotton dust (raw)	---		1	---	---	---	---	---

This 8-hour TWA applies to respirable dust as measured by a vertical elutriator cotton dust sampler or equivalent instrument. The time-weighted average applies to the cotton waste processing operations of waste recycling (sorting, blending, cleaning, and willowing) and garnetting. See also 1910.1043 for cotton dust limits applicable to other sectors.

Crag herbicide (Sesone)	136-78-7							
Total dust		---	10	---	---	---	---	---
Respirable fraction		---	5	---	---	---	---	---
Cresol, all isomers	1319-77-3:	5	22	---	---	---	---	X
Crotonaldehyde	123-73-9:	2	6	---	---	---	---	---
	4170-30-3							
Crufomate	299-86-5	---	5	---	---	---	---	---
Cumene	98-82-8	50	245	---	---	---	---	X
Cyanamide	420-04-2	---	2	---	---	---	---	---
Cyanides (as CN)	Varies with compound	---	5	---	---	---	---	---
Cyanogen	460-19-5	10	20	---	---	---	---	---
Cyanogen chloride	506-77-4	---	---	---	---	0.3	0.6	---

Substance	CAS No.	TWA		STEL		CEILING		Skin Designation
		ppm	mg/m ³	ppm	mg/m ³	ppm	mg/m ³	
Cyclohexane	110-82-7	300	1050	---	---	---	---	---
Cyclohexanol	108-93-0	50	200	---	---	---	---	X
Cyclohexanone	108-94-1	25	100	---	---	---	---	X
Cyclohexene	110-83-8	300	1015	---	---	---	---	---
Cyclohexylamine	108-91-8	10	40	---	---	---	---	---
Cyclonite	121-82-4	---	1.5	---	---	---	---	X
Cyclopentadiene	542-92-7	75	200	---	---	---	---	---
Cyclopentane	287-92-3	600	1720	---	---	---	---	---
Cyhexatin	13121-70-5	---	5	---	---	---	---	---
2,4-D (Dichloro- phenoxyacetic acid)	94-75-7	---	10	---	---	---	---	---
Decaborane	17702-41-9	0.05	0.3	0.15	0.9	---	---	X
Demeton (Systox [®])	8065-48-3	---	0.1	---	---	---	---	X
Dichlorodiphenyltri- chloroethane (DDT)	50-29-3	---	1	---	---	---	---	X
Dichlorvos (DDVP)	62-73-7	---	1	---	---	---	---	X
Diacetone alcohol (4-Hydroxy-4-methyl- 2-pentanone)	123-42-2	50	240	---	---	---	---	---
1,2-Diaminoethane; see Ethylenediamine								
Diazinon	333-41-5	---	0.1	---	---	---	---	X
Diazomethane	334-88-3	0.2	0.4	---	---	---	---	---
Diborane	19287-45-7	0.1	0.1	---	---	---	---	---
1,2-Dibromo-3-chloro- propane; see 1910.1044	96-12-8							
2-N-Dibutylamino- ethanol	102-81-8	2	14	---	---	---	---	---
Dibutyl phosphate	107-66-4	1	5	2	10	---	---	---
Dibutyl phthalate	88-74-2	---	5	---	---	---	---	---
Dichloroacetylene	7572-29-4	---	---	---	---	0.1	0.4	---
o-Dichlorobenzene	95-50-1	---	---	---	---	50	300	---
p-Dichlorobenzene	106-46-7	75	450	110	675	---	---	---
3,3'-Dichlorobenzidine; see 1910.1003	91-94-1							
Dichlorodifluoromethane	75-71-8	1000	4950	---	---	---	---	---
1,3-Dichloro-5,5- dimethylhydantoin	118-52-5	---	0.2	---	0.4	---	---	---
1,1-Dichloroethane	75-34-3	100	400	---	---	---	---	---
1,2-Dichloroethylene	540-59-0	200	790	---	---	---	---	---
Dichloroethyl ether	111-44-4	5	30	10	60	---	---	X
Dichloromethane; see Methylene chloride								
Dichloromonofluoro- methane	75-43-4	10	40	---	---	---	---	---
1,1-Dichloro-1- nitroethane	594-72-9	2	10	---	---	---	---	---
1,2-Dichloropropane; see Propylene dichloride								
1,3-Dichloropropene	542-75-6	1	5	---	---	---	---	X
2,2-Dichloropropionic acid	75-99-0	1	6	---	---	---	---	---
Dichlorotetrafluoroethane	76-14-2	1000	7000	---	---	---	---	---
Dicrotophos	141-66-2	---	0.25	---	---	---	---	X
Dicyclopentadiene	77-73-6	5	30	---	---	---	---	---
Dicyclopentadienyl iron Total dust	102-54-5	---	10	---	---	---	---	---
Respirable fraction		---	5	---	---	---	---	---
Dieldrin	60-57-1	---	0.25	---	---	---	---	X
Diethanolamine	111-42-2	3	15	---	---	---	---	---
Diethylamine	109-89-7	10	30	25	75	---	---	---
2-Diethylaminoethanol	100-37-8	10	50	---	---	---	---	X
Diethylene triamine	111-40-0	1	4	---	---	---	---	---
Diethyl ether; see Ethyl ether								
Diethyl ketone	96-22-0	200	705	---	---	---	---	---
Diethyl phthalate	84-66-2	---	5	---	---	---	---	---
Difluorodibromomethane	75-61-6	100	860	---	---	---	---	---

Substance	CAS No.	TWA		STEL		CEILING		Skin Designation
		ppm	mg/m ³	ppm	mg/m ³	ppm	mg/m ³	
Diglycidyl ether (DGE)	2238-07-5	0.1	0.5	---	---	---	---	---
Dihydroxybenzene; see Hydroquinone								
Diisobutyl ketone	108-83-8	25	150	---	---	---	---	---
Diisopropylamine	108-18-9	5	20	---	---	---	---	X
4-Dimethylaminoazo- benzene; see 1910.1003	60-11-7							
Dimethoxymethane; see Methylal								
Dimethyl acetamide	127-19-5	10	35	---	---	---	---	X
Dimethylamine	124-40-3	10	18	---	---	---	---	---
Dimethylaminobenzene; see Xylidine								
Dimethylaniline (N, N-Dimethylaniline)	121-69-7	5	25	10	50	---	---	X
Dimethylbenzene; see Xylene								
Dimethyl-1,2-dibromo- 2,2-dichloroethyl phosphate	300-76-5	---	3	---	---	---	---	X
Dimethylformamide	68-12-2	10	30	---	---	---	---	X
2,6-Dimethyl-4-hep- tanone; see Diisobutyl ketone								
1,1-Dimethylhydrazine	57-14-7	0.5	1	---	---	---	---	X
Dimethylphthalate	131-11-3	---	5	---	---	---	---	---
Dimethyl sulfate	77-78-1	0.1	0.5	---	---	---	---	X
Dinitolmide (3,5- Dinitro-o-toluamide)	148-01-6	---	5	---	---	---	---	---
Dinitrobenzene (all isomers)	528-29-0 99-65-0 100-25-4	---	1	---	---	---	---	X
Dinitro-o-cresol	534-52-1	---	0.2	---	---	---	---	X
Dinitrotoluene	25321-14-6	---	1.5	---	---	---	---	X
Dioxane (Diethylene dioxide)	123-91-1	25	90	---	---	---	---	X
Dioxathion (Delnav)	78-34-2	---	0.2	---	---	---	---	X
Diphenyl (Biphenyl)	92-52-4	0.2	1	---	---	---	---	---
Diphenylamine	122-39-4	---	10	---	---	---	---	---
Diphenylmethane diisocyanate; see Methylene bisphenyl isocyanate								
Dipropylene glycol methyl ether	34590-94-8	100	600	150	900	---	---	X
Dipropyl ketone	123-19-3	50	235	---	---	---	---	---
Diquat	86-00-7	---	0.5	---	---	---	---	---
Di-sec octyl phthalate (Di-2-ethylhexyl- phthalate)	117-81-7	---	5	---	10	---	---	---
Disulfiram	97-77-8	---	2	---	---	---	---	---
Disulfoton	298-04-4	---	0.1	---	---	---	---	X
2,6-Di-tert-butyl-p- cresol	128-37-0	---	10	---	---	---	---	---
Diuron	330-54-1	---	10	---	---	---	---	---
Divinyl benzene	1321-74-0	10	50	---	---	---	---	---
Emery Total dust	12415-34-8	---	10	---	---	---	---	---
Respirable fraction		---	5	---	---	---	---	---
Endosulfan	115-29-7	---	0.1	---	---	---	---	X
Endrin	72-20-8	---	0.1	---	---	---	---	X
Epichlorohydrin	106-89-8	2	8	---	---	---	---	X
EPN	2104-64-5	---	0.5	---	---	---	---	X
1,2-Epoxypropane; see Propylene oxide								
2,3-Epoxy-1-propanol; see Glycidol								

Substance	CAS No.	TWA		STEL		CEILING		Skin Designation
		ppm	mg/m ³	ppm	mg/m ³	ppm	mg/m ³	
Ethanedithiol; see Ethyl mercaptan								
Ethanolamine	141-43-5	3	8	6	15	---	---	---
Ethion	563-12-2	---	0.4	---	---	---	---	X
2-Ethoxyethanol (Cellosolve)	110-80-5	200	740	---	---	---	---	X
2-Ethoxyethyl acetate (Cellosolve acetate)	111-15-9	100	540	---	---	---	---	X
Ethyl acetate	141-78-6	400	1400	---	---	---	---	
Ethyl acrylate	140-88-5	5	20	25	100	---	---	X
Ethyl alcohol (Ethanol)	64-17-5	1000	1900	---	---	---	---	---
Ethylamine	75-04-7	10	18	---	---	---	---	---
Ethyl amyl ketone (5-Methyl-3-heptanone)	541-85-5	25	130	---	---	---	---	---
Ethyl benzene	100-41-4	100	435	125	545	---	---	---
Ethyl bromide	74-96-4	200	890	250	1110	---	---	---
Ethyl butyl ketone (3-Heptanone)	106-35-4	50	230	---	---	---	---	---
Ethyl chloride	75-00-3	1000	2600	---	---	---	---	---
Ethyl ether	60-29-7	400	1200	500	1500	---	---	---
Ethyl formate	109-94-4	100	300	---	---	---	---	---
Ethyl mercaptan	75-08-1	0.5	1	---	---	---	---	---
Ethyl silicate	78-10-4	10	85	---	---	---	---	---
Ethylene chlorohydrin	107-07-3	---	---	---	---	1	3	X
Ethylenediamine	107-15-3	10	25	---	---	---	---	---
Ethylene dibromide	106-93-4	20		30 (5 min)		---	50	---
Ethylene dichloride	107-06-2	1	4	2	8	---	---	---
Ethylene glycol	107-21-1	---	---	---	---	50	125	---
Ethylene glycol dinitrate	628-96-6	---	---	---	0.1	---	---	X
Ethylene glycol methyl acetate; see Methyl cellosolve acetate								
Ethyleneimine; see 1910.1003	151-56-4							
Ethylene oxide; see 1910.1047	75-21-8							
Ethylidene chloride; see 1,1-Dichloroethane								
Ethylidene norbornene	16219-75-3	---	---	---	---	5	25	---
N-Ethylmorpholine	100-74-3	5	23	---	---	---	---	X
Fenamiphos	22224-92-6	---	0.1	---	---	---	---	X
Fensulfothion (Dasanit)	115-90-2	---	0.1	---	---	---	---	---
Fenthion	55-38-9	---	0.2	---	---	---	---	X
Ferbam	14484-64-1							
Total dust		---	10	---	---	---	---	---
Respirable fraction			5					
Ferrovandium dust	12604-58-9	---	1	---	3	---	---	---
Fluorides (as F)	Varies with compound		2.5	---	---	---	---	---
Fluorine	7782-41-4	0.1	0.2	---	---	---	---	---
Fluorotrichloromethane (Trichlorofluoro- methane)	75-69-4	---	---	---	---	1000	5600	---
Fonofos	944-22-9	---	0.1	---	---	---	---	X
Formaldehyde; see 1910.1048								
Formamide	75-12-7	20	30	30	45	---	---	---
Formic acid	64-18-6	5	9	---	---	---	---	---
Furfural	98-01-1	2	8	---	---	---	---	X
Furfuryl alcohol	98-00-0	10	40	15	60	---	---	X
Gasoline	8006-61-9	300	900	500	1500	---	---	---
Germanium tetrahydride	7782-65-2	0.2	0.6	---	---	---	---	---
Glutaraldehyde	111-30-8	---	---	---	---	0.2	0.8	---
Glycerin (mist)	56-81-5							
Total dust		---	10	---	---	---	---	---
Respirable fraction		---	5	---	---	---	---	---
Glycidol	556-52-5	25	75	---	---	---	---	---
Glycol monethyl ether; see 2-Ethoxyethanol								
Grain dust (oat, wheat, barley)		---	10	---	---	---	---	---

Substance	CAS No.	TWA		STEL		CEILING		Skin Designation
		ppm	mg/m ³	ppm	mg/m ³	ppm	mg/m ³	
Graphite, natural Respirable dust	7782-42-5	---	2.5	---	---	---	---	---
Graphite, synthetic Total dust		---	10	---	---	---	---	---
Respirable fraction		---	5	---	---	---	---	---
Guthion®; see Azinphos methyl								
Gypsum Total dust	13397-24-5	---	15	---	---	---	---	---
Respirable fraction		---	5	---	---	---	---	---
Hafnium	7440-58-6	---	0.5	---	---	---	---	---
Heptachlor	76-44-8	---	0.5	---	---	---	---	X
Heptane (n-Heptane)	142-82-5	400	1600	500	2000	---	---	---
Hexachlorobutadiene	87-68-3	0.02	0.24	---	---	---	---	---
Hexachlorocyclo- pentadiene	77-47-4	0.01	0.1	---	---	---	---	---
Hexachloroethane	67-72-1	1	10	---	---	---	---	X
Hexachloronaphthalene	1335-87-1	---	0.2	---	---	---	---	X
Hexafluoroacetone	684-16-2	0.1	0.7	---	---	---	---	X
n-Hexane	110-54-3	50	180	---	---	---	---	---
Hexane isomers	Varies	500	1800	1000	3600	---	---	---
2-Hexanone (Methyl n-butyl ketone)	591-78-6	5	20	---	---	---	---	---
Hexone (Methyl isobutyl ketone)	108-10-1	50	205	75	300	---	---	---
sec-Hexyl acetate	108-84-9	50	300	---	---	---	---	---
Hexylene glycol	107-41-5	---	---	---	---	25	125	---
Hydrazine	302-01-2	0.1	0.1	---	---	---	---	X
Hydrogenated terphenyls	61788-32-7	0.5	5	---	---	---	---	---
Hydrogen bromide	10035-10-6	---	---	---	---	3	10	---
Hydrogen chloride	7647-01-0	---	---	---	---	5	7	---
Hydrogen cyanide	74-90-8	---	---	4.7	5	---	---	X
Hydrogen fluoride (as F)	7664-39-3	3	---	6	---	---	---	---
Hydrogen peroxide	7722-84-1	1	1.4	---	---	---	---	---
Hydrogen selenide (as Se)	7783-07-5	0.05	0.2	---	---	---	---	---
Hydrogen sulfide	7783-06-4	10	14	15	21	---	---	---
Hydroquinone	123-31-9	---	2	---	---	---	---	---
2-Hydroxypropyl acrylate	999-61-1	0.5	3	---	---	---	---	X
Indene	95-13-6	10	45	---	---	---	---	---
Indium and compounds (as In)	7440-74-6	---	0.1	---	---	---	---	---
Iodine	7553-56-2	---	---	---	---	0.1	1	---
Iodoform	75-47-8	0.6	10	---	---	---	---	---
Iron oxide fume Total particulate	1309-37-1	---	10	---	---	---	---	---
Iron pentacarbonyl (as Fe)	13463-40-6	0.1	0.8	0.2	1.6	---	---	---
Iron salts (soluble) (as Fe)	Varies	---	1	---	---	---	---	---
Isoamyl acetate	123-92-2	100	525	---	---	---	---	---
Isoamyl alcohol (primary and secondary)	123-51-3	100	360	125	450	---	---	---
Isobutyl acetate	110-19-0	150	700	---	---	---	---	---
Isobutyl alcohol	78-83-1	50	150	---	---	---	---	---
Isooctyl alcohol	26952-21-6	50	270	---	---	---	---	X
Isophorone	78-59-1	4	23	---	---	---	---	---
Isophorone diisocyanate	4098-71-9	0.005	---	0.02	---	---	---	X
2-Isopropoxyethanol	109-59-1	25	105	---	---	---	---	---
Isopropyl acetate	108-21-4	250	950	310	1185	---	---	---
Isopropyl alcohol	67-63-0	400	980	500	1225	---	---	---
Isopropylamine	75-31-0	5	12	10	24	---	---	---
N-Isopropylaniline	768-52-5	2	10	---	---	---	---	X
Isopropyl ether	108-20-3	500	2100	---	---	---	---	---

Substance	CAS No.	TWA		STEL		CEILING		Skin Designation
		ppm	mg/m ³	ppm	mg/m ³	ppm	mg/m ³	
Isopropyl glycidyl ether (IGE)	4016-14-2	50	240	75	360	---	---	---
Kaolin								
Total dust	---	---	10	---	---	---	---	---
Respirable fraction	---	---	5	---	---	---	---	---
Ketene	463-51-4	0.5	0.9	1.5	3	---	---	---
Lead inorganic (as Pb); see 1910.1025	7439-92-1							
Limestone	1317-65-3							
Total dust	---	---	15	---	---	---	---	---
Respirable fraction	---	---	5	---	---	---	---	---
Lindane	58-89-9	---	0.5	---	---	---	---	X
Lithium hydride	7580-67-8	---	0.025	---	---	---	---	---
L.P.G. (Liquified petroleum gas)	68476-85-7	1000	1800	---	---	---	---	---
Magnesite	546-93-0							
Total dust	---	---	15	---	---	---	---	---
Respirable fraction	---	---	5	---	---	---	---	---
Magnesium oxide fume	1309-48-4							
Total dust	---	---	10	---	---	---	---	---
Respirable fraction	---	---	5	---	---	---	---	---
Malathion	121-75-5							
Total dust	---	---	10	---	---	---	---	X
Respirable fraction	---	---	5	---	---	---	---	---
Maleic anhydride	108-31-6	0.25	1	---	---	---	---	---
Manganese compounds (as Mn)	7439-96-5	---	---	---	---	---	5	---
Manganese fume (as Mn)	7439-96-5	---	1	---	3	---	---	---
Manganese cyclopentadienyl tricarbonyl (as Mn)	12079-65-1	---	0.1	---	---	---	---	X
Manganese tetroxide (as Mn)	1317-35-7	---	1	---	---	---	---	---
Marble	1317-65-3							
Total dust	---	---	15	---	---	---	---	---
Respirable fraction	---	---	5	---	---	---	---	---
Mercury (aryl and inorganic) (as Hg)	7439-97-6	---	---	---	---	---	0.1	X
Mercury (organo) alkyl compounds (as Hg)	7439-97-6	---	0.01	---	0.03	---	---	X
Mercury (vapor) (as Hg)	7439-97-6	---	0.05	---	---	---	---	X
Mesityl oxide	141-79-7	15	60	25	100	---	---	---
Methacrylic acid	79-41-4	20	70	---	---	---	---	X
Methanethiol; see Methyl mercaptan								
Methomyl (Lannate)	16752-77-5	---	2.5	---	---	---	---	---
Methoxychlor	72-43-5							
Total dust	---	---	10	---	---	---	---	---
Respirable fraction	---	---	5	---	---	---	---	---
2-Methoxyethanol; see Methyl cellosolve								
4-Methoxyphenol	150-76-5	---	5	---	---	---	---	---
Methyl acetate	79-20-9	200	610	250	760	---	---	---
Methyl acetylene (Propyne)	74-99-7	1000	1650	---	---	---	---	---
Methyl acetylene propadiene mixture (MAPP)	---	1000	1800	1250	2250	---	---	---
Methyl acrylate	96-33-3	10	35	---	---	---	---	X
Methylacrylonitrile	126-98-7	1	3	---	---	---	---	X
Methylal (Dimethoxymethane)	109-87-5	1000	3100	---	---	---	---	---

Substance	CAS No.	TWA		STEL		CEILING		Skin Designation
		ppm	mg/m ³	ppm	mg/m ³	ppm	mg/m ³	
Methyl alcohol	67-56-1	200	260	250	325	---	---	X
Methylamine	74-89-5	10	12	---	---	---	---	---
Methyl amyl alcohol; see Methyl Isobutyl carbinol								
Methyl n-amyl ketone	110-43-0	100	465	---	---	---	---	---
Methyl bromide	74-83-9	5	20	---	---	---	---	X
Methyl butyl ketone; see 2-Hexanone								
Methyl cellosolve (2-Methoxyethanol)	109-86-4	25	80	---	---	---	---	X
Methyl cellosolve acetate (2-Methoxyethyl acetate)	110-49-6	25	120	---	---	---	---	X
Methyl chloride	74-87-3	50	105	100	210	---	---	---
Methyl chloroform (1,1,1-Trichloroethane)	71-55-6	350	1900	450	2450	---	---	---
Methyl 2-cyanoacrylate	137-05-3	2	8	4	16	---	---	---
Methylcyclohexane	108-87-2	400	1600	---	---	---	---	---
Methylcyclohexanol	25639-42-3	50	235	---	---	---	---	---
o-Methylcyclohexanone	583-60-8	50	230	75	345	---	---	X
Methylcyclopentadienyl manganese tricarbonyl (as Mn)	12108-13-3	---	0.2	---	---	---	---	X
Methyl demeton	8022-00-2	---	0.5	---	---	---	---	X
4,4-Methylene bis (2-chloroaniline) (MBOCA)	101-14-4	0.02	0.22	---	---	---	---	X
Methylene bis (4-cyclohexyliso- cyanate)	5124-30-1	---	---	---	---	0.01	0.11	---
Methylene chloride; see 1910.1052	75-09-2							
Methyl ethyl ketone (MEK); see 2-Butanone								
Methyl ethyl ketone peroxide (MEKP)	1338-23-4	---	---	---	---	0.7	5	---
Methyl formate	107-31-3	100	250	150	375	---	---	---
Methyl hydrazine (Monomethyl hydrazine)	60-34-4	---	---	---	---	0.2	0.35	X
Methyl iodide	74-88-4	2	10	---	---	---	---	X
Methyl isoamyl ketone	110-12-3	50	240	---	---	---	---	---
Methyl isobutyl carbinol	108-11-2	25	100	40	165	---	---	X
Methyl isobutyl ketone; see Hexone								
Methyl isocyanate	624-83-9	0.02	0.05	---	---	---	---	X
Methyl isopropyl ketone	563-80-4	200	705	---	---	---	---	---
Methyl mercaptan	74-93-1	0.5	1	---	---	---	---	---
Methyl methacrylate	80-62-6	100	410	---	---	---	---	---
Methyl parathion	298-00-0	---	0.2	---	---	---	---	X
Methyl propyl ketone; see 2-Pentanone								
Methyl silicate	681-84-5	1	6	---	---	---	---	---
alpha-Methyl styrene	98-83-9	50	240	100	485	---	---	---
Methylene bisphenyl isocyanate (MDI)	101-68-8	---	---	---	---	0.02	0.2	---
Metribuzin	21087-64-9	---	5	---	---	---	---	---
Mica; see Silicates								
Molybdenum (as Mo)	7439-98-7							
Soluble compounds		---	5	---	---	---	---	---
Insoluble compounds								
Total dust		---	10	---	---	---	---	---
Respirable fraction		---	5	---	---	---	---	---
Monocrotophos (Azodrin [®])	6923-22-4	---	0.25	---	---	---	---	---
Monomethyl aniline	100-61-8	0.5	2	---	---	---	---	X

Substance	CAS No.	TWA		STEL		CEILING		Skin Designation
		ppm	mg/m ³	ppm	mg/m ³	ppm	mg/m ³	
Morpholine	110-91-8	20	70	30	105	---	---	X
Naphtha (Coal tar)	8030-30-6	100	400	---	---	---	---	---
Naphthalene	91-20-3	10	50	15	75	---	---	---
alpha-Naphthylamine; see 1910.1003	134-32-7							
beta-Naphthylamine; see 1910.1003	91-59-8							
Nickel carbonyl (as Ni)	13463-39-3	0.001	0.007	---	---	---	---	---
Nickel, metal and insoluble compounds (as Ni)	7440-02-0	---	1	---	---	---	---	---
Nickel, soluble compounds (as Ni)	7440-02-0	---	0.1	---	---	---	---	---
Nicotine	54-11-5	---	0.5	---	---	---	---	X
Nitric acid	7697-37-2	2	5	4	10	---	---	---
Nitric oxide	10102-43-9	25	30	---	---	---	---	---
p-Nitroaniline	100-01-6	---	3	---	---	---	---	X
Nitrobenzene	98-95-3	1	5	---	---	---	---	X
p-Nitrochlorobenzene	100-00-5	---	1	---	---	---	---	X
4-Nitrodiphenyl; see 1910.1003	92-93-3							
Nitroethane	79-24-3	100	310	---	---	---	---	---
Nitrogen dioxide	10102-44-0	---	---	1	1.8	---	---	---
Nitrogen trifluoride	778-54-2	10	29	---	---	---	---	---
Nitroglycerin	55-63-0	---	---	---	0.1	---	---	X
Nitromethane	75-52-5	100	250	---	---	---	---	---
1-Nitropropane	108-03-2	25	90	---	---	---	---	---
2-Nitropropane	79-46-9	10	35	---	---	---	---	---
N-Nitrosodimethyl- amine; see 1910.1003	62-79-9							
Nitrotoluene o-isomer	88-72-2	2	11	---	---	---	---	X
m-isomer	99-08-1	2	11	---	---	---	---	X
p-isomer	99-99-0	2	11	---	---	---	---	X
Nitrotrichloromethane; see Chloropicrin								
Nonane	111-84-2	200	1050	---	---	---	---	---
Octachloronaphthalene	2234-13-1	---	0.1	---	0.3	---	---	X
Octane	111-65-9	300	1450	375	1800	---	---	---
Oil mist, mineral	8012-95-1	---	5	---	---	---	---	---
Osmium tetroxide (as Os)	20816-12-0	0.0002	0.002	0.0006	0.006	---	---	---
Oxalic acid	144-62-7	---	1	---	2	---	---	---
Oxygen difluoride	7783-41-7	---	---	---	---	0.05	0.1	---
Ozone	10028-15-6	0.1	0.2	0.3	0.6	---	---	---
Paraffin wax fume	8002-74-2	---	2	---	---	---	---	---
Paraquat, respirable dust	1910-42-5 2074-50-2							
	4685-14-7	---	0.1	---	---	---	---	X
Parathion	56-38-2	---	0.1	---	---	---	---	X
Particulates not otherwise regulated	---							
Total dust	---	---	15	---	---	---	---	---
Respirable fraction	---	---	5	---	---	---	---	---
Pentaborane	19624-22-7	0.005	0.01	0.015	0.03	---	---	---
Pentachloronaphthalene	1321-64-8	---	0.5	---	---	---	---	X
Pentachlorophenol	87-86-5	---	0.5	---	---	---	---	X
Pentaerythritol Total dust	115-77-5							
Respirable fraction	---	---	10	---	---	---	---	---
	---	---	5	---	---	---	---	---
Pentane	109-66-0	600	1800	750	2250	---	---	---
2-Pentanone (Methyl propyl ketone)	107-87-9	200	700	250	875	---	---	---
Perchloroethylene (Tetrachloroethylene)	127-18-4	25	170	---	---	---	---	---
Perchloromethyl mercaptan	594-42-3	0.1	0.8	---	---	---	---	---

Substance	CAS No.	TWA		STEL		CEILING		Skin Designation
		ppm	mg/m ³	ppm	mg/m ³	ppm	mg/m ³	
Perchloryl fluoride	7616-94-6	3	14	6	28	---	---	---
Perlite								
Total dust		---	15	---	---	---	---	---
Respirable fraction		---	5	---	---	---	---	---
Petroleum distillates (Naphtha)(Rubber Solvent)		400	1600	---	---	---	---	---
Phenol	108-95-2	5	19	---	---	---	---	X
Phenothiazine	92-84-2	---	5	---	---	---	---	X
p-Phenylene diamine	106-50-3	---	0.1	---	---	---	---	X
Phenyl ether, vapor	101-84-8	1	7	---	---	---	---	---
Phenyl ether-biphenyl mixture, vapor	---	1	7	---	---	---	---	---
Phenylethylene; see Styrene								
Phenyl glycidyl ether (PGE)	122-60-1	1	6	---	---	---	---	---
Phenyldiazine	100-63-0	5	20	10	45	---	---	X
Phenyl mercaptan	108-98-5	0.5	2	---	---	---	---	---
Phenylphosphine	638-21-1	---	---	---	---	0.05	0.25	---
Phorate	298-02-2	---	0.05	---	0.2	---	---	X
Phosdrin (Mevinphos [®])	7786-34-7	0.01	0.1	0.03	0.3	---	---	X
Phosgene (Carbonyl chloride)	75-44-5	0.1	0.4	---	---	---	---	---
Phosphine	7803-51-2	0.3	0.4	1	1	---	---	---
Phosphoric acid	7664-38-2	---	1	---	3	---	---	---
Phosphorus (yellow)	7723-14-0	---	0.1	---	---	---	---	---
Phosphorus oxychloride	10025-87-3	0.1	0.6	---	---	---	---	---
Phosphorus penta- chloride	10026-13-8	---	1	---	---	---	---	---
Phosphorus pentasulfide	1314-80-3	---	1	---	3	---	---	---
Phosphorus trichloride	7719-12-2	0.2	1.5	0.5	3	---	---	---
Phthalic anhydride	85-44-9	1	6	---	---	---	---	---
m-Phthalodinitrile	626-17-5	---	5	---	---	---	---	---
Pictoram	1918-02-1							
Total dust		---	10	---	---	---	---	---
Respirable fraction		---	5	---	---	---	---	---
Picric acid	88-89-1	---	0.1	---	---	---	---	X
Piperazine dihydro- chloride	142-64-3	---	5	---	---	---	---	---
Pindone (2-Pivalyl-1,3- Indandione)	83-26-1	---	0.1	---	---	---	---	---
Plaster of Paris	26499-65-0							
Total dust		---	15	---	---	---	---	---
Respirable fraction		---	5	---	---	---	---	---
Platinum (as Pt)	7440-06-4							
Metal		---	1	---	---	---	---	---
Soluble salts		---	0.002	---	---	---	---	---
Portland cement	65997-15-1							
Total dust		---	10	---	---	---	---	---
Respirable fraction		---	5	---	---	---	---	---
Potassium hydroxide	1310-58-3	---	---	---	---	---	2	---
Propane	74-98-6	1000	1800	---	---	---	---	---
Propargyl alcohol	107-19-7	1	2	---	---	---	---	X
beta-Propiolactone; see 1910.1003	57-57-8							
Propionic acid	79-09-4	10	30	---	---	---	---	---
Propoxur (Baygon)	114-26-1	---	0.5	---	---	---	---	---
n-Propyl acetate	109-60-4	200	840	250	1050	---	---	---
n-Propyl alcohol	71-23-8	200	500	250	625	---	---	---
n-Propyl nitrate	627-13-4	25	105	40	170	---	---	---
Propylene dichloride	78-87-5	75	350	110	510	---	---	---
Propylene glycol dinitrate	6423-43-4	0.05	0.3	---	---	---	---	---
Propylene glycol monomethyl ether	107-98-2	100	360	150	540	---	---	---

Substance	CAS No.	TWA		STEL		CEILING		Skin Designation
		ppm	mg/m ³	ppm	mg/m ³	ppm	mg/m ³	
Propylene imine	75-55-8	2	5	---	---	---	---	X
Propylene oxide	75-56-9	20	50	---	---	---	---	---
Propyne; see Methyl acetylene								
Pyrethrum	8003-34-7	---	5	---	---	---	---	---
Pyridine	110-86-1	5	15	---	---	---	---	---
Quinone	106-51-4	0.1	0.4	---	---	---	---	---
Resorcinol	108-46-3	10	45	20	90	---	---	---
Rhodium (as Rh), metal fume and insoluble compounds	7440-16-6	---	0.1	---	---	---	---	---
Rhodium (as Rh), soluble compounds	7440-16-6	---	0.001	---	---	---	---	---
Ronnel	299-84-3	---	10	---	---	---	---	---
Rosin core solder pyrolysis products, as formaldehyde	---	---	0.1	---	---	---	---	---
Rotenone	83-79-4	---	5	---	---	---	---	---
Rouge								
Total dust		---	10	---	---	---	---	---
Respirable fraction		---	5	---	---	---	---	---
Selenium compounds (as Se)	7782-49-2	---	0.2	---	---	---	---	---
Selenium hexafluoride (as Se)	7783-79-1	0.05	0.4	---	---	---	---	---
Silica, amorphous, precipitated and gel	112926-00-8	---	6	---	---	---	---	---
Silica, amorphous, diatomaceous earth, containing less than 1% crystalline silica	61790-53-2	---	6	---	---	---	---	---
Silica, crystalline cristobalite, respirable dust	14464-46-1	---	0.05	---	---	---	---	---
Silica, crystalline quartz, respirable dust	14808-60-7	---	0.1	---	---	---	---	---
Silica, crystalline tripoli (as quartz), respirable dust	1317-95-9	---	0.1	---	---	---	---	---
Silica, crystalline tridymite, respirable dust	15468-32-3	---	0.05	---	---	---	---	---
Silica, fused, respirable dust	60676-86-0	---	0.1	---	---	---	---	---
Silicates (less than 1% crystalline silica)								
Mica, respirable dust	12001-26-2	---	3	---	---	---	---	---
Soapstone, Total dust	---	---	6	---	---	---	---	---
Respirable dust	---	---	3	---	---	---	---	---
Talc (containing asbestos): use asbestos limit see 1910.1001		---						
Talc (containing no asbestos), respirable dust	14807-96-6	---	2	---	---	---	---	---
Tremolite use asbestos limit see 1910.1001								
Silicon	7440-21-3							
Total dust		---	10	---	---	---	---	---
Respirable fraction		---	5	---	---	---	---	---
Silicon carbide	409-21-2							
Total dust		---	10	---	---	---	---	---
Respirable fraction		---	5	---	---	---	---	---
Silicon tetrahydride	7803-62-5	5	7	---	---	---	---	---

Substance	CAS No.	TWA		STEL		CEILING		Skin Designation
		ppm	mg/m ³	ppm	mg/m ³	ppm	mg/m ³	
Silver, metal and soluble compounds (as Ag)	7440-22-4	---	0.01	---	---	---	---	---
Soapstone; see Silicates								
Sodium azide (as HN ₃)	26628-22-8	---	---	---	---	0.1	---	X
(as NaN ₃)		---	---	---	---	---	0.3	X
Sodium bisulfite	7631-90-5	---	5	---	---	---	---	---
Sodium fluoroacetate	62-74-8	---	0.05	---	0.15	---	---	X
Sodium hydroxide	1310-73-2	---	---	---	---	---	2	---
Sodium metabisulfite	7681-57-4	---	5	---	---	---	---	---
Starch	9005-25-8							
Total dust		---	15	---	---	---	---	---
Respirable fraction		---	5	---	---	---	---	---
Stibine	7803-52-3	0.1	0.5	---	---	---	---	---
Stoddard solvent	8052-41-3	100	525	---	---	---	---	---
Strychnine	57-24-9	---	0.15	---	---	---	---	---
Styrene	100-42-5	50	215	100	425	---	---	---
Subtiisins (Proteolytic enzymes) sample 600-800 lpm for at least 60 minutes	9014-01-1	---	---	---	0.00006	---	---	---
Sucrose	57-50-1							
Total dust		---	15	---	---	---	---	---
Respirable fraction		---	5	---	---	---	---	---
Sulfur dioxide	7446-09-5	2	5	5	13	---	---	---
Sulfur hexafluoride	2551-62-4	1000	6000	---	---	---	---	---
Sulfuric acid	7664-93-9	---	1	---	---	---	---	---
Sulfur monochloride	10025-67-9	---	---	---	---	1	6	---
Sulfur pentafluoride	5714-22-7	---	---	---	---	0.01	0.1	---
Sulfur tetrafluoride	7783-60-0	---	---	---	---	0.1	0.4	---
Sulfuryl fluoride	2699-79-8	5	20	10	40	---	---	---
Sulprofos	35400-43-2	---	1	---	---	---	---	---
Systox [®] , see Demeton								
2,4,5-T	93-76-5	---	10	---	---	---	---	---
Talc; see Silicates								
Tantalum, metal and oxide dust	7440-25-7	---	5	---	---	---	---	---
TEDP (Sulfotep)	3689-24-5	---	0.2	---	---	---	---	X
Tellurium and compounds (as Te)	13494-80-9	---	0.1	---	---	---	---	---
Tellurium hexafluoride (as Te)	7783-80-4	0.02	0.2	---	---	---	---	---
Temephos	3383-96-8							
Total dust		---	10	---	---	---	---	---
Respirable fraction		---	5	---	---	---	---	---
TEPP	107-49-3	---	0.05	---	---	---	---	X
Terphenyls	26140-60-3	---	---	---	---	0.5	5	---
1,1,1,2-Tetrachloro-2,2-difluoroethane	76-11-9	500	4170	---	---	---	---	---
1,1,2,2-Tetrachloro-1,2-difluoroethane	76-12-0	500	4170	---	---	---	---	---
1,1,2,2-Tetrachloroethane	79-34-5	1	7	---	---	---	---	X
Tetrachloroethylene; see Perchloroethylene								
Tetrachloromethane; see Carbon tetrachloride								
Tetrachloronaphthalene	1335-88-2	---	2	---	---	---	---	X
Tetraethyl lead (as Pb)	78-00-2	---	0.075	---	---	---	---	X
Tetrahydrofuran	109-99-9	200	590	250	735	---	---	---
Tetramethyl lead (as Pb)	75-74-1	---	0.075	---	---	---	---	X
Tetramethyl succinonitrile	3333-52-6	0.5	3	---	---	---	---	X
Tetranitromethane	509-14-8	1	8	---	---	---	---	--

Substance	CAS No.	TWA		STEL		CEILING		Skin Designation
		ppm	mg/m ³	ppm	mg/m ³	ppm	mg/m ³	
Tetrasodium pyrophosphate	7722-88-5	---	5	---	---	---	---	---
Tetryl (2,4,6-Trinitrophenylmethyl-nitramine)	479-45-8	---	1.5	---	---	---	---	X
Thallium, soluble compounds (as Tl)	7440-28-0	---	0.1	---	---	---	---	X
4,4'-Thiobis (6-tert, Butyl-m-cresol)	96-69-5	---	10	---	---	---	---	---
Total dust		---	5	---	---	---	---	---
Respirable fraction		---	4	---	---	---	---	X
Thioglycolic acid	68-11-1	---	---	---	---	1	5	---
Thionyl chloride	7719-09-7	---	---	---	---	---	---	---
Thiram	137-26-8	---	5	---	---	---	---	---
Tin, inorganic compounds (except oxides) (as Sn)	7440-31-5	---	2	---	---	---	---	---
Tin, organic compounds (as Sn)	7440-31-5	---	0.1	---	---	---	---	X
Tin oxide (as Sn)	21651-19-4	---	2	---	---	---	---	---
Titanium dioxide	13463-67-7	---	10	---	---	---	---	---
Total dust		---	5	---	---	---	---	---
Respirable fraction		---	375	150	560	---	---	---
Toluene	108-88-3	100				---	---	---
Toluene-2,4-diisocyanate (TDI)	584-85-9	0.005	0.04	0.02	0.15	---	---	---
m-Toluidine	108-44-1	2	9	---	---	---	---	X
o-Toluidine	95-53-4	5	22	---	---	---	---	X
p-Toluidine	106-49-0	2	9	---	---	---	---	X
Toxaphene; see Chlorinated camphene								
Tremolite; see Silicates								
Tributyl phosphate	126-73-8	0.2	2.5	---	---	---	---	---
Trichloroacetic acid	76-03-9	1	7	---	---	---	---	---
1,2,4-Trichlorobenzene	120-82-1	---	---	---	---	5	40	---
1,1,1-Trichloroethane; see Methyl chloroform								
1,1,2-Trichloroethane	79-00-5	10	45	---	---	---	---	X
Trichloroethylene	79-01-6	50	270	200	1080	---	---	---
Trichloromethane; see Chloroform								
Trichloronaphthalene	1321-65-9	---	5	---	---	---	---	X
1,2,3-Trichloropropane	96-18-4	10	60	---	---	---	---	---
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	1000	7600	1250	9500	---	---	---
Triethylamine	121-44-8	10	40	15	60	---	---	---
Trifluorobromomethane	75-63-8	1000	6100	---	---	---	---	---
Trimellitic anhydride	552-30-7	0.005	0.04	---	---	---	---	---
Trimethylamine	75-50-3	10	24	15	36	---	---	---
Trimethyl benzene	25551-13-7	25	125	---	---	---	---	---
Trimethyl phosphite	121-45-9	2	10	---	---	---	---	---
2,4,6-Trinitrophenyl; see Picric acid								
2,4,6-Trinitrophenylmethyl-nitramine; see Tetryl								
2,4,6-Trinitrotoluene (TNT)	118-96-7	---	0.5	---	---	---	---	X
Triorthocresyl phosphate	78-30-8	---	0.1	---	---	---	---	X
Triphenyl amine	603-34-9	---	5	---	---	---	---	---
Triphenyl phosphate	115-86-6	---	3	---	---	---	---	---
Tungsten (as W)	7440-33-7	---	5	---	10	---	---	---
Insoluble compounds		---	1	---	3	---	---	---
Soluble compounds		---	560	---	---	---	---	---
Turpentine	8006-64-2	100				---	---	---
Uranium (as U)	7440-61-1	---	0.05	---	---	---	---	---
Soluble compounds		---	0.2	---	0.6	---	---	---
Insoluble compounds		---	175	---	---	---	---	---
n-Valeraldehyde	110-62-3	50				---	---	---

Substance	CAS No.	TWA		STEL		CEILING		Skin Designation
		ppm	mg/m ³	ppm	mg/m ³	ppm	mg/m ³	
Vanadium fume and respirable dust (as V ₂ O ₅)	1314-62-1	---	0.05	---	---	---	---	---
Vegetable oil mist	---	---	---	---	---	---	---	---
Total dust		---	15	---	---	---	---	---
Respirable fraction		---	5	---	---	---	---	---
Vinyl acetate	108-05-4	10	30	20	60	---	---	---
Vinyl benzene; see Styrene								
Vinyl bromide	593-60-2	5	20	---	---	---	---	---
Vinyl chloride; see 1910.1017	75-01-4							
Vinyl cyanide; see Acrylonitrile								
Vinyl cyclohexene dioxide	106-87-6	10	60	---	---	---	---	X
Vinylidene chloride (1,1-Dichloroethylene)	75-35-4	1	4	---	---	---	---	---
Vinyl toluene	25013-15-4	100	480	---	---	---	---	---
VM & P Naphtha	8032-32-4	300	1350	400	1800	---	---	---
Warfarin	81-81-2	---	0.1	---	---	---	---	---
Welding fumes (total particulate)	---	---	5	---	---	---	---	---
Wood dust, all soft and hard woods, except Western red cedar	---	---	5	---	10	---	---	---
Wood dust, Western red cedar	---	---	2.5	---	---	---	---	---
Xylenes (o-,m-,p- isomers)	1330-20-7	100	435	150	655	---	---	---
m-Xylene alpha, alpha-diamine	1477-55-0	---	---	---	---	---	0.1	X
Xylidine	1300-73-8	2	10	---	---	---	---	X
Yttrium	7440-65-5	---	1	---	---	---	---	---
Zinc chloride fume	7646-85-7	---	1	---	2	---	---	---
Zinc chromate (as CrO ₃)	Varies	---	---	---	---	---	0.1	---
Zinc oxide	1314-13-2	---	---	---	---	---	---	---
Fume		---	5	---	10	---	---	---
Total dust		---	10	---	---	---	---	---
Respirable fraction		---	5	---	---	---	---	---
Zinc stearate	557-05-1	---	---	---	---	---	---	---
Total dust		---	10	---	---	---	---	---
Respirable fraction		---	5	---	---	---	---	---
Zirconium compounds (as Zr)	7440-67-7	---	5	---	10	---	---	---