

DEPARTMENT OF PUBLIC HEALTH
OCCUPATIONAL HEALTH STANDARDS COMMISSION
AIR CONTAMINANTS

Filed with the Secretary of State on December 7, 1990
These rules take effect 15 days after filing with the Secretary of State

(By authority conferred on the occupational health standards commission by section 24 of Act No. 154 of the Public Acts of 1974, as amended, being §408.1024 of the Michigan Compiled Laws)

R 325.51101 Applicability; replacement of O.H. rules.

Rule 1. (1) These rules do not apply to the following types of employment:

- (a) Agriculture.
- (b) Construction.
- (c) Domestic.
- (d) Mining.

(2) These rules replace O.H. rules 2101, 2102, 2103, and 2104.

R 325.51102 Definitions.

Rule 2. As used in these rules:

(a) "Ceiling" means the employee's exposure which shall not be exceeded during any part of the workday. If instantaneous monitoring is not feasible, 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.

(b) "Permissible exposure limit (PEL)" means the maximum concentration to which an employee may be exposed averaged over an 8-hour period.

(c) "Short-term exposure limit (STEL)" means the employee's 15-minute, time-weighted average exposure which shall not be exceeded at any time during a workday unless another time limit is specified in a parenthetical notation below the limit. Such exposures shall not occur more than 4 times during a workday and there shall be not less than 60 minutes between successive exposures at the STEL. If another time period is specified, the time-weighted average exposure over that time limit shall not be exceeded at any time during the workday.

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

(e) The terms "substance," "air contaminant," and "material" are equivalent in meaning for purposes of these rules.

R 325.51103 Exposure limits.

Rule 3. An employee's exposure to any substance listed in tables G-1-A, G-2, or G-3 of these rules shall be limited in accordance with the requirements of the following provisions:

(a) With respect to table G-1-A, all of the following provisions apply:

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(i) An employee's exposure to any substance in table G-1-A under the transitional limits columns, the exposure limit of which is preceded by a C, shall at no time exceed the exposure limit given for that substance in table G-1-A under the transitional limits columns.

(ii) An employee's exposure to any substance in table G-1-A under the transitional limits columns, the exposure limit of which is not preceded by a C, shall not exceed the 8-hour, time-weighted average given for that substance

in table G-1-A under the transitional limits columns in any 8-hour work shift of a 40-hour work week.

(iii) An employee's exposure to any substance listed in table G-1-A shall not exceed the time-weighted average (TWA), short-term exposure limit (STEL) and ceiling limit specified for that substance in table G-1-A under the final rule limits columns.

(iv) To prevent or reduce skin absorption, an employee's skin exposure to substances listed in table G-1-A with an X in one or both of the skin designation columns following the substance name shall be prevented or reduced to the extent necessary under the circumstances through the use of gloves, coveralls, goggles, or other appropriate personal protective equipment, engineering controls, or work practices.

(b) With respect to table G-2, all of the following provisions apply:

(i) Table G-2 is applicable for the transitional period and to the extent set forth in R 325.51106.

(ii) An employee's exposure to any material listed in table G-2 in any 8-hour work shift of a 40-hour work week shall not exceed the 8-hour, time-weighted average limit given for that material in table G-2.

(iii) An employee's exposure to a material listed in table G-2 shall not exceed, at any time during an 8-hour shift, the acceptable ceiling concentration limit given for the material in the table, except for a period of time and up to a concentration that does not exceed the maximum duration and concentration allowed in the column under "acceptable maximum peak above the ceiling concentration for an 8-hour shift." For example, during an 8-hour work shift, an employee may be exposed to a concentration of substance A (with a 10 parts of contaminant per million parts of air (ppm) TWA, 25 ppm ceiling and 50 ppm peak) above 25 ppm (but not above 50 ppm) only for a maximum period of 10 minutes. Such exposure shall be compensated for by exposures to concentrations less than 10 ppm so that the cumulative exposure for the entire 8-hour work shift does not exceed a weighted average of 10 ppm.

(iv) If a substance is preceded by S, an employer shall take the necessary precautions to prevent a person from absorbing a contaminant through his or her skin.

(c) Table G-3 is applicable for the transitional period and to the extent set forth in R 325.51106. An employee's exposure to any substance listed in table G-3 in any 8-hour work shift of a 40-hour work week shall not exceed the 8-hour, time-weighted average limit given for that substance in the table.

R 325.51104 Computation formulae.

Rule 4. The computation formula which shall apply to employee exposure to more than 1 substance for which 8-hour, time-weighted averages are listed in table G-1-A, G-2, or G-3 in order to determine whether an employee is exposed over the regulatory limit is as follows:

(a) 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 table G-1-A, G-2, or G-3 for the material involved.

To illustrate the formula prescribed in this subdivision, assume that substance A has an 8-hour, time-weighted average limit of 100 ppm noted in table G-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:

$$(2 \times 150 + 2 \times 75 + 4 \times 50) \div 8 = 81.25 \text{ ppm}$$

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

(b) For 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.

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

To illustrate the formula prescribed in this subdivision, consider the following exposures:

Material	Actual concentration of 8-hour exposure (ppm)	8-hour TWA PEL (ppm)
Substance B	500	1,000
Substance C	45	200
Substance D	40	200

Substituting in the formula:

$$E_m = 500 \div 1,000 + 45 \div 200 + 40 \div 200$$

$$E_m = 0.500 + 0.225 + 0.200$$

$$E_m = 0.925$$

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

R 325.51105 Methods of compliance.

Rule 5. To achieve compliance with the provisions of R 325.51103 and R 325.51104, administrative or engineering controls shall first be determined and implemented when 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 these rules. Any equipment and technical measures used for this purpose shall be approved for each particular use by a competent industrial hygienist or other technically qualified person. When respirators are used, their use shall comply with the provisions of O.H. rule 3502:

respiratory protection.

R 325.51106 Start-up dates; transitional provisions.

Rule 6. (1) Start-up dates are as follows:

(a) The permissible exposure limits specified in the final rule limits columns of table G-1-A shall be achieved by any reasonable combination of engineering controls, work practices, and personal protective equipment through December 30, 1993.

(b) The permissible exposure limits specified in the final rule limits columns of table G-1-A shall be achieved by the methods of compliance specified in R 325.51105 effective December 31, 1993.

(2) Transitional provisions are as follows:

(a) The permissible exposure limits specified in the transitional limits column of tables G-1-A, G-2, and G-3 shall continue to be achieved by the methods of compliance specified in R 325.51105 through December 30, 1993.

(b) The permissible exposure limits specified in tables G-2 and G-3 for substances mentioned in the final rule limits column of table G-1-A only by cross reference to table G-2 or G-3 shall remain in effect indefinitely and continue to be achieved by the methods of compliance specified in R 325.51105.

(c) If any new or amended provisions or new or revised limits for any substance or substances are either administratively stayed or judicially stayed or vacated, then the existing provisions or limits for those substances specified in the transitional limits columns of table G-1-A, table G-2 or table G-3 shall remain in effect until such stay is lifted or, if the limit is vacated, shall remain in effect indefinitely.

R 325.51107 Stay of enforcement.

Rule 7. Enforcement of the limits are indefinitely stayed for the following substances until the United States department of labor, occupational safety and health administration (OSHA) publishes in the Federal Register a notice that a sampling and analytical technique is available:

- (a) Aluminum alkyls.
- (b) Ethylidene norbornene.
- (c) Hexafluoroacetone.
- (d) Mercury (alkyl compounds).
- (e) Oxygen difluoride.
- (f) Phenylphosphine.
- (g) Sulfur pentafluoride.

R 325.51108 Tables.

Rule 8. Tables G-1-A, G-2, and G-3 read as follows:

TABLE G-1-A. LIMITS FOR AIR CONTAMINANTS

TRANSITIONAL LIMITS					FINAL RULE LIMITS**						
		PEL*			TWA		STEL ^c		Ceiling		
Substance	CAS No. ^e	ppm ^a	mg/m ^{3b}	Skin De- signation	ppm ^a	mg/m ^{3b}	ppm ^a	mg/m ^{3b}	ppm ^a	mg/m ^{3b}	Skin De- signation
Abate		–	15	–	–	15	–	–	–	–	–
Acetyldehyde	75-07-0	200	360	–	100	180	150	270	–	–	–
Acetic acid	64-19-7	10	25	–	10	25	–	–	–	–	–
Acetic anhydride	108-24-7	5	20	–	–	–	–	–	5	20	–
Acetone	67-64-1	1000	2400	–	750	1800	1000	2400	–	–	–
Acetonitrile	75-05-8	40	70	–	40	70	60	105	–	–	–
2-Acetylaminofluorine; see O.H. rule 2301(1)	53-96-3										
Acetylene dichloride; see 1,2-Dichloroethylene											
Acetylene tetrabromide	79-27-6	1	14	–	1	14	–	–	–	–	–
Acetylsalicylic acid (Aspirin)	50-78-2	–	–	–	–	5	–	–	–	–	–
Acrolein	107-02-8	0.1	0.25	–	0.1	0.25	0.3	0.8	–	–	–
Acrylamide	79-06-1	–	0.3	x	–	0.03	–	–	–	–	x
Acrylic acid	79-10-7	–	–	–	10	30	–	–	–	–	x
Acrylonitrile; see R 325.51501 et seq.	107-31-1										
Aldrin	309-00-2	–	0.25	x	–	0.25	–	–	–	–	x
Allyl alcohol	107-18-6	2	5	x	2	5	4	10	–	–	x
Allyl chloride	107-05-1	1	3	–	1	3	2	6	–	–	–
Allyl glycidyl ether (AGE)	106-92-3	(C)10	(C)45	–	5	22	10	44	–	–	–
Allyl propyl disulfide	2179-59-1	2	12	–	2	12	3	18	–	–	–

TRANSITIONAL LIMITS					FINAL RULE LIMITS**						
		PEL*			TWA		STEL ^c		Ceiling		
Substance	CAS No. ^e	ppm ^a	mg/m ^{3b}	Skin De- signation	ppm ^a	mg/m ^{3b}	ppm ^a	mg/m ^{3b}	ppm ^a	mg/m ^{3b}	Skin De- signation
alpha-Alumina	1344-28-1	-	15	-	-	10	-	-	-	-	-
Total dust		-	5	-	-	5	-	-	-	-	-
Respirable fraction		-	5	-	-	5	-	-	-	-	-
Aluminum (as AL)	7429-90-5										
Metal											
Total dust		-	15	-	-	15	-	-	-	-	-
Respirable fraction		-	5	-	-	5	-	-	-	-	-
Pyro powders		-	-	-	-	5	-	-	-	-	-
Welding Fumes***		-	-	-	-	5	-	-	-	-	-
Soluble salts		-	-	-	-	2	-	-	-	-	-
Alkyls		-	-	-	-	2	-	-	-	-	-
4-Aminodiphenyl; see O.H. rule 2301(2)	92-67-1										
2-Aminoethanol; see Ethanalamine											
2-Aminopyridine	504-29-0	0.5	2	-	0.5	2	-	-	-	-	-
Amitrole	61-82-5	-	-	-	-	0.2	-	-	-	-	-
Ammonia	7664-41-7	50	35	-	-	-	35	27	-	-	-
Ammonium chloride fume	12125-02-9	-	-	-	-	10	-	20	-	-	-
Ammonium sulfamate	7773-06-0										
Total dust		-	15	-	-	10	-	-	-	-	-
Respirable fraction		-	5	-	-	5	-	-	-	-	-
n-Amyl acetate	628-63-7	100	525	-	100	525	-	-	-	-	-
sec-Amyl acetate	626-38-0	125	650	-	125	650	-	-	-	-	-
Aniline and homologs	62-53-3	5	19	x	2	8	-	-	-	-	x
Anisidine (o-, p-isomers)	29191-52-4	-	0.5	x	-	0.5	-	-	-	-	x
Antimony and compounds (as Sb)	7440-36-0	-	0.5	-	-	0.5	-	-	-	-	-
ANTU (alpha naphthyl- thiourea)	86-88-4	-	0.3	-	-	0.3	-	-	-	-	-

TRANSITIONAL LIMITS					FINAL RULE LIMITS**						
		PEL*			TWA		STEL ^c		Ceiling		
Substance	CAS No. ^e	ppm ^a	mg/m ^{3b}	Skin De- signation	ppm ^a	mg/m ^{3b}	ppm ^a	mg/m ^{3b}	ppm ^a	mg/m ^{3b}	Skin De- signation
Arsenic, organic compounds (as As)	7440-38-2	-	0.5	-	-	0.5	-	-	-	-	-
Arsenic, inorganic compounds (as As) see R 325.51601 et seq.	7440-38-2										
Arsine	7784-42-1	0.05	0.2	-	0.05	0.2	-	-	-	-	-
Asbestos; see O.H. rule 2205	Varies										
Atrazine	1912-24-9	-	-	-	-	5	-	-	-	-	-
Azinphos-methyl	86-50-0	-	0.2	x	-	0.2	-	-	-	-	x
Baruim, soluble compounds (as Ba)	7440-39-3	-	0.5	-	-	0.5	-	-	-	-	-
Barium sulfate Total dust Respirable fraction	7727-43-7	- -	15 5	- -	- -	10 5	- -	- -	- -	- -	- -
Benomyl Total dust Respirable fraction	17804-35-2	- -	15 5	- -	- -	10 5	- -	- -	- -	- -	- -
Benzene; see R 325.77101 et seq.	71-43-2	See table G-2 for the limits applicable in the operations or sectors excluded in R 325.77101 ^d									
Benzidine; see O.H. rule 2301 (3)	92-87-5										
p-Benzoquinone; see Quinone											
Benzo(a)pyrene; see Coal tar pitch volatiles											
Benzoyl peroxide	94-36-0	-	5	-	-	5	-	-	-	-	-
Benzyl chloride	100-44-7	1	5	-	1	5	-	-	-	-	-
Beryllium and beryllium compounds (as Be)	7440-41-7	See table G-2			See table G-2						
Biphenyl; see Diphenyl											

TRANSITIONAL LIMITS					FINAL RULE LIMITS**						
		PEL*			TWA		STEL ^c		Ceiling		
Substance	CAS No. ^b	ppm ^a	mg/m ^{3B}	Skin De- signation	ppm ^a	mg/m ^{3B}	ppm ^a	mg/m ^{3B}	ppm ^a	mg/m ^{3B}	Skin De- signation
Bismuth telluride, Undoped	1304-82-1	-	15	-	-	15	-	-	-	-	-
Total dust		-	5	-	-	5	-	-	-	-	-
Respirable fraction		-			-		-		-		
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 - Total dust	1303-86-2	-	15	-	-	10	-	-	-	-	-
Boron tribromide	10294-33-4	-	-	-	-	-	-	-	1	10	-
Boron Trifluoride	7637-07-2	(C) 1	(C) 3	-	-	-	-	-	1	3	-
Bromacil	314-40-9	-	-	-	1	10	-	-	-	-	-
Bromine	7726-95-6	0.1	0.7	-	0.1	0.7	0.3	2	-	-	-
Bromine pentafluoride	7789-30-2	0.1	-	-	0.1	0.7	-	-	-	-	-
Bromoform	75-25-2	0.5	5	x	0.5	5	-	-	-	-	-
Butadiene (1,3-Butadiene)	106-99-0	1000	2200	-			1000	2200	-	-	-
Butane	106-97-8	-	-	-	800	1900	-	-	-	-	-
Butanethiol; see Butyl mercaptan											
2-Butanone (Methyl ethyl ketone)	78-93-3	200	590	-	200	590	300	885	-	-	-
2-Butoxyethanol	111-76-2	50	240	x	25	120	-	-	-	-	x
n-Butyl-acetate	123-86-4	150	710	-	150	710	200	950	-	-	-
sec-Butyl acetate	105-46-4	200	950	-	200	950	-	-	-	-	-
tert-Butyl acetate	540-88-5	200	950	-	200	950	-	-	-	-	-
Butyl acrylate	141-32-2	-	-	-	10	55	-	-	-	-	-

TRANSITIONAL LIMITS					FINAL RULE LIMITS**						
		PEL*			TWA		STEL ^c		Ceiling		
Substance	CAS No. ^e	ppm ^a	mg/m ^{3b}	Skin De- signation	ppm ^a	mg/m ^{3b}	ppm ^a	mg/m ^{3b}	ppm ^a	mg/m ^{3b}	Skin De- signation
n-Butyl alcohol	71-36-3	100	300	-	-	-	-	-	50	150	x
sec-Butyl alcohol	78-92-2	150	450	-	100	305	-	-	-	-	--
tert-Butyl alcohol	75-65-0	100	300	-	100	300	150	450	-	-	-
Butylamine	109-73-9	(C) 5	(C) 5	x	-	-	-	-	5	15	x
tert-Butyl chromate (as CrO ₃)	1189-85-1	-	(C) 0.1	x	-	-	-	-	-	0.1	x
n-Butyl glycidyl ether (BGE)	2426-08-6	50	270	-	25	135	-	-	-	-	-
n-Butyl lactate	138-22-7	-	-	-	5	25	-	-	-	-	-
Butyl mercaptan	109-79-5	0.5	1.5	-	0.5	1.5	-	-	-	-	-
o-sec-Butylphenol	89-72-5	-	-	-	5	30	-	-	-	-	x
p-tert-Butyltoluene	98-51-1	10	60	-	10	60	20	120	-	-	-
Cadmium fume (as Cd)	7440-43-9	See table G-2			-	0.1	-	-	-	0.3	-
Cadmium dust (as Cd)	7440-43-9	See table G-2			-	0.2	-	-	-	0.6	-
Calcium carbonate Total dust Respirable fraction	1317-65-3	- -	15 5	- -	- -	15 5	- -	- -	- -	- -	- -
Calcium cyanamide	156-62-7	-	-	-	-	0.5	-	-	-	-	-
Calcium hydroxide	1305-62-0	-	-	-	-	5	-	-	-	-	-
Calcium oxide	1305-78-8	-	5	-	-	5	-	-	-	-	-
Calcium silicate Total dust Respirable fraction	1344-95-2	- -	15 5	- -	- -	15 5	- -	- -	- -	- -	- -
Calcium sulfate Total dust Respirable fraction	7778-18-9	- -	15 5	- -	- -	15 5	- -	- -	- -	- -	- -
Camphor, synthetic	76-22-2	-	2	-	-	2	-	-	-	-	-

TRANSITIONAL LIMITS					FINAL RULE LIMITS**						
		PEL*			TWA		STEL ^c		Ceiling		
Substance	CAS No. ^B	ppm ^A	mg/m ^{3B}	Skin De- signation	ppm ^A	mg/m ^{3B}	ppm ^A	mg/m ^{3B}	ppm ^A	mg/m ^{3B}	Skin De- signation
Caprolactam Dust Vapor	105-60-2	-	-	-	-	1	-	3	-	-	-
		-	-	-	5	20	10	40	-	-	-
Captafol (Difolatan ^R)	2425-06-1	-	-	-	-	0.1	-	-	-	-	-
Captan	133-06-2	-	-	-	-	5	-	-	-	-	-
Carbaryl (Sevin ^R)	63-25-2	-	5	-	-	5	-	-	-	-	-
Carbofuran (Furadan ^R)	1563-66-2	-	-	-	-	0.1	-	-	-	-	-
Carbon black	1333-86-4	-	3.5	-	-	3.5	-	-	-	-	-
Carbon dioxide	124-38-9	5000	9000	-	10,000	18,000	30,000	54,000	-	-	-
Carbon disulfate	75-15-0	See table G-2			4	12	12	36	-	-	x
Carbon monoxide	630-08-0	50	55	-	35	40	-	-	200	229	-
Carbon tetrabromide	558-13-4	-	-	-	0.1	1.4	0.3	4	-	-	-
Carbon tetrachloride	56-23-5	See table G-2			2	12.6	-	-	-	-	-
Carbonyl fluoride	353-50-4	-	-	-	2	5	5	15	-	-	-
Catechol (Pyrocatechol)	120-80-9	-	-	-	5	20	-	-	-	-	x
Cellulose Total dust Respirable fraction	9004-34-6	-	15	-	-	15	-	-	-	-	-
		-	5	-	-	5	-	-	-	-	-
Cesium hydroxide	21351-79-1	-	-	-	-	2	-	-	-	-	-
Chlordane	57-74-9	-	0.5	x	-	0.5	-	-	-	-	x
Chlorinated camphene	8001-35-2	-	0.5	x	-	0.5	-	1	-	-	x
Chlorinated diphenyl oxide	55720-99-5	-	0.5	-	-	0.5	-	-	-	-	-
Chlorine	7782-50-5	(C) 1	(C) 3	-	0.5	1.5	1	3	-	-	-
Chlorine dioxide	10049-04-4	0.1	0.3	-	0.1	0.3	0.3	0.9	-	-	-
Chlorine trifluoride	7790-91-2	(C) 0.1	(C) 0.4	-	-	-	-	-	0.1	0.4	-
TRANSITIONAL LIMITS					FINAL RULE LIMITS**						
		PEL*			TWA		STEL ^c		Ceiling		

Substance	CAS No. ^B	ppm ^A	mg/m ^{3B}	Skin De- signation	ppm ^A	mg/m ^{3B}	ppm ^A	mg/m ^{3B}	ppm ^A	mg/m ^{3B}	Skin De- signation
Chloroacetaldehyde	107-20-0	(C) 1	(C) 3	-	-	-	-	-	1	3	-
a-Chloroacetophenone (Phenacyl chloride)	532-27-4	0.05	0.3	-	0.5	0.3	-	-	-	-	-
Chloroacetyl chloride	79-04-9	-	-	-	0.5	0.2	-	-	-	-	-
Chlorobenzene	108-90-7	75	350	-	75	350	-	-	-	-	-
o-Chlorobenzylidene malonitrile	2698-41-1	0.05	0.4	-	-	-	-	-	0.05	0.4	x
Chlorobromomethane	74-97-5	200	1050	-	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	-	1	-	-	-	-	x
Chlorodiphenyl (54% Chlorine) (PCB)	11097-69-1	-	0.5	x	-	0.5	-	-	-	-	x
1-Chloro,2,3-epoxypropane; see Epichlorohydrin											
2-Chloroethanol; see Ethylene chlorohydrin											
Chloroethylene; see Vinyl chloride											
Chloroform (Trichloromethane)	67-66-3	(C) 50	(C) 240	-	2	9.78	-	-	-	-	-
bis(Chloromethyl) ether; see O.H. Rule 2301(4)	542-88-1										
Chloromethyl methyl ether; see O.H. rule 2301(8)	107-30-2										
1-Chloro-1-nitropropane	600-25-9	20	100	-	4	10	-	-	-	-	-
Chloropentafluoroethane	76-15-3	-	-	-	1000	6320	-	-	-	-	-
Chloropicrin	76-06-2	0.1	0.7	-	0.1	0.7	-	-	-	-	-
TRANSITIONAL LIMITS					FINAL RULE LIMITS**						
		PEL*			TWA		STEL ^C		Ceiling		

Substance	CAS No. ^B	ppm ^A	mg/m ^{3B}	Skin De- signation	ppm ^A	mg/m ^{3B}	ppm ^A	mg/m ^{3B}	ppm ^A	mg/m ^{3B}	Skin De- signation
beta-Chloroprene	126-99-8	25	90	x	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 Total dust Respirable fraction	1929-82-4	- -	15 5	- -	- -	15 5	- -	- -	- -	- -	- -
Chlorpyrifos	2921-88-2	-	-	-	-	0.2	-	-	-	-	x
Chromic acid and chromates (As CrO ₃)	Varies with compound	See table G-2			-	-	-	-	-	0.1	-
Chromium (II) compounds (as Cr)	7440-47-3	-	0.5	-	-	0.5	-	-	-	-	-
Chromium (III) compounds (as Cr)	7440-47-3	-	0.5	-	-	0.5	-	-	-	-	-
Chromium metal (as Cr)	7440-47-3	-	1	-	-	1	-	-	-	-	-
Chrysene; see Coal tar pitch volatiles											
Clopidol Total dust Respirable fraction	2971-90-6	- -	15 5	- -	- -	15 5	- -	- -	- -	- -	- -
Coal dust (less than 5% SiO ₂) Respirable quartz faction	-	See table G-3			-	2	-	-	-	-	-
Coal dust (greater than or equal to 5% SiO ₂), Respirable fraction	-	See table G-3			-	0.1	-	-	-	-	-
Coal tar pitch volatiles (benzene soluble fraction), anthracene, BaP, phenanthrene, acridine, chrysene, pyrene	65996-93-2	-	0.2	-	-	0.2	-	-	-	-	-
Cobalt metal, dust, and fume (as Co)	7740-48-4	-	0.1	-	-	0.05	-	-	-	-	-

TRANSITIONAL LIMITS					FINAL RULE LIMITS**						
		PEL*			TWA		STEL ^c		Ceiling		
Substance	CAS No. ^B	ppm ^A	mg/m ^{3B}	Skin De- signation	ppm ^A	mg/m ^{3B}	ppm ^A	mg/m ^{3B}	ppm ^A	mg/m ^{3B}	Skin De- signation
Cobalt carbonyl (as Co)	10210-68-1	-	-	-	-	0.1	-	-	-	-	-
Colbalt hydrocarbonyl (as Co)	16842-03-8	-	-	-	-	0.1	-	-	-	-	-
Coke oven emissions; see R 325.50101 et seq.	-										
Copper Fume (as Cu) Dusts and mists (as Cu)	7440-50-8	- -	0.1 1	- -	- -	0.1 1	- -	- -	- -	- -	- -
Cotton dust (raw)	-		1			1	-	-	-	-	-
Crag herbicide (Sesone) Total dust Respirable fraction	136-78-7	- -	15 5	- -	- -	10 5	- -	- -	- -	- -	- -
Cresol, all isomers	1319-77-3	5	22	x	5	22	-	-	-	-	x
Crotonaldehyde	123-73-9 4170-30-3	2	6	-	2	6	-	-	-	-	-
Crufomate	299-86-5	-	-	-	-	5	-	-	-	-	-
Cumene	98-82-8	50	245	x	50	245	-	-	-	-	x
Cyanamide	420-04-2	-	-	-	-	2	-	-	-	-	-
Cyanides (as CN)	Varies with compound	-	5	-	-	5	-	-	-	-	-
Cyanogen	460-19-5	10	-	-	10	20	-	-	-	-	-
Cyanogen chloride	506-77-4	-	-	-	-	-	-	-	0.3	0.6	-
Cyclohexane	110-82-7	300	1050	-	300	1050	-	-	-	-	-
Cyclohexanol	108-93-0	50	200	-	50	200	-	-	-	-	x
Cyclohexanone	108-94-1	50	200	-	25	100	-	-	-	-	x
Cyclohexene	110-83-8	300	1015	-	300	1015	-	-	-	-	-
Cyclohexylamine	108-91-8	-	-	-	10	40	-	-	-	-	-
Cyclonite	121-82-4	-	-	-	-	1.5	-	-	-	-	x
TRANSITIONAL LIMITS					FINAL RULE LIMITS**						
		PEL*			TWA		STEL ^c		Ceiling		

Substance	CAS No. ^B	ppm ^A	mg/m ^{3B}	Skin De- signation	ppm ^A	mg/m ^{3B}	ppm ^A	mg/m ^{3B}	ppm ^A	mg/m ^{3B}	Skin De- signation
Cyclopentadiene	542-92-7	75	200	-	75	200	-	-	-	-	-
Cyclopentane	287-92-3	-	-	-	600	1720	-	-	-	-	-
Cyhexatin	13121-70-5	-	-	-	-	5	-	-	-	-	-
2,4-D (Dichlorylphenoxy- acetic acid)	94-75-7	-	10	-	-	10	-	-	-	-	-
Decaborane	17702-41-9	0.05	0.3	x	0.05	0.3	0.15	0.9	-	-	x
Demeton (Systox [®])	8065-48-3	-	0.1	x	-	0.1	-	-	-	-	x
Dibutyl Phosphate	107-66-4	1	5	-	1	5	-	-	-	-	-
Dichloroacetylene	7572-29-4	0.1	0.4	-	-	-	-	-	0.1	0.4	-
Dichlorodiphenyltri- chloroethane (DDT)	50-29-3	-	1	x	-	1	-	-	-	-	x
Dichlorvos (DDVP)	62-73-7	-	1	x	-	1	-	-	-	-	x
Diacetone alcohol (4-Hydroxy-4-methyl- 2-pentanone)	123-42-2	50	240	-	50	240	-	-	-	-	-
1,2-Diaminoethane; see Ethylenediamine											
Diazinon	333-41-5	-	-	-	-	0.1	-	-	-	-	x
Diazomethane	334-88-3	0.2	0.4	-	0.2	0.4	-	-	-	-	-
Diborane	19287-45-7	0.1	0.1	-	0.1	0.1	-	-	-	-	-
2-N-Dibutylaminoethanol	102-81-8	-	-	-	2	14	-	-	-	-	-
Dibutyl phosphate	107-66-4	1	5	-	1	5	2	10	-	-	-
Dibutyl phthalate	84-74-2	-	5	-	-	5	-	-	-	-	-
Dichloroacetylene	7572-29-4	-	-	-	-	-	-	-	0.1	0.4	-
o-Dichlorobenzene	95-50-1	(C) 50	(C) 300	-	-	-	-	-	50	300	-
p-Dichlorobenzene	106-46-7	75	450	-	75	450	110	675	-	-	-
TRANSITIONAL LIMITS					FINAL RULE LIMITS**						
		PEL*			TWA		STEL ^C		Ceiling		
Substance	CAS No. ^B	ppm ^A	mg/m ^{3B}	Skin De- signation	ppm ^A	mg/m ^{3B}	ppm ^A	mg/m ^{3B}	ppm ^A	mg/m ^{3B}	Skin De- signation

3,3'-Dichlorobenzidine; see O.H. rule 2301(5)	91-94-1										
Dichlorodifluoromethane	75-71-8	1000	4950	-	1000	4950	-	-	-	-	-
1,3-Dichloro-5,5-dimethyl hydantoin	118-52-5	-	0.2	-	-	0.2	-	0.4	-	-	-
1,1-Dichloroethane	75-34-3	100	400	-	100	400	-	-	-	-	-
1,2-Dichloroethylene	540-59-0	200	790	-	200	790	-	-	-	-	-
Dichloroethyl ether	111-44-4	(C)15	(C)90	x	5	30	10	60	-	-	x
Dichloromethane; see Methylene chloride											
Dichloromonofluoromethane	75-43-4	1000	4200	-	10	40	-	-	-	-	-
1,1-Dichloro-1-nitroethane	594-72-9	(C)10	(C)60	-	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	-	1000	7000	-	-	-	-	-
Dicrotophos	141-66-2	-	-	-	-	0.25	-	-	-	-	x
Dicyclopentadiene	77-73-6	-	-	-	5	30	-	-	-	-	-
Dicyclopentadienyl iron Total dust Respirable fraction	102-54-5	- -	15 5	- -	- -	10 5	- -	- -	- -	- -	- -
Dieldrin	60-57-1	-	0.25	x	-	0.25	-	-	-	-	x
Diethanolamine	111-42-2	-	-	-	3	15	-	-	-	-	-
Diethylamine	109-89-7	25	75	-	10	30	25	75	-	-	-
2-Diethylaminoethanol	100-37-8	10	50	x	10	50	-	-	-	-	x

TRANSITIONAL LIMITS					FINAL RULE LIMITS**							
		PEL*			TWA		STEL ^c		Ceiling			
Substance	CAS No. ^E	ppm ^A	mg/m ^{3B}	Skin De- signation	ppm ^A	mg/m ^{3B}	ppm ^A	mg/m ^{3B}	ppm ^A	mg/m ^{3B}	Skin De- signation	
Diethylene triamine	111-40-0	10	42	x	1	4	–	–	–	–	x	
Diethyl ether; see Ethyl ether												
Diethyl ketone	96-22-0	–	–	–	200	705	–	–	–	–	–	
Diethyl phthalate	84-66-2	–	–	–	–	5	–	–	–	–	–	
Difluorodibromomethane	75-61-6	100	860	–	100	860	–	–	–	–	–	
Diglycidyl ether (DGE)	2238-07-5	(C) 0.5	(C) 2.8	–	0.1	0.5	–	–	–	–	–	
Dihydroxybenzene; see Hydroquinone												
Diisobutyl ketone	108-83-8	50	290	–	25	150	–	–	–	–	–	
Diisopropylamine	108-18-9	5	20	x	5	20	–	–	–	–	x	
4-Dimethylaminoazobenzene; see O.H. rule 2301(6)	60-11-7											
Dimethoxymethane; see Methylal												
Dimethyl acetamide	127-19-5	10	35	x	10	35	–	–	–	–	x	
Dimethylamine	124-40-3	10	18	–	10	18	–	–	–	–	–	
Dimethylaminobenzene; see Xylidine												
Dimethylaniline (N-Dimethyl-aniline)	121-69-7	5	25	x	5	25	10	50	–	–	x	
Dimethylbenzene; see Xylene												
Dimethyl-1,2-dibromo-2,2- dichloroethyl phosphate	300-76-5	–	3	–	–	3	–	–	–	–	x	
Dimethylformamide	68-12-2	10	30	x	10	30	–	–	–	–	x	
2,6-Dimethyl-4-heptanone; see Diisobutyl ketone												
TRANSITIONAL LIMITS					FINAL RULE LIMITS**							
		PEL*			TWA		STEL ^c		Ceiling			

Substance	CAS No. ^B	ppm ^A	mg/m ^{3B}	Skin De- signation	ppm ^A	mg/m ^{3B}	ppm ^A	mg/m ^{3B}	ppm ^A	mg/m ^{3B}	Skin De- signation
1,1-Dimethylhydrazine	57-14-7	0.5	1	x	0.5	1	-	-	-	-	x
Dimethylphthalate	131-11-3	-	5	-	-	5	-	-	-	-	-
Dimethyl sulfate	77-78-1	1	5	x	0.1	0.5	-	-	-	-	x
Dinitolmide (3,5-Dinitro-o-toluidamide)	148-01-6	-	-	-	-	5	-	-	-	-	-
Dinitrobenzene (all isomers) (alpha-) (meta-) (para-)	528-29-0 99-65-0 100-25-4	-	1	x	-	1	-	-	-	-	x
Dinitro-o-cresol	534-52-1	-	0.2	x	-	0.2	-	-	-	-	x
Dinitrotoluene	25321-14-6	-	1.5	x	-	1.5	-	-	-	-	x
Dioxane (diethylene dioxide)	123-91-1	100	360	x	25	90	-	-	-	-	x
Dioxathion (Delnav)	78-34-2	-	-	-	-	0.2	-	-	-	-	x
Diphenyl (Biphenyl)	92-52-4	0.2	1	-	0.2	1	-	-	-	-	-
Diphenylamine	122-39-4	-	10	-	-	10	-	-	-	-	-
Diphenylmethane diisocyanate; see Methylene bisphenyl isocyanate											
Dipropylene glycol methyl ether	34590-94-8	100	600	x	100	600	150	900	-	-	x
Dipropyl ketone	123-19-3	-	-	-	50	235	-	-	-	-	-
Diquat	85-00-7	-	-	-	-	0.5	-	-	-	-	-
Di-sec octyl phthalate (Di-2-ethylhexylphthalate)	117-81-7	-	5	-	-	5	-	10	-	-	-
Disulfiram	97-77-8	-	-	-	-	2	-	-	-	-	-
Disulfoton	298-04-4	-	-	-	-	0.1	-	-	-	-	x

TRANSITIONAL LIMITS					FINAL RULE LIMITS**						
		PEL*			TWA		STEL ^c		Ceiling		
Substance	CAS No. ^e	ppm ^a	mg/m ^{3b}	Skin De- signation	ppm ^a	mg/m ^{3b}	ppm ^a	mg/m ^{3b}	ppm ^a	mg/m ^{3b}	Skin De- signation
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 Respirable fraction	112-62-9	- -	15 5	- -	- -	10 5	- -	- -	- -	- -	- -
Endosulfan	115-29-7	-	0.1	x	-	0.1	-	-	-	-	x
Endrin	72-20-8	-	0.1	x	-	0.1	-	-	-	-	x
Epichlorohydrin	106-89-8	5	19	x	2	8	-	-	-	-	x
EPN	2104-64-5	-	0.5	x	-	0.5	-	-	-	-	x
1,2-Epoxypropane; see Propylene oxide											
2,3-Epoxy-1-propanol; see Glycidol											
Ethanethiol; see Ethyl mercaptan											
Ethanolamine	141-43-5	3	6	-	3	8	6	15	-	-	-
Ethion	563-12-2	-	-	-	-	0.4	-	-	-	-	x
2-Ethoxyethanol	110-80-5	200	740	x	200	740	-	-	-	-	x
2-Ethoxyethyl acetate (Cellosolve acetate)	111-15-9	100	540	x	100	540	-	-	-	-	x
Ethyl acetate	141-78-6	400	1400	-	400	1400	-	-	-	-	-
Ethyl acrylate	140-88-5	25	100	x	5	20	25	100	-	-	x
Ethyl alcohol (Ethanol)	64-17-5	1000	1900	-	1000	1900	-	-	-	-	-
Ethylamine	75-04-7	10	18	-	10	18	-	-	-	-	-
Ethyl amyl ketone (5-Methyl-3-heptanone)	541-85-5	25	130	-	25	130	-	-	-	-	-
Ethyl benzene	100-41-4	100	435	-	100	435	125	545	-	-	-
TRANSITIONAL LIMITS					FINAL RULE LIMITS**						

		PEL*			TWA		STEL ^c		Ceiling		
Substance	CAS No. ^B	ppm ^A	mg/m ^{3B}	Skin De- signation	ppm ^A	mg/m ^{3B}	ppm ^A	mg/m ^{3B}	ppm ^A	mg/m ^{3B}	Skin De- signation
Ethyl bromide	74-96-4	200	890	-	200	890	250	1100	-	-	-
Ethyl butyl ketone (3-Heptanone)	106-35-4	50	230	-	50	230	-	-	-	-	-
Ethyl chloride	75-00-3	1000	2600	-	1000	2600	-	-	-	-	-
Ethyl ether	60-29-7	400	1200	-	400	1200	-	500	1500	-	-
Ethyl formate	109-94-4	100	300	-	100	300	-	-	-	-	-
Ethyl mercaptan	75-08-1	(C)10	(C)25	-	0.5	1	-	-	-	-	-
Ethyl silicate	78-10-4	100	850	-	10	85	-	-	-	-	-
Ethylene chlorohydrin	107-07-3	5	16	x	-	-	-	-	1	3	x
Ethylenediamine	107-15-3	10	25	-	10	25	-	-	-	-	-
Ethylene dibromide	106-93-4	See table G-2			See table G-2						
Ethylene dichloride	107-06-2	See table G-2			1	4	2	8	-	-	-
Ethylene glycol	107-21-1	-	-	-	-	-	-	-	50	125	-
Ethylene glycol dinitrate	628-96-6	(C)0.2	(C)1	x	-	-	-	0.1	-	-	x
Ethylene glycol methyl acetate; see Methyl cellosolve acetate											
Ethyleneimine; see O.H. rule 2301(7)	151-56-4										
Ethylene oxide; see R 325.51151 et seq.	75-21-8										
Ethylidene chloride; see 1,1-Dichloroethane											
Ethylidene norbornene	16219-75-3	-	-	-	-	-	-	-	5	25	-
N-Ethylmorpholine	100-74-3	20	94	x	5	23	-	-	-	-	x
Fenamiphos	22224-92-6	-	-	-	-	0.1	-	-	-	-	x
Fensulfothion (Dasanit)	115-90-2	-	-	-	-	0.1	-	-	-	-	-
TRANSITIONAL LIMITS					FINAL RULE LIMITS**						
		PEL*			TWA		STEL ^c		Ceiling		

Substance	CAS No. ^B	ppm ^A	mg/m ^{3B}	Skin De- signation	ppm ^A	mg/m ^{3B}	ppm ^A	mg/m ^{3B}	ppm ^A	mg/m ^{3B}	Skin De- signation
Penthion	55-38-9	-	-	-	-	0.2	-	-	-	-	x
Ferbam Total dust	14484-64-1	-	15	-	-	10	-	-	-	-	-
Ferrovanadium dust	12604-58-9	-	1	-	-	1	-	3	-	-	-
Fluorides (as F)	Varies with compound	-	2.5	-	-	2.5	-	-	-	-	-
Fluorine	7782-41-4	0.1	0.2	-	0.1	0.2	-	-	-	-	-
Fluorotrichloromethane (Trichlorofluoromethane)	75-69-4	1000	5600	-	-	-	-	-	1000	5600	-
Ponofos	994-22-9	-	-	-	-	0.1	-	-	-	-	x
Formaldehyde	50-00-0	See table G-2			See table G-2						
Formamide	75-12-7	-	-	-	20	30	30	45	-	-	-
Formic acid	64-18-6	5	9	-	5	9	-	-	-	-	-
Furfural	98-01-1	5	20	x	2	8	-	-	-	-	x
Furfuryl alcohol	98-00-0	50	200	-	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) Total dust Respirable fraction	56-81-5	- - -	15 5	- - -	- - -	10 5	- - -	- - -	- - -	- - -	- - -
Glycidol	556-52-5	50	150	-	25	75	-	-	-	-	-
Glycol monoethyl ether; see 2-Ethoxyethanol											
Grain dust (oat, wheat, barley)	-	-	-	-	-	10	-	-	-	-	-
Graphite, natural respirable dust	7782-42-5	See table G-3			-	2.5	-	-	-	-	-
TRANSITIONAL LIMITS					FINAL RULE LIMITS**						
		PEL*			TWA		STEL ^C		Ceiling		
Substance	CAS No. ^B	ppm ^A	mg/m ^{3B}	Skin De- signation	ppm ^A	mg/m ^{3B}	ppm ^A	mg/m ^{3B}	ppm ^A	mg/m ^{3B}	Skin De- signation

Graphite, synthetic Total dust Respirable fraction	-	- -	15 5	- -	- -	10 5	- -	- -	- -	- -	- -
Guthion®; see Azinphos methyl											
Gypsum Total dust Respirable fraction	13397-24-5	- -	15 5	- -	- -	15 5	- -	- -	- -	- -	- -
Hafnium	7440-58-6	-	0.5	-	-	0.5	-	-	-	-	-
Heptachlor	76-44-8	-	0.5	x	-	0.5	-	-	-	-	x
Heptane (n-Heptane)	142-82-5	500	2000	-	400	1600	500	2000	-	-	-
Hexachlorobutadiene	87-68-3	-	-	-	-	0.02	0.24	-	-	-	-
Hexachlorocyclopentadiene	77-47-4	-	-	-	0.01	0.1	-	-	-	-	-
Hexachloroethane	67-72-1	1	10	x	1	10	-	-	-	-	x
Hexachloronaphthalene	1335-87-1	-	0.2	x	-	0.2	-	-	-	-	x
Hexafluoroacetone	684-16-2	-	-	-	0.1	0.7	-	-	-	-	x
n-Hexane	110-54-3	500	1800	-	50	180	-	-	-	-	-
Hexane isomers	Varies with compound	-	-	-	500	1800	1000	3600	-	-	-
2-Hexanone (Methyl n-butyl ketone)	591-78-6	100	410	-	5	20	-	-	-	-	-
Hexone (Methyl isobutyl ketone)	108-10-1	100	410	-	50	205	75	300	-	-	-
sec-Hexyl acetate	108-84-9	50	300	-	50	300	-	-	-	-	-
Hexylene glycol	107-41-5	-	-	-	-	-	-	-	25	125	-
Hydrazine	302-01-2	1	1.3	x	0.1	0.1	-	-	-	-	x
Hydrogenated terphenyls	61788-32-7	-	-	-	0.5	5	-	-	-	-	-
Hydrogen bromide	10035-10-6	3	10	-	-	-	-	-	3	10	-

TRANSITIONAL LIMITS					FINAL RULE LIMITS**						
		PEL*			TWA		STEL ^c		Ceiling		
Substance	CAS No. ^e	ppm ^a	mg/m ^{3b}	Skin De- signation	ppm ^a	mg/m ^{3b}	ppm ^a	mg/m ^{3b}	ppm ^a	mg/m ^{3b}	Skin De- signation
Hydrogen chloride	7647-01-0	(C) 5	(C) 7	–	–	–	–	–	5	7	–
Hydrogen cyanide	74-90-8	10	11	x	–	–	4.7	5	–	–	x
Hydrogen fluoride (as F)	7664-39-3	See table G-2			3	–	6	–	–	–	–
Hydrogen peroxide	7722-84-1	1	1.4	–	1	1.4	–	–	–	–	–
Hydrogen selenide (as Se)	7783-07-5	0.05	0.2	–	0.05	0.2	–	–	–	–	–
Hydrogen sulfide	7783-06-4	See table G-2			10	14	15	21	–	–	–
Hydroquinone	123-31-9	–	2	–	–	2	–	–	–	–	–
2-Hydroxypropyl acrylate	999-61-1	–	–	–	0.5	3	–	–	–	–	x
Indene	95-13-6	10	45	–	10	45	–	–	–	–	–
Indium and compounds (as In)	7440-74-6	–	0.1	–	–	0.1	–	–	–	–	–
Iodine	7553-56-2	(C) 0.1	(C) 1	–	–	–	–	–	0.1	1	–
Iodoform	75-47-8	–	–	–	0.6	10	–	–	–	–	–
Iron oxide fume	1309-37-1	–	10	–	–	10	–	–	–	–	–
Iron pentacarbonyl (as Fe)	13463-40-6	–	–	–	0.1	0.8	0.2	1.6	–	–	–
Iron salts (soluble) (as Fe)	Varies with compound	–	1	–	–	1	–	–	–	–	–
Isoamyl acetate	123-92-2	100	525	–	100	525	–	–	–	–	–
Isoamyl alcohol (primary and secondary)	123-51-3	100	360	–	100	360	125	450	–	–	–
Isobutyl acetate	110-19-0	150	700	–	150	700	–	–	–	–	–
Isobutyl alcohol	78-83-1	100	300	–	50	150	–	–	–	–	–
Isooctyl alcohol	26952-21-6	–	–	–	50	270	–	–	–	–	x
Isophorone	78-59-1	25	140	–	4	23	–	–	–	–	–
Isophorone diisocyanate	4098-71-9	–	–	–	0.005	–	0.02	–	–	–	x
2-Isopropoxyethanol	109-59-1	–	–	–	25	105	–	–	–	–	–

		PEL*			TWA		STEL ^c		Ceiling		
Substance	CAS No. ^b	ppm ^a	mg/m ^{3b}	Skin De- signation	ppm ^a	mg/m ^{3b}	ppm ^a	mg/m ^{3b}	ppm ^a	mg/m ^{3b}	Skin De- signation
Isopropyl acetate	108-21-4	250	950	-	250	950	310	1185	-	-	-
Isopropyl alcohol	67-63-0	400	980	-	400	980	500	1225	-	-	-
Isopropylamine	75-31-0	5	12	-	5	12	10	24	-	-	-
N-Isopropylaniline	768-52-5	-	-	-	2	10	-	-	-	-	x
Isopropyl ether	108-20-3	500	2100	-	500	2100	-	-	-	-	-
Isopropyl glycidyl ether (IGE)	4016-14-2	50	240	-	50	240	75	360	-	-	-
Kaolin Total dust Respirable fraction	-	-	15	-	-	10	-	-	-	-	-
		-	5	-	-	5	-	-	-	-	-
Ketene	463-51-4	0.5	0.9	-	0.5	0.9	1.5	3	-	-	-
Lead inorganic (as Pb); see R 325.51901 et seq.	7439-92-1	-	-	-	-	-	-	-	-	-	-
Limestone Total dust Respirable fraction	1317-65-3	-	15	-	-	15	-	-	-	-	-
		-	5	-	-	5	-	-	-	-	-
Lindane	58-89-9	-	0.5	x	-	0.5	-	-	-	-	x
Lithium hydride	7580-67-8	-	0.025	-	-	0.025	-	-	-	-	-
L.P.G. (Liquified petroleum gas)	68476-85-7	1000	1800	-	1000	1800	-	-	-	-	-
Magnesite Total dust Respirable fraction	546-93-0	-	15	-	-	15	-	-	-	-	-
		-	5	-	-	5	-	-	-	-	-
Magnesium oxide fume Total particulate	1309-48-4	-	15	-	-	10	-	-	-	-	-
Malathion Total dust	121-75-5	-	15	x	-	10	-	-	-	-	x
Maleic anhydride	108-31-6	0.25	1	0.25	1	-	-	-	-	-	-
Manganese compounds (as Mn)	7439-96-5	-	(C) 5	-	-	-	-	-	-	5	-
Manganese fume (as Mn)	7439-96-5	-	(C) 5	-	-	1	-	3	-	-	-
TRANSITIONAL LIMITS					FINAL RULE LIMITS**						
		PEL*			TWA		STEL ^c		Ceiling		

Substance	CAS No. ^B	ppm ^A	mg/m ^{3B}	Skin De- signation	ppm ^A	mg/m ^{3B}	ppm ^A	mg/m ^{3B}	ppm ^A	mg/m ^{3B}	Skin De- signation
Manganese cyclopentadienyl tricarbonyl (as Mn)	12079-65-1	-	-	-	-	0.1	-	-	-	-	x
Manganese tetroxide (as Mn)	1317-35-7	-	-	-	-	1	-	-	-	-	-
Marble	1317-65-3	-	15	-	-	15	-	-	-	-	-
Total dust		-	5	-	-	5	-	-	-	-	-
Respirable fraction		-			-		-		-		
Mercury (aryl and inorganic compounds) (as Hg)	7439-97-6	See table G-2			-	-	-	-	-	0.1	x
Mercury (organo) alkyl compounds (as Hg)	7439-97-6	See table G-2			-	0.01	-	0.03	-	-	x
Mercury (vapor) (as Hg)	7439-97-6	See table G-2			-	0.05	-	-	-	-	x
Mesityl oxide	141-79-7	25	100	-	15	60	25	100	-	-	-
Methacrylic acid	79-41-4	-	-	-	20	70	-	-	-	-	x
Methanethiol; see Methyl mercaptan											
Methomyl (Lannate)	16752-77-5	-	-	-	-	2.5	-	-	-	-	-
Methoxychlor Total dust	72-43-5	-	15	-	-	10	-	-	-	-	-
2-Methoxyethanol; see Methyl cellosolve											
4-Methoxyphenol	150-76-5	-	-	-	-	5	-	-	-	-	-
Methyl acetate	79-20-9	200	610	-	200	610	250	760	-	-	-
Methyl acetylene (Propyne)	74-99-7	1000	1650	-	1000	1650	-	-	-	-	-
Methyl acetylene-propadiene mixture (MAPP)	-	1000	1800	-	1000	1800	1250	2250	-	-	-
Methyl acrylate	96-33-3	10	35	x	10	35	-	-	-	-	x
Methylacrylonitrile	126-98-7	-	-	-	1	3	-	-	-	-	x

TRANSITIONAL LIMITS					FINAL RULE LIMITS**						
		PEL*			TWA		STEL ^c		Ceiling		
Substance	CAS No. ^e	ppm ^a	mg/m ^{3b}	Skin De- signation	ppm ^a	mg/m ^{3b}	ppm ^a	mg/m ^{3b}	ppm ^a	mg/m ^{3b}	Skin De- signation
Methylal (Dimethoxy-methane)	109-87-5	1000	3100	–	1000	3100	–	–	–	–	–
Methyl alcohol	67-56-1	200	260	–	200	260	250	325	–	–	x
Methylamine	74-89-5	10	12	–	10	12	–	–	–	–	–
Methyl amyl alcohol; see Methyl isobutyl carbinol											
Methyl n-amyl ketone	110-43-0	100	465	–	100	465	–	–	–	–	–
Methyl bromide	74-83-9	(C)20	(C)80	x	5	20	–	–	–	–	x
Methyl butyl ketone; see 2-Hexanone											
Methyl cellosolve (2-Methoxyethanol)	109-86-4	25	80	x	25	80	–	–	–	–	x
Methyl cellosolve acetate (2-Methoxyethyl acetate)	110-49-6	25	120	x	25	120	–	–	–	–	x
Methyl chloride	74-87-3	See table G-2			50	105	100	210	–	–	–
Methyl chloroform (1,1,1-Trichloroethane)	71-55-6	350	1900	–	350	1900	450	2450	–	–	–
Methyl 2-cyanoacrylate	137-05-3	–	–	–	2	8	4	16	–	–	–
Methylcyclohexane	108-87-2	500	2000	–	400	1600	–	–	–	–	–
Methylcyclohexanol	25639-42-3	100	470	–	50	235	–	–	–	–	–
o-Methylcyclohexanone	583-60-8	100	460	x	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-chloraniline) (MBOCA)	101-14-4	–	–	–	0.02	0.22	–	–	–	–	x
Methylene bis (4-cyclo- hexylisocyanate)	5124-30-1	–	–	–	–	–	–	–	0.01	0.11	–
TRANSITIONAL LIMITS					FINAL RULE LIMITS**						

		PEL*			TWA		STEL ^c		Ceiling		
Substance	CAS No. [®]	ppm ^a	mg/m ^{3b}	Skin De- signation	ppm ^a	mg/m ^{3b}	ppm ^a	mg/m ^{3b}	ppm ^a	mg/m ^{3b}	Skin De- signation
Methylene chloride	75-09-2	See table G-2			See table G-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	-	100	250	150	375	-	-	-
Methyl hydrazine (Mono- methyl hydrazine)	60-34-4	(C) 0.2	(C) 0.35	x	-	-	-	-	0.2	0.35	x
Methyl iodide	74-88-4	5	28	x	2	10	-	-	-	-	x
Methyl isoamyl ketone	110-12-3	100	475	-	50	240	-	-	-	-	-
Methyl isobutyl carbinol	108-11-2	25	100	x	25	100	40	165	-	-	x
Methyl isobutyl ketone; see Hexone											
Methyl isocyanate (MIC)	624-83-9	0.02	0.05	x	0.02	0.05	-	-	-	-	x
Methyl isopropyl ketone	563-80-4	-	-	-	200	705	-	-	-	-	-
Methyl mercaptan	74-93-1	(C) 10	(C) 20	-	0.5	1	-	-	-	-	-
Methyl methacrylate	80-62-6	100	410		100	410	-	-	-	-	
Methyl parathion	298-00-0	-	-	-	-	0.2	-	-	-	-	x
Methyl propyl ketone; see 2-Pentanone											
Methyl silicate	681-84-5	5	30	-	1	6	-	-	5	30	-
alpha-Methyl styrene	98-83-9	(C) 100	(C) 480	-	50	240	100	485	-	-	-
Methylene bisphenyl isocyanate (MDI)	101-68-8	(C) 0.02	(C) 0.2	-	-	-	-	-	0.02	0.2	-
Metribuzin	21087-64-9	-	-	-	-	5	-	-	-	-	-
Mica; see Silicates											
TRANSITIONAL LIMITS					FINAL RULE LIMITS**						
		PEL*			TWA		STEL ^c		Ceiling		

Substance	CAS No. ^B	ppm ^A	mg/m ^{3B}	Skin De- signation	ppm ^A	mg/m ^{3B}	ppm ^A	mg/m ^{3B}	ppm ^A	mg/m ^{3B}	Skin De- signation
Molybdenum (as Mo)	7439-98-7	-	5	-	-	5	-	-	-	-	-
Soluble compounds		-	15	-	-	10	-	-	-	-	-
Insoluble compounds		-			-		-	-	-	-	
Total dust		-			-		-	-	-	-	
Monocrotophos (Azodrin [®])	6923-22-4	-	-	-	-	0.25	-	-	-	-	-
Monomethyl aniline	100-61-8	2	9	x	0.5	2	-	-	-	-	x
Morpholine	110-91-8	20	70	x	20	70	30	105	-	-	x
Naphtha (Coal tar)	8030-30-6	100	400	-	100	400	-	-	-	-	-
Naphthalene	91-20-3	10	50	-	10	50	15	75	-	-	-
alpha-Naphthylamine; see O.H. rule 2301(10)	134-32-7										
beta-Naphthylamine; see O.H. rule 2301(11)	91-59-8										
Nickel carbonyl (as Ni)	13463-39-3	0.001	0.007	-	0.001	0.007	-	-	-	-	-
Nickel, metal and insoluble compounds (as Ni)	7440-02-0	-	1	-	-	1	-	-	-	-	-
Nickel, soluble compounds (as Ni)	7440-02-0	-	1	-	-	0.1	-	-	-	-	-
Nicotine	54-11-5	-	0.5	x	-	0.5	-	-	-	-	x
Nitric acid	7697-37-2	2	5	-	2	5	4	10	-	-	-
Nitric oxide	10102-43-9	25	30	-	25	30	-	-	-	-	-
p-Nitroaniline	100-01-6	1	6	x	-	3	-	-	-	-	x
Nitrobenzene	98-95-3	1	5	x	1	5	-	-	-	-	x
p-Nitrochlorobenzene	100-00-5	-	1	x	-	1	-	-	-	-	x
4-Nitrodiphenyl; see O.H. rule 2301(12)	92-93-3										
Nitroethane	79-24-3	100	310	-	100	310	-	-	-	-	-
TRANSITIONAL LIMITS					FINAL RULE LIMITS**						
		PEL*			TWA		STEL ^C		Ceiling		
Substance	CAS No. ^B	ppm ^A	mg/m ^{3B}	Skin De- signation	ppm ^A	mg/m ^{3B}	ppm ^A	mg/m ^{3B}	ppm ^A	mg/m ^{3B}	Skin De- signation
Nitrogen dioxide	10102-44-0	(C) 5	(C) 9	-	-	-	1	1.8	-	-	-

Nitrogen trifluoride	7783-54-2	10	29	-	10	29	-	-	-	-	-
Nitroglycerin	55-63-0	(C) 0.2	(C) 2	x	-	-	-	0.1	-	-	x
Nitromethane	75-52-5	100	250	-	100	250	-	-	-	-	-
1-Nitropropane	108-03-2	25	90	-	25	90	-	-	-	-	-
2-Nitropropane	79-46-9	25	90	-	10	35	-	-	-	-	-
N-Nitrosodimethylamine; see O.H. rule 2301(13)	62-75-9										
Nitrotoluene o-isomer m-isomer p-isomer	88-72-2; 99-08-1; 99-99-0	5	30	x	2	11	-	-	-	-	x
Nitrotrichloromethane; see Chloropicrin											
Nonane	111-84-2	-	-	-	200	1050	-	-	-	-	-
Octachloronaphthalene	2234-13-1	-	0.1	x	-	0.1	-	0.3	-	-	x
Octane	111-65-9	500	2350	-	300	1450	375	1800	-	-	-
Oil mist, mineral	8012-95-1	-	5	-	-	5	-	-	-	-	-
Osmium tetroxide (as Os)	20816-12-0	-	0.002	-	-	0.002	-	0.006	-	-	-
Oxalic acid	144-62-7	-	1	-	-	1	-	2	-	-	-
Oxygen difluoride	7783-41-7	0.05	0.1	-	-	-	-	-	0.05	0.1	-
Ozone	10028-15-6	0.1	0.2	-	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	-	0.5	x	-	0.1	-	-	-	-	x
Parathion	56-38-2	-	0.1	x	-	0.1	-	-	-	-	x
TRANSITIONAL LIMITS					FINAL RULE LIMITS**						
		PEL*			TWA		STEL ^c		Ceiling		
Substance	CAS No. ^B	ppm ^A	mg/m ^{3B}	Skin De- signation	ppm ^A	mg/m ^{3B}	ppm ^A	mg/m ^{3B}	ppm ^A	mg/m ^{3B}	Skin De- signation
Particulates not otherwise regulated	-										
Total dust	-	-	15	-	-	15	-	-	-	-	-
Respirable fraction	-	-	5	-	-	5	-	-	-	-	-

Pentaborane	19624-22-7	0.005	0.01	-	0.005	0.01	0.015	0.03	-	-	-
Pentachloronaphthalene	1321-64-8	-	0.5	x	-	0.5	-	-	-	-	x
Pentachlorophenol	87-86-5	-	0.5	x	-	0.5	-	-	-	-	x
Pentaerylthritol	115-77-5	-	15	-	-	10	-	-	-	-	-
Total dust		-	5	-	-	5	-	-	-	-	-
Respirable fraction											
Pentane	109-66-0	1000	2950	-	600	1800	750	2250	-	-	-
2-Pentanone (Methyl propyl ketone)	107-87-9	200	700	-	200	700	250	875	-	-	-
Perchloroethylene (Tetrachloroethylene)	127-18-4	See table G-2			25	170	-	-	-	-	-
Perchloromethyl mercaptan	594-42-3	0.1	0.8	-	0.1	0.8	-	-	-	-	-
Perchloryl fluoride	7616-94-6	3	13.5	-	3	14	6	28	-	-	-
Perlite	-	-	15	-	-	15	-	-	-	-	-
Total dust		-	5	-	-	5	-	-	-	-	-
Respirable fraction											
Petroleum distillates (Naphtha)		500	2000	-	400	1600	-	-	-	-	-
Phenol	108-95-2	5	19	x	5	19	-	-	-	-	x
Phenothiazine	92-84-2	-	-	-	-	5	-	-	-	-	x
p-Phenylene diamine	106-50-3	-	0.1	x	-	0.1	-	-	-	-	x
Phenyl ether, vapor	101-84-8	1	7	-	1	7	-	-	-	-	-
Phenyl ether-biphenyl mixture, vapor	-	1	7	-	1	7	-	-	-	-	-
Phenylethylene; see Styrene											
TRANSITIONAL LIMITS					FINAL RULE LIMITS**						
		PEL*			TWA		STEL ^c		Ceiling		
Substance	CAS No. ^B	ppm ^A	mg/m ^{3B}	Skin De- signation	ppm ^A	mg/m ^{3B}	ppm ^A	mg/m ^{3B}	ppm ^A	mg/m ^{3B}	Skin De- signation
Phenyl glycidyl ether (PGE)	122-60-1	10	60	-	1	6	-	-	-	-	-
Phenylhydrazine	100-63-0	5	22	x	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 ^R)	7786-34-7	-	0.1	x	-	0.1	-	0.3	-	-	x
Phosgene (Carbonyl chloride)	75-44-5	0.1	0.4	-	0.1	0.4	-	-	-	-	-
Phosphine	7803-51-2	0.3	0.4	-	0.3	0.4	1	1	-	-	-
Phosphoric acid	7664-38-2	-	1	-	-	1	-	3	-	-	-
Phosphorus (yellow)	7723-14-0	-	0.1	-	-	0.1	-	-	-	-	-
Phosphorus oxychloride	10025-87-3	-	-	-	0.1	0.6	-	-	-	-	-
Phosphorus pentachloride	10026-13-8	-	1	-	-	1	-	-	-	-	-
Phosphorus pentasulfide	1314-80-3	-	1	-	-	1	-	3	-	-	-
Phosphorus trichloride	7719-12-2	0.5	3	-	0.2	1.5	0.5	3	-	-	-
Phthalic anhydride	85-44-9	2	12	-	1	6	-	-	-	-	-
m-Phthalodinitrile	626-17-5	-	-	-	-	5	-	-	-	-	-
Picloram Total dust Respirable fraction	1918-02-1	- -	15 5	- -	- -	10 5	- -	- -	- -	- -	- -
Picric acid	88-89-1	-	0.1	x	-	0.1	-	-	-	-	x
Piperazine dihydrochloride	142-64-3	-	-	-	-	5	-	-	-	-	-
Pindone (2-Pivalyl-1,3-indandione)	83-26-1	-	0.1	-	-	0.1	-	-	-	-	-
Plaster of Paris Total dust Respirable fraction	26499-65-0	- -	15 5	- -	- -	15 5	- -	- -	- -	- -	- -
TRANSITIONAL LIMITS					FINAL RULE LIMITS**						
		PEL*			TWA		STEL ^C		Ceiling		
Substance	CAS No. ^B	ppm ^A	mg/m ^{3B}	Skin De- signation	ppm ^A	mg/m ^{3B}	ppm ^A	mg/m ^{3B}	ppm ^A	mg/m ^{3B}	Skin De- signation
Platinum (as Pt) Metal Soluble salts	7440-06-4	- -	- 0.002	- -	- -	1 0.002	- -	- -	- -	- -	- -
Portland cement Total dust Respirable fraction	65997-15-1	See table G-3 See table G-3			- -	10 5	- -	- -	- -	- -	- -
Potassium hydroxide	1310-58-3	-	-	-	-	-	-	-	-	2	-
Propane	74-98-6	1000	1800	-	1000	1800	-	-	-	-	-
Propargyl alcohol	107-19-7	-	-	-	1	2	-	-	-	-	x

beta-Propriolactone; see O.H. rule 2301(14)	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	-	200	840	250	1050	-	-	-
n-Propyl alcohol	71-23-8	200	500	-	200	500	250	625	-	-	-
n-Propyl nitrate	627-13-4	25	110	-	25	105	40	170	-	-	-
Propylene dichloride	78-87-5	75	350	-	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	-	-	-
Propylene imine	75-55-8	2	5	x	2	5	-	-	-	-	x
Propylene oxide	75-56-9	100	240	-	20	50	-	-	-	-	-
Propyne; see Methyl acetylene											
Pyrethrum	8003-34-7	-	5	-	-	5	-	-	-	-	-
Pyridine	110-86-1	5	15	-	5	15	-	-	-	-	-
Quinone	106-51-4	0.1	0.4	-	0.1	0.4	-	-	-	-	-
Resorcinol	108-46-3	-	-	-	10	45	20	90	-	-	-
TRANSITIONAL LIMITS					FINAL RULE LIMITS**						
		PEL*			TWA		STEL ^c		Ceiling		
Substance	CAS No. ^B	ppm ^A	mg/m ^{3B}	Skin De- signation	ppm ^A	mg/m ^{3B}	ppm ^A	mg/m ^{3B}	ppm ^A	mg/m ^{3B}	Skin De- signation
Rhodium (as Rh), metal fume and insoluble compounds	7440-16-6	-	0.1	-	-	0.1	-	-	-	-	-
Rhodium (as Rh), soluble compounds	7440-16-6	-	0.001	-	-	0.001	-	-	-	-	-
Ronnel	299-84-3	-	15	-	-	10	-	-	-	-	-
Rosin core solder pyrolysis products, as formaldehyde	-	-	-	-	-	0.1	-	-	-	-	-
Rotenone	83-79-4	-	5	-	-	5	-	-	-	-	-

Rouge Total dust Respirable fraction		-	-	15 5	- -	- -	10 5	- -	- -	- -	- -	
Selenium compounds (as Se)		7782-49-2	-	0.2	-	-	0.2	-	-	-	-	
Selenium hexafluoride (as Se)		7783-79-1	0.05	0.4	-	0.05	0.4	-	-	-	-	
Silica, amorphous, precipitated and gel		112926-00-8	See table G-3			-	6	-	-	-	-	
Silica, amorphous, diatomaceous earth, containing less than 1% crystalline silica		61790-53-2	See table G-3			-	6	-	-	-	-	
Silica, crystalline cristobalite (as quartz) respirable dust		14464-46-1	See table G-3			-	0.05	-	-	-	-	
Silica, crystalline quartz (as quartz), respirable dust		14808-60-7	See table G-3			-	0.1	-	-	-	-	
Silica, crystalline tripoli (as quartz), respirable dust		1317-95-9	See table G-3			-	0.1	-	-	-	-	
Silica, crystalline tridymite (as quartz), respirable dust		15468-32-3	See table G-3			-	0.05	-	-	-	-	
Silica, fused, respirable dust		60676-86-0	See table G-3			-	0.1	-	-	-	-	
TRANSITIONAL LIMITS						FINAL RULE LIMITS**						
			PEL*			TWA		STEL ^c		Ceiling		
Substance		CAS No. [®]	ppm ^A	mg/m ^{3B}	Skin De- signation	ppm ^A	mg/m ^{3B}	ppm ^A	mg/m ^{3B}	ppm ^A	mg/m ^{3B}	Skin De- signation
Silicates (less than 1% crystalline silica)												
	Mica (respirable dust)	12001-26-2	See table G-3			-	3	-	-	-	-	-
	Soapstone, total dust	-	See table G-3			-	6	-	-	-	-	-
	Soapstone, respirable dust	-	See table G-3			-	3	-	-	-	-	-
	Talc (containing asbestos); use asbestos limit	-	See table G-3			O.H. rule 2205						
	Talc (containing no asbestos), respirable dust	14807-96-6	See table G-3			-	2	-	-	-	-	-
	Tremolite	See table G-3				O.H. rule 2205						

Silicon	7440-21-3	-	15	-	-	10	-	-	-	-	-
Total dust		-	5	-	-	5	-	-	-	-	-
Respirable fraction		-		-	-		-	-	-	-	-
Silicon carbide	409-21-2	-	15	-	-	10	-	-	-	-	-
Total dust		-	5	-	-	5	-	-	-	-	-
Respirable fraction		-		-	-		-	-	-	-	-
Silicon tetrahydride	7803-62-5	-	-	-	5	7	-	-	-	-	-
Silver, metal and soluble compounds (as Ag)	7440-22-4	-	0.01	-	-	0.01	-	-	-	-	-
Soapstone; see Silicates											
Sodium azide	26628-22-8	-	-	-	-	-	-	-	0.1	-	x
(as HN ₃)		-	-	-	-	-	-	-	-	0.3	x
(as NaN ₃)		-	-	-	-	-	-	-	-	-	-
Sodium bisulfite	7631-90-5	-	-	-	-	5	-	-	-	-	-
Sodium fluoroacetate	62-74-8	-	0.05	x	-	0.05	-	0.15	-	-	x
Sodium hydroxide	1310-73-2	-	2	-	-	-	-	-	-	2	-
Sodium metabisulfite	7681-57-4	-	-	-	-	5	-	-	-	-	-

TRANSITIONAL LIMITS					FINAL RULE LIMITS**						
		PEL*			TWA		STEL ^c		Ceiling		
Substance	CAS No. ^B	ppm ^A	mg/m ^{3B}	Skin De- signation	ppm ^A	mg/m ^{3B}	ppm ^A	mg/m ^{3B}	ppm ^A	mg/m ^{3B}	Skin De- signation
Starch	9005-25-8	-	15	-	-	15	-	-	-	-	-
Total dust		-	5	-	-	5	-	-	-	-	-
Respirable fraction											
Stibine	7803-52-3	0.1	0.5	-	0.1	0.5	-	-	-	-	-
Stoddard solvent	8052-41-3	500	2900	-	100	525	-	-	-	-	-
Strychnine	57-24-9	-	0.15	-	-	0.15	-	-	-	-	-
Styrene	100-42-5	See table G-2			50	215	100	425	-	-	-
Subtilisins (Proteolytic enzymes)	9014-01-1	-	-	-	-	-	-	0.00006 (60 min.)	-	-	-
Sucrose	57-50-1	-	15	-	-	15	-	-	-	-	-
Total dust		-	5	-	-	5	-	-	-	-	-
Respirable fraction											
Sulfur dioxide	7446-09-5	5	13	-	2	5	5	10	-	-	-
Sulfur hexafluoride	2551-62-4	1000	6000	-	1000	6000	-	-	-	-	-
Sulfuric acid	7664-93-9	-	1	-	-	1	-	-	-	-	-
Sulfur monochloride	10025-67-9	1	6	-	-	-	-	-	1	6	-
Sulfur pentafluoride	5714-22-7	0.025	0.25	-	-	-	-	-	0.01	0.1	-
Sulfur tetrafluoride	7783-60-0	-	-	-	-	-	-	-	0.1	0.4	-
Sulfuryl fluoride	2699-79-8	5	20	-	5	20	10	40	-	-	-
Sulprofos	35400-43-2	-	-	-	-	1	-	-	-	-	-
Systox ^B ; see Demeton											
2,4,5-T	93-76-5	-	10	-	-	10	-	-	-	-	-
Talc; see Silicates											
Tantalum, metal and oxide dust	7440-25-7	-	5	-	-	5	-	-	-	-	-
TEDP (Sulfotep)	3689-24-5	-	0.2	x	-	0.2	-	-	-	-	x

TRANSITIONAL LIMITS					FINAL RULE LIMITS**						
		PEL*			TWA		STEL ^c		Ceiling		
Substance	CAS No. ^B	ppm ^A	mg/m ^{3B}	Skin De- signation	ppm ^A	mg/m ^{3B}	ppm ^A	mg/m ^{3B}	ppm ^A	mg/m ^{3B}	Skin De- signation
Tellurium and compounds (as Te)	13494-80-9	-	0.1	-	-	0.1	-	-	-	-	-
Tellurium hexafluoride (as Te)	7783-80-4	0.02	0.2	-	0.02	0.2	-	-	-	-	-
Temephos Total dust Respirable fraction	3383-96-8	-	15	-	-	10	-	-	-	-	-
		-	5	-	-	5	-	-	-	-	-
TEPP	107-49-3	-	0.05	x	-	0.05	-	-	-	-	x
Terphenyls	26140-60-3	(C)1	(C)9	-	-	-	-	-	0.5	5	-
1,1,1,2-Tetrachloro-2, 2-difluoroethane	76-11-9	500	4170	-	500	4170	-	-	-	-	-
1,1,2,2-Tetrachloro-1, 2-difluoroethane	76-12-0	500	4170	-	500	4170	-	-	-	-	-
1,1,2,2-Tetachloroethane	79-34-5	5	35	x	1	7	-	-	-	-	x
Tetrachloroethylene; see Perchloroethylene											
Tetrachloromethane; see Carbon tetrachloride											
Tetrachloronaphthalene	1335-88-2	-	2	x	-	2	-	-	-	-	x
Tetraethyl lead (as Pb)	78-00-2	-	0.075	x	-	0.075	-	-	-	-	x
Tetrahydrofuran	109-99-9	200	590	-	200	590	250	735	-	-	-
Tetramethyl lead (as Pb)	75-74-1	-	0.075	x	-	0.075	-	-	-	-	x
Tetramethyl succinonitrile	3333-52-6	0.5	3	x	0.5	3	-	-	-	-	x
Tetranitromethane	509-14-8	1	8	-	1	8	-	-	-	-	-
Tetrasodium pyrophosphate	7722-88-5	-	-	-	-	5	-	-	-	-	-
Tetryl (2,4,6-Trinitro- phenyl-methyl-nitramine)	479-45-8	-	1.5	x	-	1.5	-	-	-	-	x

TRANSITIONAL LIMITS					FINAL RULE LIMITS**						
		PEL*			TWA		STEL ^c		Ceiling		
Substance	CAS No. ^e	ppm ^a	mg/m ^{3b}	Skin De- signation	ppm ^a	mg/m ^{3b}	ppm ^a	mg/m ^{3b}	ppm ^a	mg/m ^{3b}	Skin De- signation
Thallium, soluble compounds (as Tl)	7440-28-0	–	0.1	x	–	0.1	–	–	–	–	x
4,4'-Thiobis (6-tert, Butyl-m-cresol)	96-69-5	–	15	–	–	10	–	–	–	–	–
Total dust		–	5	–	–	5	–	–	–	–	–
Respirable fraction		–									
Thioglycolic acid	68-11-1	–	–	–	1	4	–	–	–	–	x
Thionyl chloride	7719-09-7	–	–	–	–	–	–	–	1	5	–
Thiram	137-26-8	–	5	–	–	5	–	–	–	–	–
Tin, inorganic compounds (except oxides) (as Sn)	7440-31-5	–	2	–	–	2	–	–	–	–	–
Tin, organic compounds (as Sn)	7440-31-5	–	0.1	–	–	0.1	–	–	–	–	x
Tin oxide (as Sn)	21651-19-4	–	–	–	–	2	–	–	–	–	–
Titanium dioxide	13463-67-7	–	15	–	–	10	–	–	–	–	–
Total dust											
Toluene	108-88-3	See table G-2			100	375	150	560	–	–	–
Toluene-2,4-diisocyanate (TDI)	584-84-9	(C) 0.02	(C) 0.14	–	0.005	0.04	0.02	0.15	–	–	–
m-Toluidine	108-44-1	–	–	–	2	9	–	–	–	–	x
o-Toluidine	95-53-4	5	22	x	5	22	–	–	–	–	x
p-Toluidine	106-49-0	–	–	–	2	9	–	–	–	–	x
Toxaphene; see Chlorinated camphene											
Tremolite; see Silicates											
Tributyl phosphate	126-73-8	–	5	–	0.2	2.5	–	–	–	–	–
Trichloroacetic acid	76-03-9	–	–	–	1	7	–	–	–	–	–
1,2,4-Trichlorobenzene	120-82-1	–	–	–	–	–	–	–	5	40	–

TRANSITIONAL LIMITS					FINAL RULE LIMITS**						
		PEL*			TWA		STEL ^c		Ceiling		
Substance	CAS No. ^e	ppm ^a	mg/m ^{3b}	Skin De- signation	ppm ^a	mg/m ^{3b}	ppm ^a	mg/m ^{3b}	ppm ^a	mg/m ^{3b}	Skin De- signation
1,1,1-Trichloroethane; see Methyl chloroform											
1,1,2-Trichloroethane	79-00-5	10	45	x	10	45	–	–	–	–	x
Trichloroethylene	79-01-6	See table G-2			50	270	200	1080	–	–	–
Trichloromethane; see Chloroform											
Trichloronaphthalene	1321-65-9	–	5	x	–	5	–	–	–	–	x
1,2,3-Trichloropropane	96-18-4	50	300	–	10	60	–	–	–	–	–
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	1000	7600	–	1000	7600	1250	9500	–	–	–
Triethylamine	121-77-8	25	100	–	10	40	15	60	–	–	–
Trifluorobromomethane	75-63-8	1000	6100	–	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	–	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	–	1.5	x	–	0.5	–	–	–	–	x
Triorthocresyl phosphate	78-30-8	–	0.1	–	–	0.1	–	–	–	–	x
Triphenyl amine	603-34-9	–	–	–	–	5	–	–	–	–	–
Triphenyl phosphate	115-86-6	–	3	–	–	3	–	–	–	–	–
Tungsten (as W)	7440-33-7	–	5	–	–	5	–	10	–	–	–
Insoluble compounds		–	1	–	–	1	–	3	–	–	–
Soluble compounds											
Turpentine	8006-64-2	100	560	–	100	560	–	–	–	–	–
TRANSITIONAL LIMITS					FINAL RULE LIMITS**						

		PEL*			TWA		STEL ^c		Ceiling		
Substance	CAS No. ^e	ppm ^a	mg/m ^{3b}	Skin De- signation	ppm ^a	mg/m ^{3b}	ppm ^a	mg/m ^{3b}	ppm ^a	mg/m ^{3b}	Skin De- signation
Uranium (as U)	7440-61-1	-	0.05	-	-	0.05	-	-	-	-	-
Soluble compounds		-	0.25	-	-	0.2	-	0.6	-	-	-
Insoluble compounds											
n-Valeraldehyde	110-62-3	-	-	-	50	175	-	-	-	-	-
Vanadium (as V ₂ O ₅)	1314-62-1	-	(C) 0.5	-	-	0.05	-	-	-	-	-
Respirable dust		-	(C) 0.1	-	-	0.05	-	-	-	-	-
Fume											
Vegetable oil mist	-	-	15	-	-	15	-	-	-	-	-
Total dust		-	5	-	-	5	-	-	-	-	-
Respirable fraction											
Vinyl acetate	108-05-4	-	-	-	10	30	20	60	-	-	-
Vinyl benzene; see Styrene											
Vinyl bromide	593-60-2	-	-	-	5	20	-	-	-	-	-
Vinyl chloride see O.H. rule 2260	75-01-4										
Vinylcyanide; 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	-	100	480	-	-	-	-	-
VM & P Naphtha	8032-32-4	-	-	-	300	1350	400	1800	-	-	-
Warfarin	81-81-2	-	0.1	-	-	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	-	-	-	-	-

TRANSITIONAL LIMITS					FINAL RULE LIMITS**						
		PEL*			TWA		STEL ^c		Ceiling		
Substance	CAS No. ^B	ppm ^A	mg/m ^{3B}	Skin De- signation	ppm ^A	mg/m ^{3B}	ppm ^A	mg/m ^{3B}	ppm ^A	mg/m ^{3B}	Skin De- signation
Xylenes (o-,m-,p-isomers)	1330-20-7	100	435	-	100	435	150	655	-	-	-
m-Xylene alpha, alpha'-diamine	1477-55-0	-	-	-	-	-	-	-	-	0.1	x
Xylidine	1300-73-8	5	25	x	2	10	-	-	-	-	x
Yttrium	7440-65-5	-	1	-	-	1	-	-	-	-	-
Zinc chloride fume	7646-85-7	-	1	-	-	1	-	2	-	-	-
Zinc chromate (as CrO ₃)	Varies with compound	See table G-2			-	-	-	-	-	0.1	-
Zinc oxide fume	1314-13-2	-	5	-	-	5	-	10	-	-	-
Zinc oxide Total dust Respirable fraction	1314-13-2	-	15	-	-	10	-	-	-	-	-
		-	5	-	-	5	-	-	-	-	-
Zinc stearate Total dust Respirable fraction	557-05-1	-	15	-	-	10	-	-	-	-	-
		-	5	-	-	5	-	-	-	-	-
Zirconium compounds (as Zr)	7440-67-7	-	5	-	-	5	-	10	-	-	-

* The transitional PELs are 8-hour TWAs unless otherwise noted; a (C) designation denotes a ceiling limit.

** Unless otherwise noted, employers in general industry may use any combination of controls to achieve these limits as noted in R 325.51106 for a period of not more than 4 years from the effective date of these rules.

*** As determined from breathing-zone air samples.

A Parts of vapor or gas per million parts of contaminated air by volume at 25°C and 760 torr.

B Approximate milligrams of substance per cubic meter of air.

C Duration is for 15 minutes, unless otherwise noted.

D The final benzene standard in R 325.77101 et seq. applies to all occupational exposures to benzene, except some subsegments of industry where exposures are consistently under the action level. These subsegments include the distribution and sale of fuels, sealed containers and pipelines, coke production, oil and gas drilling and production, natural gas processing, and the percentage exclusion for liquid mixtures. For the excepted subsegments, the benzene limits in table G-2 apply.

E The CAS number is for information only. Enforcement is based on the substance name. For an entry covering more than 1 metal compound measured as the metal, the CAS number for the metal is given - not the CAS number for the individual compounds.

TABLE G-2

Material	8-hour, time weighted average	Acceptable ceiling concentration	Acceptable maximum peak above the acceptable ceiling concentration for an 8-hour shift.	
			Concentration	Maximum duration
S Benzene	10 p.p.m.	25 p.p.m.	50	10 minutes
Beryllium and beryllium compounds	2 $\mu\text{g}/\text{m}^3$	5 $\mu\text{g}/\text{m}^3$	25 $\mu\text{g}/\text{m}^3$	30 minutes
Cadmium fume	0.1 mg/m^3	0.3 mg/m^3		
Cadmium dust	0.2 mg/m^3	0.6 mg/m^3		
S Carbon disulfate	20 p.p.m.	30 p.p.m.	100 p.p.m.	30 minutes
S Carbon Tetrachloride	10 p.p.m.	25 p.p.m.	200 p.p.m.	5 minutes in any 4 hours
Chromic acid and chromates	0.1 mg/m^3			
S Ethylene dibromide	20 p.p.m.	30 p.p.m.	50 p.p.m.	5 minutes
Ethylene dichloride	50 p.p.m.	100 p.p.m.	200 p.p.m.	5 minutes in any 3 hours
Formaldehyde	3 p.p.m.	5 p.p.m.	10 p.p.m.	30 minutes
Fluoride as dust	2.5 mg/m^3			
Hydrogen fluoride	3 p.p.m.			
Hydrogen sulfide	10 p.p.m. (a)	20 p.p.m.	50 p.p.m.	10 minutes once only if no other measurable exposure occurs
Methyl chloride	100 p.p.m.	200 p.p.m.	300 p.p.m.	5 minutes in any 3 hours
Methylene Chloride	500 p.p.m.	1,000 p.p.m.	2,000 p.p.m.	5 minutes in any 2 hours
S Mercury	0.1 mg/m^3			
S Mercury organo (alkyl)	0.01 mg/m^3	0.04 mg/m^3		
Styrene	100 p.p.m.	200 p.p.m.	600 p.p.m.	5 minutes in any 3 hours
Tetrachloroethylene	100 p.p.m.	200 p.p.m.	300 p.p.m.	5 minutes in any 3 hours
Trichloroethylene	100 p.p.m.	200 p.p.m.	300 p.p.m.	5 minutes in any 2 hours
Toluene	200 p.p.m.	300 p.p.m.	500 p.p.m.	10 minutes

Note: **S** above signifies that skin contact shall not be allowed.

TABLE G-3-MINERAL DUSTS

Substance		mppcf ^(a)	mg/m ³
Silica:			
Crystalline:			
	Quartz (respirable)	$\frac{250^{(b)}}{\%SiO_2+5}$	$\frac{10 \text{ mg/m}^3^{(c)}}{\%SiO_2+2}$
	Quartz (total dust)		$\frac{30 \text{ mg/m}^3}{\%SiO_2+2}$
	Crisotbalite: Use $\frac{1}{2}$ the value calculated from the count or mass formulae for quartz.		
	Tridymite: Use $\frac{1}{2}$ the value calculated from the formulae for quartz.		
Amorphous, including natural diatomaceous earth		20	
Silicates (less than 1% crystalline silica):			
	Asbestos	See Rule 2205	
	Mica	20	
	Soapstone	20	
	Talc (non-asbestos-form)	20 ^(d)	
	Talc (fibrous)	Use asbestos limit	
	Tremolite (see talc, fibrous)		
	Portland cement	50	
Graphite (natural)		15	
Coal dust (respirable fraction less than 5% SiO ₂ ^(E)) Coal dust (respirable fraction more than 5% SiO ₂ ^(e))			2.4 mg/m ³ or $\frac{10 \text{ mg/m}^3}{\%SiO_2+2}$
Inert or Nuisance Dust ^(f)			
Respirable fraction		15	5 mg/m ³
Total dust		5	15 mg/m ³

Note: Conversion factors - mppcf x 35.3 = million particles per cubic meter = particles per c.c.

a Millions of particles per cubic foot of air, based on impinger samples counted by light field techniques.

b The percentage of crystalline silica in the formula is the amount determined from airborne samples, except in those instances in which other methods have been shown to be applicable.

c Both concentration and percent quartz for the application of this limit are to be determined from the fraction passing a size selector with the following characteristics:

<u>Aerodynamic diameter (unit density sphere)</u>	<u>Percent passing selector</u>
2	90
2.5	75
3.5	50
5.0	25
10	0

d Containing <1% quartz; if > 1% quartz, use quartz limit.

e The measurements under this note refer to the use of an AEC instrument. If the respirable fraction of coal dust is determined with a MRE, the figure corresponding to that of 2.4 mg/m³ in the table for coal dust is 4.5 mg/m³

f The following are some examples of inert or nuisance particles when toxic impurities are not present; for example, quartz less than 1%.

Alundum (Al ₂ O ₃)	Gypsum	Pentaerythritol
Calcium carbonate	Vegetable oil mists	Plaster of Paris
Cellulose	(except castor, cashew	Rouge
Portland cement	nut, or similar irritant	Silicon carbide
Corundum (Al ₂ O ₃)	oils)	Starch
Emery	Limestone	Sucrose
Glycerine mist	Magnesite	Tin oxide
Graphite (synthetic)	Marble	Titanium dioxide