HAWAII ADMINISTRATIVE RULES

TITLE 12

DEPARTMENT OF LABOR AND INDUSTRIAL RELATIONS

SUBTITLE 8

HAWAII OCCUPATIONAL SAFETY AND HEALTH DIVISION

PART 2

GENERAL INDUSTRY STANDARDS

CHAPTER 60

GENERAL SAFETY AND HEALTH REQUIREMENTS

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Historical note: Chapter 60 of title 12 is based upon chapter 201 of the Hawaii Occupational Safety and Health Standards, Rules and Regulations. [Eff 7/11/74; am 6/7/76; am 12/30/76; am 8/22/77; R 12/6/82]

§12-60-1 Application. The general provisions of these standards shall not be used when there are more specific provisions in other sections of the standards. [Eff 12/6/82; am 8/16/84] (Auth: HRS §396-4) (Imp: HRS §396-4)

§12-60-2 Safety and health programs. (a) Scope and application. This standard shall apply to all employers with employees doing business in the State.

(1) Every employer shall comply with the state laws, standards, and rules regarding a safe place of employment and safe practices, and shall do everything reasonable and necessary to protect the life, safety, and health of the employees.

(2) Employers involved with construction or related activities shall provide safe and healthful work places and practices that protect the employees and the affected general public as well.

(3) Every employer shall provide safe work places and practices by elimination or reduction of existing or potential hazards. Elimination of existing or potential hazards by design, process substitution, or other appropriate methods is preferred because it eliminates the need for further employee protection. When elimination is not feasible, reduction of existing or potential hazards to acceptable levels, using methods such as engineering

or administrative controls, isolation, or guarding, shall be promptly used. When these methods are inadequate to reach acceptable levels, personal protective equipment shall be provided and used.

Exception: Employers with less than 25 employees need not comply with (b)(1) below.

(b) Employer duties and responsibilities. An employer subject to this standard shall meet the following requirements:

(1) Written safety and health program.

(A) The employer shall institute and maintain an effective safety and health program to identify, evaluate and control workplace hazards. Employer safety and health programs which were developed prior to the promulgation of this standard may be used to satisfy this requirement so long as they meet the criteria for an acceptable program set forth in (B) below.

(B) The program should

(i) Set forth policies, procedures, and practices that recognize and protect employees from occupational safety and health hazards.

(ii) Establish and communicate a clear goal for the safety and health program and the mechanisms which will be utilized in meeting this goal.

(iii) Provide for visible top management leadership in implementing the program and ensure that all workers at the site, including contract workers, are provided equally high quality safety and health protection, so that all will understand that management's commitment is serious.

(iv) Provide for and encourage employee involvement in the structure and operation of the program and in decisions that affect their safety and health, so that they will commit their insight and energy to achieving the safety and health program's goal and objectives. Involvement shall be accomplished through employee collective bargaining units, where appropriate.

(v) Assign and communicate responsibilities for all aspects of the safety and loss prevention program to managers, supervisors, and employees so that they all know and understand what is expected of them in the implementation of the program.

(vi) Provide a system to hold managers, supervisors, and employees accountable for their responsibilities under the safety and health program.

(vii) Provide a reliable system for employees to notify management personnel or safety and health committee members of conditions that appear hazardous or of non-compliance with the terms of the safety and health program without fear of reprisal and provide a mechanism to ensure timely and appropriate responses to correct these conditions.

(viii) Provide a mechanism to investigate accidents and "near miss" incidents, so that the root cause and means for preventing a recurrence are identified. For the purposes of this rule, the term "accident" means any unexpected happening that interrupts the work sequence or process and that may result in injury, illness, or property damage.

(ix) Provide a means to review injury and illness trends over time, so that patterns with common causes can be identified and eliminated.

(x) Establish a mechanism for the employer to conduct ongoing, periodic in-house safety and health inspections so that new or previously missed hazards or failures in controls are identified. Inspections shall be conducted with a frequency necessary to be effective.

(xi) Address the impact of emergency situations and develop written plans and procedures to insure employee safety during emergencies. For the purpose of this standard, the term "emergency situation" means an unforeseen single event or combination of events that calls for immediate action to prevent, control or contain injury or illness to person or damage to property.

(xii) Establish procedures for transmitting and enforcing safe work practices in the workplace through training, positive reinforcement, as a reward system, public recognition, etc., correction of unsafe performance, and, if necessary, reinforcement of work practices through a clearly defined and communicated disciplinary system.

(C) The program shall be made available to the employees or their collective bargaining agent or both, upon request.

(2) Safe work practices.

(A) The employer shall eliminate or control all existing and potential hazards within the workplace in a timely manner, using one or more of the following:

(i) Engineering and work practice controls designed to control employee exposures to safety and health hazards by modifying the source to reduce exposure.

(ii) Administrative controls designed to control employee exposure to safety and health hazards.

(iii) Requirements for the distribution and proper use of personal protective equipment.

(iv) A program of medical examinations or evaluations conducted by a qualified physician or health practitioner when required by a standard.

(B) The employer shall ensure that practices are understood by all employees and are underscored through training, positive reinforcement, correction of unsafe performance, and, if necessary, through a clearly defined and communicated disciplinary system.

(3) Periodic inspections. The employer shall conduct periodic in-house safety and health inspections so that new or previously missed hazards or failures in engineering, work practice, and administrative controls are identified. The in-house inspections will be conducted by individuals who are trained to recognize hazardous conditions, as members of the safety and health committee or a person designated and trained by the employer for the facility's safety and health program.

(4) Safety and health training.

(A) The employer shall develop and institute a safety and health training program for all employees so they have an understanding of the hazards to which they may be exposed, and the procedures or practices needed to protect them from these hazards.

(B) In addition, supervisors and managers shall be trained in the elements of the employer's safety and health program and in the specific responsibilities assigned to them under the program.

(C) The employer shall ensure that the supervisors and managers understand their responsibilities under the safety and health program and their importance to the safety and health of the workplace. In particular, the training for managers and supervisors shall enable them to:

(i) Recognize potential hazards;

(ii) Maintain safety and health protection in the work area; and

(iii) Reinforce employee training on the nature of the potential hazards and required protective measures.

(c) The use of any machinery, tool, material, or equipment which is not in compliance with any applicable requirement of these standards is prohibited. The machine, tool, material, or equipment shall either be identified as unsafe by tagging or locking the controls to render them inoperable or shall be physically removed from its place of operation.

(d) The employer shall permit only those employees qualified by training or experience to operate equipment and machinery.

(e) For procedures in reporting accidents, consult section 12-52-8.

(f) All safety devices and safeguards in use shall be kept sound and operable.

(g) Any employee having knowledge of the existence of any unsafe device, practice, operation, safeguard, equipment, or condition shall promptly inform the supervisor or person in charge. A supervisor or person in charge to whose attention the existence of any unsafe device, practice, operation, safeguard, equipment, or condition is called shall take immediate steps to correct the unsafe condition or practice. [Eff 12/6/82; am 8/16/84; am 9/21/96] (Auth: HRS §396-4) (Imp: HRS §396-4)

§12-60-3 Employee responsibilities. The employee shall not knowingly perform work in an unsafe manner or in an unsafe environment without the safeguards provided for in these standards. The employee shall not tamper with or render ineffective any safety device or safeguard and shall use the safety devices provided for personal protection. [Eff. 12/6/82] (Auth: HRS §396-4) (Imp: HRS §396-4)

§12-60-4 Removal of safety devices. No person shall remove, displace, damage, destroy, or carry off any safety device, safeguard, notice, or warning furnished for use in any employment or place of employment. [Eff. 12/6/82] (Auth: HRS §396-4) (Imp: HRS §396-4)

§12-60-5 Use of intoxicants or drugs. The use of intoxicants or harmful drugs while on duty is prohibited. No person shall be permitted to work under the influence of liquor or drugs and shall be removed from the work premises if found under the influence of liquor or drugs. [Eff. 12/6/82] (Auth: HRS §396-4) (Imp: HRS §396-4)

§**12-60-6 Requirements of competence.** When work is to be performed by or under the supervision of a designated person, that person shall have the degree of competence necessary to perform or direct the work in a safe

manner. [Eff. 12/6/82] (Auth: HRS §396-4) (Imp: HRS §396-4)

§12-60-7 Requirement of quality. Materials, devices, structures and methods and procedures of operation which are required by these standards, and which are described by general descriptive terms such as adequate, proper, sufficient and the like, shall be of such kind and quality as a reasonable and prudent person experienced in the work would require in order to effect a safe operation. [Eff. 12/6/82] (Auth: HRS §396-4) (Imp: HRS §396-4)

§12-60-8 thru 12-60-49 Reserved.

§12-60-50 Standards. (a)Incorporation of federal standard. Title 29, Part 1910 of the Code of Federal Regulations, 2011 Edition published as of July 1, 2011, by the U.S. Government Printing Office, U.S. Superintendent of Documents, Washington, DC 20402-0001, is made a part of this chapter except as provided in subsection (b). Title 29, Code of Federal Regulations, Part 1910 entitled “General Working Conditions in Shipyard Employment; Final Rules” published by the Office of the Federal Register, National Archives and Records Administration on May 2, 2011, July 25, 2011, and “Standards Improvement Project – Phase III” published by the Office of the Federal Register, National Archives and Records Administration, on June 8, 2011, are made a part of this chapter.

(b)State specific definitions. The following definitions are in addition to those found in section 12-50-2 and subsection (a). Where a definition exists in both subsection (a) and this subsection, the definition contained in this subsection supersedes the definition in subsection (a). This State’s adoption of 29 CFR Part 1910.2, Definitions, is amended by adding the following definitions:

“Access" means the right and opportunity to examine and copy.

"Analysis using exposure or medical records" means any compilation of data, or any research, or statistical or other studies based at least in part on information collected from individual employee exposure or medical records or information collected from health insurance claims records, provided that either the analysis has been reported to the employer or no further work is currently being done by the person responsible for preparing the analysis.

"ANSI Z9.2" means ANSI Z9.2-1979, Fundamentals Governing the Design and Operation of Local Exhaust Systems.

"ANSI Z88.2" means ANSI Z88.2-1984, Practices for Respiratory Protection.

"Coal tar pitch volatiles" mean, as used in Exhibit A, the fused polycyclic hydrocarbons which volatilize from the distillation residues of coal, petroleum (excluding asphalt, CAS 8052-42-4 and CAS 64742-93-4), wood, and other organic matter.

"Designated representative,” means any individual or organization to whom an employee gives written authorization to exercise a right of access. For the purpose of access to employee exposure records and analyses using exposure or medical records, a recognized or certified collective-bargaining agent shall be treated automatically as a designated representative without regard to written employee authorization.

"Employee exposure record" means a record containing any of the following kinds of information:

(1) Environmental (workplace) monitoring or measuring of a toxic substance or a harmful physical agent, including personal, area, grab, or wipe sampling, or any other form of sampling, as well as related collection and analytical methodologies, calculations, and other background data relevant to interpretation of the results obtained;
(2) Biological monitoring results which directly assess the absorption of a substance or agent by body systems (e.g., the level of a chemical in the blood, urine, breath, hair, fingernails, etc.) but not including results which assess the biological effect of a substance or agent or which assess an employee's use of alcohol or drugs;
(3) Material safety-data sheets; and
(4) A chemical inventory or any other record which reveals where and when used and the identity (e.g., chemical, common, or trade name) of a toxic substance or harmful physical agent.

"Employee medical record" means a record concerning the health status of an employee, which is made or maintained by a physician or nurse, or any other health care personnel or technician, including:
(1) Medical and employment questionnaires or histories (including job description and occupational exposures);
(2) The results of medical examinations (pre-employment, pre-assignment, periodic, or episodic) and laboratory tests (including chest and other X-ray examinations taken for the purposes of establishing a base-line or detecting occupational illness, and all biological monitoring not defined as an "employee exposure record");
(3) Medical opinions, diagnoses, progress notes, and recommendations;
(4) Descriptions of treatments and prescriptions;
(5) First-aid records; and
(6) Employee medical complaints; but does not include medical information in the form of:
(A) Physical specimens (e.g., blood or urine samples) which are routinely discarded as a part of normal medical practice; or
(B) Records concerning health insurance claims if maintained separately from the employer's medical program and its records, and not accessible to the employer by employee name or other direct personal identifier (e.g., social security number, payroll number, etc.); or
(C) Records created solely in preparation for litigation which are privileged from discovery under the applicable rules of procedure or evidence; or
(D) Records concerning voluntary employee assistance programs (alcohol, drug abuse, or personal counseling programs) if maintained separately from the employer's medical program and its records.

"Excursion factor" means the magnitude of the permissible excursion above the PEL-TWA for those substances not preceded by a "C" in Exhibit A and not found in Exhibit B.

"Exposure" or "exposed" means that an employee is subjected to a toxic material or harmful physical agent in the course of employment through any route of entry, such as inhalation, ingestion, skin contact, or absorption, and includes past exposure and potential exposure.

"Health professional" means a physician, occupational health nurse, industrial hygienist, toxicologist, or epidemiologist, providing

medical or other occupational health services to exposed employees.
"Permissible Exposure Limit (PEL)" means the airborne concentrations of substances to which it is believed that nearly all workers may be exposed with no adverse effect.
"Permissible Exposure Limit-Ceiling (PEL-C)" means the concentration that shall not be exceeded even instantaneously. The PEL-C is the employee's exposure, which shall not be exceeded during any part of the workday. 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.
"Permissible Exposure Limit-Short Term Exposure Level (PEL-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. 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.
"Permissible Exposure Limit-Time Weighted Average (PEL-TWA)" means the employee's average airborne exposure, which shall not be exceeded in any 7- to 8-hour work shift of a 40-hour workweek.
"Record" means any item, collection, or grouping of information regardless of the form or process by which it is maintained (e.g., paper document, microfiche, microfilm, X-ray film, or automated data processing).
"Specific chemical identity" means the chemical name, Chemical Abstracts Service (CAS) Registry Number, or any other information that reveals the precise chemical designation of the substance.
"Specific written consent" means a written authorization containing:

(1) The name and signature of the employee authorizing the release of medical information;
(2) The date of the written authorization;
(3) The name of the individual or organization that is authorized to release the medical information;
(4) The name of the designated representative (individual or organization) that is authorized to receive the released information;
(5) A general description of the medical information that is authorized to be released;
(6) A general description of the purpose for the release of the medical information; and
(7) A date or condition upon which the written authorization will expire (if less than one year); but A written authorization does not authorize the release of medical information not in existence on the date of written authorization, unless the release of future information is expressly authorized, and does not operate for more than one year from the date of written authorization. A written authorization may be revoked in writing prospectively at any time.

"Toxic material or harmful physical agent" means any chemical substance, biological agent (bacteria, virus, fungus, etc.), or physical stress (noise, heat, cold, vibration, repetitive motion, ionizing and non-ionizing radiation, hypo- or hyperbaric pressure, etc.) which:

(1) Is listed in the latest printed edition of the National Institute for Occupational Safety and Health (NIOSH) Registry of Toxic Effects of Chemical Substances (RTECS); or
(2) Has yielded positive evidence of an acute or chronic health hazard in testing conducted by, or known to, the employer; or

(3) Is the subject of a material safety-data sheet kept by or known to the employer indicating that the material may pose a hazard to human health.

"Trade secret" means any confidential formula, pattern, process, device, or information or compilation of information that is used in an employer's business and that gives the employer an opportunity to obtain an advantage over competitors who do not know or use it.

(c)State specific standards for Occupational Noise Exposure. The following standards are in effect in addition to those adopted by subsection (a). Where standards on a particular item exist in both subsection (a) and this subsection, the standards contained in this subsection supersede the standards in subsection (a).

(1) 29 CFR 1910.95 Table G-16 is amended to read as follows:

"TABLE G-16–PERMISSIBLE NOISE EXPOSURES[1]

Duration per day, hours	Sound level dBA slow response
8.....	90
6.....	92
4.....	95
3.....	97
2.....	100
1-1/2.....	102
1.....	105
1/2.....	110
1/4 or less.....	115

[1]When the daily noise exposure is composed of two or more periods of noise exposure of different levels, their combined effect shall be considered, rather than the individual effect of each. If the sum of the following fractions: C1/T1+C2/T2Cn/Tn exceeds unity, then, the mixed exposure shall be considered to exceed the limit value. Cn indicates the total time of exposure at a specific noise level, an Tn indicates the total time of exposure permitted at that level.

Exposure to impulsive or impact noise shall not exceed 140 dB peak sound pressure level."

(2) 29 CFR 1910.95(c)(1) is amended to read as follows:

(A) The employer shall administer a continuing, effective hearing conservation program, as described in paragraphs (c) through (o) of this section, whenever employee noise exposures equal or exceed an 8-hour time-weighted average sound level (TWA) of 85 decibels measured on the A scale (slow response) or a dose of 50 percent. For purposes of the hearing conservation program, employee noise exposures shall be computed in accordance with appendix (a) and table G-16a, and without regard to any attenuation provided by the use of personal protective equipment.

(d)State specific standards for Toxic and Hazardous Substances. The following standards are in effect in addition to those adopted by subsection (a). Where standards on a particular item exist in both subsection (a) and this subsection, the standards contained in this subsection supersede the standards in subsection (a).

(1) 29 CFR 1910.1000 is amended by adding the following:

(A) All employers shall measure, monitor, and record employee exposure to toxic materials or harmful physical agents. The

measurement shall determine if any employee may be exposed to concentrations of the toxic materials or harmful physical agents at or above the permissible exposure limit. The determination shall be made each time there is a change in production, process, or control measures which could result in an increase in concentrations of these materials or agents. A written record of the determination shall be made and shall contain at least:

(i) Any information, observations, or calculations that may indicate employee exposure to toxic or potentially toxic materials or harmful physical agents;

(ii) Any measurements taken;

(iii) Any employee complaints of symptoms that may be attributable to exposure to toxic or potentially toxic materials or harmful physical agents;

(iv) Date of determination, work being performed at the time, location within work site, name, and social security number of each employee considered; and

(v) Any other information that may be relevant to employee exposure.

(B) When medical examinations are appropriate for adequate employee protection, the employer shall, at the employer's cost, provide examinations to best determine the effect of toxic material or harmful physical agents on the health of employees.

(2) 29 CFR 1910.1000(a) is amended to read as follows:

(A) Air Contaminants Limits Column. An employee's exposure to any substance listed in Exhibit A shall not exceed the PEL-TWA, PEL-STEL and PEL-Ceiling specified for that substance shown in Exhibit A.

(i) Because many industrial exposures are not continuous, but instead are short-term, or intermittent, to which the PEL-TWAs cannot be applied, PEL-STELs for selected air contaminants are listed in Exhibit A.

(ii) The PEL-STELs listed in Exhibit A are 15-minute time-weighted average (TWA) exposures that shall not be exceeded at any time during a workday.

(iii) Exposures at the PEL-STEL shall not be longer than 15-minutes and shall not be repeated more than four times per day. There shall be at least 60 minutes between successive exposures at the PEL-STEL.

(B) Skin Designation. To prevent or reduce skin absorption, an employee's skin exposure to substances listed in Exhibit A with an "X" in the Skin Designation columns 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.

(3) 29 CFR 1910.1000(b) is amended to read as follows:

(A) Exhibit B.

(i) PEL-TWA. An employee's exposure to any material listed in Exhibit A, in any 7- to 8-hour work shift of a 40-hour workweek, shall not exceed the PEL-TWA given for that material in Exhibit B

(ii) Acceptable ceiling concentration. An employee's exposure to a material listed in Exhibit B shall not

exceed at any time during a 7- to 8-hour work shift the acceptable ceiling concentration given for that material in the table.

(4) The incorporation of Exhibit A at the end of section 12-60-50 entitled “Limits for Air Contaminants” dated July 1, 2011, is made a part of this chapter.

(5) The incorporation of Exhibit B at the end of section 12-60-50 entitled “More Limits for Air Contaminants” dated July 1, 2011, is made a part of this chapter. [Eff 2/13/12] (Auth: HRS §396-4) (Imp: HRS §396-4)

Historical note: §12-60-50 is based substantially upon Part 2. [Eff 6/8/82, am 7/24/94, am 9/30/94, am 8/10/95, am 1/16/96, am 2/8/97, am 10/23/97, am 7/6/98, am 3/29/99, am 7/6/99, am 2/14/00, am 12/29/00, am 12/29/01, am 5/21/04, am 5/5/05, am 9/1/05, am 3/31/06, am 12/21/06, am 4/19/07, am 8/29/07, am 5/2/08, am 7/27/09, R 2/13/12] and Part 8 [Eff 7/12/82, am 5/28/83, am 6/16/84, am 8/5/88, am 3/22/91, am 6/8/92, am 2/26/93, am 7/25/94, am 8/10/95, am 1/26/96, am 9/21/96, am 11/16/96, am 2/8/97, am 5/2/97, am 7/10/97, am 4/11/98, am 7/6/98, am 3/29/99, am 12/29/00, am 8/9/01, am 12/29/01, am 5/21/04, am 3/31/06, am 12/21/06, am 4/19/07, am 7/27/09, R 2/13/12]

Exhibit A (July 1, 2011)
Limits for Contaminants[1]

		Air Contaminant Limits**						
		PEL-TWA*		PEL-STEL[a]		PEL-CEILING		Skin Designation
Substance	CAS No.[b]	ppm[c]	mg/m3[d]	ppm[c]	mg/m3[d]	ppm[c]	mg/m3[d]	
Acetaldehyde	75-07-0	100	180	150	270	-	-	-
Acetic acid	64-19-7	10	25	15	37	-	-	-
Acetic anhydride	108-24-7	-	-	-	-	5	20	-
Acetone	67-64-1	750	1,780	1,000	2,375	-	-	-
Acetonitrile	75-05-8	40	70	60	105	-	-	X
2-Acetylaminofluorene	53-96-3	See §1910.1003						
Acetylene dichloride		See 1,2-Dichloroethylene						
Acetylene ttrabromide	79-27-6	1	14	1.5	20	-	-	-
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	2	6	-		-	-	X
Acrylonitrile	107-13-1	See §1910.1045						
Aldrin	309-00-2	-	0.25	-	0.75	-	-	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	-	-	X
Allyl propyl disulfide	2179-59-1	2	12	3	18	-	-	-
∀- Alumina	1344-28-1							
Total dust		-	10	-	20	-	-	-
Respirable fraction		-	5	-	-	-	-	-
Aluminum (as Al)	7429-90-5							
Metal & oxide								
Total dust		-	10	-	20	-	-	-
Respirable fraction		-	5	-	-	-	-	-
Pyro powders		-	5	-	-	-	-	-
Welding fumes		-	5	-	-	-	-	-
Soluble salts		-	2	-	-	-	-	-
Alkyls		-	2	-	-	-	-	-
4-Aminodiphenyl	92-67-1	See §1910.1003						
2-Aminoethanol		See Ethanolamine						
2-Aminopyridine	504-29-0	0.5	2	2	4	-	-	-
Amitrole	61-82-5	-	0.2	-	-	-	-	-
Ammonia	7664-41-7	25	18	35	27	-	-	-
Ammonium chloride Fume	12125-02-9	-	10	-	20	-	-	-
Ammonium sulfamate	7773-06-0							
Total dust		-	10	-	20	-	-	-
Respirable fraction		-	5	-	-	-	-	-
n-Amyl acetate	628-63-7	100	525	150	800	-	-	-
sec-Amyl acetate	626-38-0	125	650	150	800	-	-	-
Aniline and homologs	62-53-3	2	8	5	20	-	-	X

Limits for Air Contaminants[1] (Continued)

		Air Contaminant Limits**						
		PEL-TWA*		PEL-STEL[a]		PEL-CEILING		Skin Designation
Substance	CAS No.[b]	ppm[c]	mg/m3[d]	ppm[c]	mg/m3[d]	ppm[c]	mg/m3[d]	
Anisidine (o-, p-isomers)	29191-52-4	0.1	0.5	-	-	-	-	X
Antimony and compounds (as Sb)	7440-36-0	-	0.5	-	-	-	-	-
Antimony trioxide	1309-64-4							
Handling and use, as Sb		-	0.5	-	-	-	-	-
ANTU (Alpha Naphthyl-thiourea)	86-88-4	-	0.3	-	0.9	-	-	-
Arsenic, organic compounds (as As)	7440-38-2	-	0.2	-	-	-	-	-
Arsenic, inorganic compounds, (as As)	7440-38-2	See §1910.1018						
Arsine	7784-42-1	0.05	0.2	-	-	-	-	-
Asbestos	Varies	See §1910.1001 and 1926.1101						
Asphalt (petroleum) fumes	8052-42-4	-	5	-	10	-	-	-
Atrazine	1912-24-9	-	5	-	-	-	-	-
Azinphos-methyl	86-50-0	-	0.2	-	0.6	-	-	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		0.8	10	1.3	15	-	-	-
Respirable fraction		-	5	-	-	-	-	-
Benzene; see §1910.1028	71-43-2	See Exhibit B for operations excluded						
Benzidine	92-87-5	See §1910.1003						
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 (see Exhibit B)		0.025		-
Biphenyl		See Diphenyl						
Bismuth telluride, Undoped	1304-82-1							
Total dust		-	10	-	20	-	-	-
Respirable fraction		-	5	-	-	-	-	-
Bismuth telluride, Se-doped		-	5	-	10	-	-	-
Borates, tetra, sodium salts								

Limits for Air Contaminants[1] (Continued)

		Air Contaminant Limits**						
		PEL-TWA*		PEL-STEL[a]		PEL-CEILING		Skin Designation
Substance	CAS No.[b]	ppm[c]	mg/m3[d]	ppm[c]	mg/m3[d]	ppm[c]	mg/m3[d]	
Anhydrous	1330-43-4	-	1	-	-	-	-	-
Decahydrate	1303-96-4	-	5	-	-	-	-	-
Pentahydrate	12179-04-3	-	1	-	-	-	-	-
Boron oxide	1303-86-2							
total dust		-	10	-	20	-	-	-
Respirable fraction		-	-	-	-	-	-	-
Boron tribromide	10294-33-4	-	-	-	-	1	10	-
Boron trifluoride	7637-07-2	-	-	-	-	1	3	-
Bromacil	314-40-9	1	10	2	20	-	-	-
Bromine	7726-95-6	0.1	0.7	0.3	2	-	-	-
Bromine pentafluoride	7789-30-2	0.1	0.7	0.3	2	-	-	-
Bromoform	75-25-2	0.5	5	-	-	-	-	X
Butadiene (1,3-Butadiene)	106-99-0	See §1910.1051						
Butane	106-97-8	800	1,900	-	-	-	-	-
Butanethiol		See Butyl mercaptan						
2-Butanone (Methyl ethyl ketone)(MEK)	78-93-3	200	590	300	885	-	-	-
2-Butoxyethanol	111-76-2	25	120	75	360	-	-	X
n-Butyl-acetate	123-86-4	150	710	200	950	-	-	-
sec-Butyl acetate	105-46-4	200	950	250	1,190	-	-	-
tert-Butyl acetate	540-88-5	200	950	250	1,190	-	-	-
Butyl acrylate	141-32-2	10	55	-	-	-	-	-
n-Butyl alcohol	71-36-3	-	-	-	-	50	150	X
sec-Butyl alcohol	78-92-2	100	305	150	455	-	-	-
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	-	-	-	-	-	-	X
		See §1910.1026 and §1926.1126						
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	-	-	-
Cadmium fume (as Cd)	7440-43-9	-	-	-	-	-	0.05	-
Cadmium dust (as Cd)	7440-43-9	-	0.05	-	-	-	0.2	-
Calcium carbonate	1317-65-3							
Total dust		-	10	-	20	-	-	-
Respirable fraction		-	5	-	-	-	-	-
Calcium cyanamide	156-62-7	-	0.5	-	1	-	-	-
Calcium hydroxide	1305-62-0	-	5	-	-	-	-	-
Calcium oxide	1305-78-8	-	2	-	-	-	-	-
Calcium silicate	1344-95-2							
Total dust		-	10	-	-	-	-	-

Limits for Air Contaminants[1] (Continued)

Substance	CAS No.[b]	Air Contaminant Limits** PEL-TWA* ppm[c]	PEL-TWA* mg/m3[d]	PEL-STEL[a] ppm[c]	PEL-STEL[a] mg/m3[d]	PEL-CEILING ppm[c]	PEL-CEILING mg/m3[d]	Skin Designation
Respirable fraction		-	5	-	-	-	-	-
Calcium sulfate	7778-18-9							
Total dust		-	10	-	-	-	-	-
Respirable fraction		-	5	-	-	-	-	-
Camphor, synthetic	76-22-2	0.3	2	-	-	-	-	-
Caprolactam	105-60-2							
Dust		-	1	-	3	-	-	-
Vapor & Aerosol		5	20	-	40	-	-	-
Captafol (DifolatanR)	2425-06-1	-	0.1	-	-	-	-	-
Captan	133-06-2	-	5	-	15	-	-	-
Carbaryl (Sevin^R)	63-25-2	-	5	-	10	-	-	-
Carbofuran (Furadan^R)	1563-66-2	-	0.1	-	-	-	-	-
Carbon black	1333-86-4	-	3.5	-	7	-	-	-
Carbon dioxide	124-38-9	5,000	9,000	15,000	27,000	-	-	-
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	-	-	X
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		-	10	-	20	-	-	-
Respirable fraction		-	5	-	-	-	-	-
Cesium hydroxide	21351-79-1	-	2	-	-	-	-	-
Chlordane	57-74-9	-	0.5	-	2	-	-	X
Chlorinated camphene	8001-35-2	-	0.5	-	1	-	-	X
Chlorinated diphenyl Oxide	55720-99-5	-	0.5	-	2	-	-	-
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	-
Chloroacetone	78-95-5	-	-	-	-	1	4	X
α- 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	1,050	250	1,300	-	-	-
2-Chloro-1,3-Butadiene		see ß-Chloroprene						
Chlorodifluoromethane	75-45-6	1,000	3,500	1,250	4,375	-	-	-

Limits for Air Contaminants[1] (Continued)

Substance	CAS No.[b]	Air Contaminant Limits** PEL-TWA* ppm[c]	PEL-TWA* mg/m3[d]	PEL-STEL[a] ppm[c]	PEL-STEL[a] mg/m3[d]	PEL-CEILING ppm[c]	PEL-CEILING mg/m3[d]	Skin Designation
Chlorodiphenyl (42% chlorine) (PCB)	53469-21-9	-	1	-	2	-	-	X
Chlorodiphenyl (54% Chlorine) (PCB)	11097-69-1	-	0.5	-	1	-	-	X
1-Chloro, 2,3-epoxypropane		See Epichlorohydrin						
2-Chloroethanol		See Ethylene chlorohydrin						
Chloroethylene		See Vinyl chloride						
Chloroform (Trichloromethane)	67-66-3	2	9.78	-	-	-	-	-
bis(Chloromethyl) ether	542-88-1	see §1910.1003						
Chloromethyl methyl ether	107-30-2	see §1910.1003						
1-Chloro-1-nitropropane	600-25-9	2	10	-	-	-	-	-
Chloropentafluoroethane	76-15-3	1,000	6,320	-	-	-	-	-
Chloropicrin	76-06-2	0.1	0.7	0.3	2	-	-	-
ß-Chloroprene	126-99-8	10	35	-	-	-	-	X
o-Chlorostyrene	2039-87-4	50	285	75	428	-	-	-
o-Chlorotoluene	95-49-8	50	250	75	375	-	-	X
2-Chloro-6-(trichloro-methyl) pyridine	1929-82-4							
Total dust		-	10	-	20	-	-	-
Respirable fraction		-	5	-	-	-	-	-
Chlorpyrifos	2921-88-2	-	0.2	-	0.6	-	-	X
Chromic acid and chromates (as CrO_3)	Varies with compound	-	-	-	-	-	0.1	-
Chromite ore processing (Chromate), (as Cr)		-	0.05	-	-	-	-	-
Chromium (II)	7440-47-3	-	0.5	-	-	-	-	-
Chromium (III) compounds (as Cr)	7440-47-3	-	0.5	-	-	-	-	-
Chromium (VI) Water soluble & insoluble		See §1910.1026 and §1926.1126					-	-
Chromium metal (as Cr)	7440-47-3	-	0.5	-	-	-	-	-
Chromyl chloride	14977-61-8	0.025	0.15	-	-	-	-	-
Chrysene		See Coal tar pitch volatiles						
Clopidol	2971-90-6							
Total dust		-	10	-	20	-	-	-
Respirable fraction		-	5	-	-	-	-	-

Limits for Air Contaminants[1] (Continued)

Substance	CAS No.[b]	Air Contaminant Limits** PEL-TWA* ppm[c]	PEL-TWA* mg/m3[d]	PEL-STEL[a] ppm[c]	PEL-STEL[a] mg/m3[d]	PEL-CEILING ppm[c]	PEL-CEILING mg/m3[d]	Skin Designation
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	-	0.2f	-	-	-	-	-
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								
Copper	7440-50-8							
Fume (as Cu)		-	0.1	-	-	-	-	-
Dusts and mists (as Cu)		-	1	-	2	-	-	-
Cotton dust (raw)		See §1910.1043						
Crag herbicide (Sesone) (Sodium 2,4-dichloro-phenoxyethyl sulfate)	136-78-7							
Total dust		-	10	-	20	-	-	-
Respirable fraction		-	5	-	-	-	-	-
Cresol, all isomers	1319-77-3	5	22	-	-	-	-	X
Crotonaldehyde	123-73-9 4170-30-3	2	6	6	18	-	-	-
Crufomate	299-86-5	-	5	-	20	-	-	-
Cumene	98-82-8	50	245	75	365	-	-	X
Cyanamide	420-04-2	-	2	-	-	-	-	-
Cyanides (as CN)	Varies with compound	-	5	-	-	-	-	X
Cyanogen	460-19-5	10	20	-	-	-	-	-
Cyanogen chloride	506-77-4	-	-	-	-	0.3	0.6	-
Cyclohexane	110-82-7	300	1,050	375	1,300	-	-	-
Cyclohexanol	108-93-0	50	200	-	-	-	-	X
Cyclohexanone	108-94-1	25	100	100	400	-	-	X
Cyclohexene	110-83-8	300	1,015	-	-	-	-	-

Limits for Air Contaminants[1] (Continued)

		Air Contaminant Limits**						
		PEL-TWA*		PEL-STEL[a]		PEL-CEILING		Skin Designation
Substance	CAS No.[b]	ppm[c]	mg/m3[d]	ppm[c]	mg/m3[d]	ppm[c]	mg/m3[d]	
Cyclohexylamine	108-91-8	10	40	-	-	-	-	-
Cyclonite	121-82-4		1.5	-	3	-	-	X
Cyclopentadiene	542-92-7	75	200	75	200	-	-	-
Cyclopentane	287-92-3	600	1,720	900	2,580	-	-	-
Cyhexatin	13121-70-5	-	5	-	10	-	-	-
2,4-D (Dichloryl-phenoxyacetic acid)	94-75-7	-	10	-	20	-	-	-
DDT (Dichlorodiphenyl-trichloroethane)	50-29-3	-	1	-	3	-	-	X
Decaborane	17702-41-9	0.05	0.3	0.15	0.9	-	-	X
Demeton (Systox[R])	8065-48-3	-	0.1	0.03	0.3	-	-	X
Diacetone alcohol (4-hydroxy-4-methyl-2-pentanone)	123-42-2	50	240	75	360	-	-	-
1,2-Diaminoethane		See Ethylenediamine						
Diazinon	333-41-5	-	0.1	-	0.3	-	-	X
Diazomethane	334-88-3	0.2	0.4	-	-	-	-	-
Diborane	19287-45-7	0.1	0.1	-	-	-	-	-
1,2-Dibromo-3-chloropropane	96-12-8	See §1910.1044						
2-N-Dibutylamino-ethanol	102-81-8	2	14	4	28	-	-	X
Dibutyl phosphate	107-66-4	1	5	2	10	-	-	-
Dibutyl phthalate	84-74-2	-	5	-	10	-	-	-
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	91-94-1	See §1910.1003						
Dichlorodifluoromethane	75-71-8	1,000	4,950	1,250	6,200	-	-	-
1,3-Dichloro-5,5-dimethyl hydantoin	118-52-5	-	0.2	-	0.4	-	-	-
1,1-Dichloroethane	75-34-3	100	400	250	1,010	-	-	-
1,2-Dichloroethylene	540-59-0	200	790	250	1,000	-	-	-
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-nitro-ethane	594-72-9	2	10	10	60	-	-	-
1,2-Dichloropropane		See Propylene dichloride						
1,3-Dichloropropene	542-75-6	1	5	-	-	-	-	X
2,2-Dichloropropionic acid	75-99-0	1	6	-	-	-	-	-

Limits for Air Contaminants[1] (Continued)

Substance	CAS No.[b]	Air Contaminant Limits** PEL-TWA* ppm[c]	PEL-TWA* mg/m3[d]	PEL-STEL[a] ppm[c]	PEL-STEL[a] mg/m3[d]	PEL-CEILING ppm[c]	PEL-CEILING mg/m3[d]	Skin Designation
Dichlorotetrafluoro-ethane	76-14-2	1,000	7,000	1,250	8,750	-	-	-
Dichlorvos (DDVP)	62-73-7	0.1	1	0.3	3	-	-	X
Dicrotophos	141-66-2	-	0.25	-	-	-	-	X
Dicyclopentadiene	77-73-6	5	30	-	-	-	-	-
Dicyclopentadienyl iron	102-54-5							
Total dust		-	10	-	20	-	-	-
Respirable fraction		-	5	-	-	-	-	-
Dieldrin	60-57-1	-	0.25	-	0.75	-	-	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	-	10	-	-	-
Difluorodibromomethane	75-61-6	100	860	150	1,290	-	-	-
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	60-11-7	See §1910.1003						
Dimethoxymethane	109-87-5							
Dimethyl acetamide	127-19-5	10	35	15	50	-	-	X
Dimethylamine	124-40-3	10	18	10	50	-	-	-
Dimethylaminobenzene		See Xylidine						
Dimethylaniline (N-Dimethyl-aniline	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	20	60	-	-	X
2,6-Dimethyl-4-heptanone		See Diisobutyl ketone						
1,1-Dimethylhydrazine	57-14-7	0.5	1	1	2	-	-	X
Dimethylphthalate	131-11-3	-	5	-	10	-	-	-
Dimethyl sulfate	77-78-1	0.1	0.5	-	-	-	-	X
Dinitolmide (3,5-Dinitro-o-toluamide)	148-01-6	-	5	-	10	-	-	-

Limits for Air Contaminants[1] (Continued)

Substance	CAS No.[b]	Air Contaminant Limits** PEL-TWA* ppm[c]	PEL-TWA* mg/m3[d]	PEL-STEL[a] ppm[c]	PEL-STEL[a] mg/m3[d]	PEL-CEILING ppm[c]	PEL-CEILING mg/m3[d]	Skin Designation
Dinitrobenzene (all isomers) (alpha-)	528-29-0	0.15	1	0.5	1	-	-	X
(meta-)	99-65-0							
(para-)	100-25-4							
Dinitro-o-cresol	534-52-1	-	0.2	-	0.6	-	-	X
Dinitrotoluene	25321-14-6	-	1.5	-	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	1.5	0.6	4	-	-	-
Diphenylamine	122-39-4	-	10	-	20	-	-	-
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	85-00-7	-	0.5	-	1	-	-	-
Di-sec-octyl phthalate (Di-2-ethylhexyl-phthalate)	117-81-7	-	5	-	10	-	-	-
Disulfiram	97-77-8	-	2	-	5	-	-	-
Disulfoton	298-04-4	-	0.1	-	0.3	-	-	X
2,6-Di-tert-butyl-p-cresol	128-37-0	-	10	-	20	-	-	-
Diuron	330-54-1	-	10	-	-	-	-	-
Divinyl benzene	1321-74-0	10	50	-	-	-	-	-
Emery	112-62-9							
Total dust		-	10	-	-	-	-	-
Respirable fraction		-	5	-	-	-	-	-
Endosulfan	115-29-7	-	0.1	-	0.3	-	-	X
Endrin	72-20-8	-	0.1	-	0.3	-	-	X
Epichlorohydrin	106-89-8	2	8	-	-	-	-	X
EPN	2104-64-5	-	0.5	-	2	-	-	X
1,2-Epoxypropane		See Propylene oxide						
2,3-Epoxy-1-propanol		See Glycidol						
Ethanethiol		See Ethyl mercaptan						
Ethanolamine	141-43-5	3	8	6	15	-	-	-
Ethion	563-12-2	-	0.4	-	-	-	-	X
2-Ethoxyethanol	110-80-5	5	19	-	-	-	-	X
2-Ethoxyethyl acetate (Cellosolve acetate)	111-15-9	5	27	-	-	-	-	X
Ethyl acetate	141-78-6	400	1,400	-	-	-	-	-
Ethyl acrylate	140-88-5	5	20	25	100	-	-	X
Ethyl alcohol (Ethanol)	64-17-5	1,000	1,900	-	-	-	-	-

Limits for Air Contaminants[1] (Continued)

Substance	CAS No.[b]	Air Contaminant Limits** PEL-TWA* ppm[c]	PEL-TWA* mg/m3[d]	PEL-STEL[a] ppm[c]	PEL-STEL[a] mg/m3[d]	PEL-CEILING ppm[c]	PEL-CEILING mg/m3[d]	Skin Designation
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	1,110	-	-	-
Ethyl butyl ketone (3-Heptanone)	106-35-4	50	230	75	345	-	-	-
Ethyl chloride	75-00-3	1,000	2,600	1,250	3,250	-	-	-
Ethyl ether	60-29-7	400	1,200	500	1,500	-	-	-
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		X
		See Exhibit B for operations excluded						
Ethylene dichloride	107-06-2	1	4	2	8	-	-	-
Ethylene glycol, vapor	107-21-1	-	-	-	-	50	125	-
Ethylene glycol dinitrate (EGDN)[l]	628-96-6	0.05	0.3	-	0.1	-	-	X
Ethylene glycol methyl acetate		See Methyl cellosolve acetate						
Ethylene imine	151-56-4	See §1910.1003						
Ethylene oxide	75-21-8	See §1910.1047						
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	-	20	-	-	-
Respirable fraction	-	-	-	-	-	-	-	
Ferrovanadium dust	12604-58-9	-	1	-	3	-	-	-
Fibrous glass dust	-	-	10[h]	-	-	-	-	-
Fluorides (as F)	Varies with compound	-	2.5	-	-	-	-	-
Fluorine	7782-41-4	0.1	0.2	-	-	-	-	-
Fluorotrichloromethane (Trichlorofluoromethane)	75-69-4	-	-	-	-	1,000	5,600	-
Fonofos	944-22-9	-	0.1	-	-	-	-	X
Formaldehyde	50-00-0	See §1910.1048						

Limits for Air Contaminants[1] (Continued)

Substance	CAS No.[b]	Air Contaminant Limits** PEL-TWA* ppm[c]	PEL-TWA* mg/m3[d]	PEL-STEL[a] ppm[c]	PEL-STEL[a] mg/m3[d]	PEL-CEILING ppm[c]	PEL-CEILING mg/m3[d]	Skin Designation
Formamide	75-12-7	10	15	-	-	-	-	-
Formic acid	64-18-6	5	9	10	18	-	-	-
Furfural	98-01-1	2	8	-	-	-	-	X
Furfuryl alcohol	98-00-0	10	40	15	60	-	-	X
Gasoline	8006-61-9	300	900	-	-	-	-	-
Germanium tetrahydride	7782-65-2	0.2	0.6	0.6	1.8	-	-	-
Glutaraldehyde	111-30-8	-	-	-	-	0.2	0.7	-
Glycerin (mist)	56-81-5							
Total dust		-	10	-	-	-	-	-
Respirable fraction	-	5	-	-	-	-	-	
Glycidol	556-52-5	25	75	-	-	-	-	-
Glycol monoethyl ether		See 2-Ethoxyethanol						
Grain dust (oat, wheat, barley)	-	-	10	-	-	-	-	-
Graphite, natural respirable dust	7782-42-5	-	2.5	-	-	-	-	-
Graphite, synthetic	-							
Total dust		-	10	-	-	-	-	-
Respirable fraction		-	5	-	-	-	-	-
GuthionR		See Azinphos methyl						
Gypsum	13397-24-5							
Total dust		-	10	-	20	-	-	-
Respirable fraction	-	5	-	-	-	-	-	
Hafnium	7440-58-6		-	0.5	-	1.5	-	-
Heptachlor	76-44-8	-	0.5	-	2	-	-	X
Heptane (n-Heptane)	142-82-5	400	1,600	500	2,000	-	-	-
Hexachlorobutadiene	87-68-3	0.02	0.24	-	-	-	-	-
Hexachlorocyclo-pentadiene	77-47-4	0.01	0.1	0.03	0.3	-	-	-
Hexachloroethane	67-72-1	1	10	-	-	-	-	X
Hexachloronaphthalene	1335-87-1	-	0.2	-	0.6	-	-	X
Hexafluoroacetone	684-16-2	0.1	0.7	0.3	2	-	-	X
n-Hexane	110-54-3	50	180	-	-	-	-	-
Hexane isomers	Varies with compound	500	1,800	-	-	-	-	-
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	-

Limits for Air Contaminants[1] (Continued)

Substance	CAS No.[b]	Air Contaminant Limits** PEL-TWA* ppm[c]	PEL-TWA* mg/m3[d]	PEL-STEL[a] ppm[c]	PEL-STEL[a] mg/m3[d]	PEL-CEILING ppm[c]	PEL-CEILING mg/m3[d]	Skin Designation
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	2	3	-	-	-
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	-	4	-	-	-
2-Hydroxypropyl acrylate	999-61-1	0.5	3	-	-	-	-	X
Indene	95-13-6	10	45	15	70	-	-	-
Indium and compounds (as In)	7440-74-6	-	0.1	-	0.3	-	-	-
Iodine	7553-56-2	-	-	-	-	0.1	1	-
Iodoform	75-47-8	0.6	10	1	20	-	-	-
Iron oxide dust and fume (as Fe)	1309-37-1							
Total particulate		-	5	-	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	-	2	-	-	-
Isoamyl acetate	123-92-2	100	525	125	655	-	-	-
Isoamyl alcohol (primary and secondary)	123-51-3	100	360	125	450	-	-	-
Isobutyl acetate	110-19-0	150	700	187	888	-	-	-
Isobutyl alcohol	78-83-1	50	150	75	225	-	-	-
Isooctyl alcohol	26952-21-6	50	270	-	-	-	-	X
Isophorone	78-59-1	4	23	-	-	5	28	-
Isophorone diiso-cyanate	4098-71-9	0.005	0.045	0.02	-	-	-	X
2-Isopropoxyethanol	109-59-1	25	105	75	320	-	-	-
Isopropyl acetate	108-21-4	250	950	310	1,185	-	-	-
Isopropyl alcohol	67-63-0	400	980	500	1,225	-	-	-
Isopropylamine	75-31-0	5	12	10	24	-	-	-
N-Isopropylaniline	768-52-5	2	10	-	-	-	-	X
Isopropyl ether	108-20-3	250	1,050	310	1,320	-	-	-
Isopropyl glycidyl ether (IGE)	4016-14-2	50	240	75	360	-	-	-
Kaolin	-							
Total dust		-	10	-	20	-	-	-
Respirable fraction		-	5	-	-	-	-	-

Limits for Air Contaminants[1] (Continued)

Substance	CAS No.[b]	Air Contaminant Limits** PEL-TWA* ppm[c]	PEL-TWA* mg/m3[d]	PEL-STEL[a] ppm[c]	PEL-STEL[a] mg/m3[d]	PEL-CEILING ppm[c]	PEL-CEILING mg/m3[d]	Skin Designation
Ketene	463-51-4	0.5	0.9	1.5	3	-	-	-
Lead chromate, as Cr	7758-97-6	-	0.05	-	-	-	-	-
Lead inorganic (as Pb)	7439-92-1	See §1910.1025 and 1926.62						
Limestone	1317-65-3							
Total dust		-	10	-	20	-	-	-
Respirable fraction		-	5	-	-	-	-	-
Lindane	58-89-9	-	0.5	-	1.5	-	-	X
Lithium hydride	7580-67-8	-	0.025	-	-	-	-	-
L.P.G. (Liquefied petroleum gas)	68476-85-7	1,000	1,800	1,250	2,250	-	-	-
Magnesite	546-93-0							
Total dust		-	10	-	20	-	-	-
Respirable fraction		-	5	-	-	-	-	-
Magnesium oxide fume	1309-48-4							
Total particulate		-	10	-	-	-	-	-
Malathion	121-75-5							
Total dust		-	10	-	-	-	-	X
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	-	0.3	-	-	X
Manganese tetroxide (as Mn)	1317-35-7	-	1	-	-	-	-	-
Marble (Calcium carbonate)	1317-65-3							
Total dust		-	10	-	20	-	-	-
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	-	-	-	-	-

Limits for Air Contaminants[1] (Continued)

Substance	CAS No.[b]	Air Contaminant Limits** PEL-TWA* ppm[c]	PEL-TWA* mg/m3[d]	PEL-STEL[a] ppm[c]	PEL-STEL[a] mg/m3[d]	PEL-CEILING ppm[c]	PEL-CEILING mg/m3[d]	Skin Designation
2-Methoxyethanol	150-76-5	See Methyl cellosolve						
4-Methoxyphenol								
Methyl acetate	79-20-9	200	610	250	760	-	-	-
Methyl acetylene (Propyne)	74-99-7	1,000	1,650	1,250	2,040	-	-	-
Methyl acetylene-propadiene mixture (MAPP)	-	1,000	1,800	1,250	2,250	-	-	-
Methyl acrylate	96-33-3	10	35	-	-	-	-	X
Methylacrylonitrile	126-98-7	1	3	2	6	-	-	X
Methylal (Dimethoxy-methane)	109-87-5	1,000	3,100	1,250	3,875	-	-	-
Methyl alcohol (methanol)	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	50	235	-	-	-	-	-
N-Methyl aniline	100-61-8	0.5	2	1	5	-	-	X
Methyl bromide	74-83-9	5	20	15	60	-	-	X
Methyl n-butyl ketone		See 2-Hexanone						
Methyl cellosolve (2-Methoxyethanol)	109-86-4	5	16	-	-	-	-	X
Methyl cellosolve acetate (2-Methoxyethyl acetate)	110-49-6	5	24	-	-	-	-	X
Methyl chloride	74-87-3	50	105	106	205	200	-	-
Methyl chloroform (1,1,1-Trichloro-ethane)	71-55-6	350	1,900	450	2,450	-	-	-
Methyl 2-cyanoacrylate	137-05-3	2	8	4	16	-	-	-
Methylcyclohexane	108-87-2	400	1,600	500	2,000	-	-	-
Methylcyclohexanol	25639-42-3	50	235	75	350	-	-	-
o-Methylcyclohexanone	538-60-8	50	230	75	345	-	-	X
2-Methylcyclo-pentadienyl manganese tricarbonyl (as Mn)	12108-13-3	-	0.2	-	0.6	-	-	X
Methyl demeton	8022-00-2	-	0.5	-	1.5	-	-	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	-

Limits for Air Contaminants[1] (Continued)

Substance	CAS No.[b]	Air Contaminant Limits** PEL-TWA* ppm[c]	PEL-TWA* mg/m3[d]	PEL-STEL[a] ppm[c]	PEL-STEL[a] mg/m3[d]	PEL-CEILING ppm[c]	PEL-CEILING mg/m3[d]	Skin Designation
Methylene chloride	75-09-2	See §1910.1052						
4,4'-Methylene dianiline;	101-77-9	See §1910.1050 and 1926.60						
Methyl ethyl ketone (MEK)		See 2-Butanone						
Methyl ethyl ketone peroxide (MEKP)	1338-23-4	-	-	-	-	0.2	1.5	-
Methyl formate	107-31-3	100	250	150	375	-	-	-
Methyl hydrazine (Mono-methyl 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	-	-	-	-	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	-	0.6	-	-	X
Methyl propyl ketone		See 2-Pentanone						
Methyl silicate	681-84-5	1	6	-	-	-	-	-
α- Methyl styrene	98-83-9	50	240	100	485	-	-	-
Methylal	109-87-5							
Methylene bisphenyl isocyanate (MDI)	101-68-8	-	-	-	-	0.02	0.2	-
Metribuzin	21087-64-9	-	5	-	-	-	-	-
Mevinphos[R]		See Phosdrin						
Mica		See Silicates						
Molybdenum (as Mo)	7439-98-7							
Soluble compounds		-	5	-	10	-	-	-
Insoluble compounds Total dust		-	10	-	20	-	-	-
Monocrotophos (Azodrin[R])	6923-22-4	-	0.25	-	-	-	-	-
Monomethyl aniline (N-Methylaniline)	100-61-8	0.5	2	-	-	-	-	X
Morpholine	110-91-8	20	70	30	105	-	-	X
Naled	300-76-5		-	3	-	6	-	X
Naphtha (Coal tar)	8030-30-6	100	400	-	-	-	-	-
Naphthalene	91-20-3	10	50	15	75	-	-	-
α- Naphthylamine	134-32-7	See §1910.1003						

Limits for Air Contaminants[1] (Continued)

Substance	CAS No.[b]	Air Contaminant Limits** PEL-TWA* ppm[c]	PEL-TWA* mg/m3[d]	PEL-STEL[a] ppm[c]	PEL-STEL[a] mg/m3[d]	PEL-CEILING ppm[c]	PEL-CEILING mg/m3[d]	Skin Designation
ß-naphthylamine	91-59-8	See §1910.1003						
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	-	0.3	-	-	-
Nickel sulfide roasting, fume & dust, (as Ni)	-	-	1	-	-	-	-	-
Nicotine	54-11-5	-	0.5	-	1.5	-	-	X
Nitrapyrin	1929-82-4	-	10	-	20	-	-	-
Nitric acid	7697-37-2	2	5	4	10	-	-	-
Nitric oxide	10102-43-9	25	30	35	45	-	-	-
p-Nitroaniline	100-01-6	-	3	-	-	-	-	X
Nitrobenzene	98-95-3	1	5	2	10	-	-	X
p-Nitrochlorobenzene	100-00-5	0.1	0.6	-	-	-	-	X
4-Nitrodiphenyl	92-93-3	See §1910.1003						
Nitroethane	79-24-3	100	310	150	465	-	-	-
Nitrogen dioxide	10102-44-0	3	6	5	9.4	-	-	-
Nitrogen trifluoride	7783-54-2	10	29	15	45	-	-	-
Nitroglycerin (NG)[l]	55-63-0	-	-	-	0.1	-	-	X
Nitromethane	75-52-5	100	250	150	375	-	-	-
1-Nitropropane	108-03-2	25	90	35	135	-	-	-
2-Nitropropane	79-46-9	10	35	-	-	-	-	-
N-Nitrosodi-methylamine	62-75-9	See §1910.1003						
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						
Nitrous oxide	10024-97-2	50	91	-	-	-	-	-
Nonane	111-84-2	200	1,050	250	1,300	-	-	-
Octachloronaphthalene	2234-13-1	-	0.1	-	0.3	-	-	X
Octane	111-65-9	300	1,450	375	1,800	-	-	-
Oil mist, mineral	8012-95-1-	5[i]	-	10[i]	-	-	-	-
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	0.11	-
Ozone	10028-15-6	0.1	0.2	0.3	0.6	-	-	-
Paraffin wax fume	8002-74-2	-	2	-	6	-	-	-

Limits for Air Contaminants[1] (Continued)

		Air Contaminant Limits**						
		PEL-TWA*		PEL-STEL[a]		PEL-CEILING		Skin Designation
Substance	CAS No.[b]	ppm[c]	mg/m3[d]	ppm[c]	mg/m3[d]	ppm[c]	mg/m3[d]	
Paraquat, respirable dust	1910-42-5	-	0.1	-	-	-	-	X
	2074-50-2	-	0.1	-	-	-	-	X
	4685-14-7	-	0.1	-	-	-	-	X
Parathion	56-38-2	-	0.1	-	0.3	-	-	X
Particulates not other wise regulated	-							
Total dust	-	-	10	-	-	-	-	-
Respirable fraction	-	-	5	-	-	-	-	-
Pentaborane	19624-22-7	0.005	0.01	0.015	0.03	-	-	-
Pentachloronaphthalene	1321-64-8	-	0.5	-	2	-	-	X
Pentachlorophenol	87-86-5	-	0.5	-	1.5	-	-	X
Pentaerythritol	115-77-5							
Total dust		-	10	-	20	-	-	-
Respirable fraction			5	-	-	-	-	-
Pentane	109-66-0	600	1,800	750	2,250	-	-	-
2-Pentanone (Methyl propyl ketone)	107-87-9	200	700	250	875	-	-	-
Perchloroethylene (Tetrachloro-ethylene)	127-18-4	25	170	200	1,340	-	-	-
Perchloromethyl mercaptan	594-42-3	0.1	0.8	-	-	-	-	-
Perchloryl fluoride	7616-94-6	3	14	6	28	-	-	-
Perlite	-							
Total dust		-	10	-	-	-	-	-
Respirable fraction			5	-	-	-	-	-
Petroleum distillates (Naphtha)	8002-05-9	400	1,600	-	-	-	-	-
Phenol	108-95-2	5	19	10	38	-	-	X
Phenothiazine	92-84-2	-	5	-	10	-	-	X
p-Phenylene diamine	106-50-3	-	0.1	-	-	-	-	X
Phenyl ether, vapor	101-84-8	1	7	2	14	-	-	-
Phenyl ether-biphenyl mixture, vapor	-	1	7	-	-	-	-	-
Phenylethylene		See Styrene						
Phenyl glycidyl ether (PGE)	122-60-1	1	6	-	-	-	-	-
Phenylhydrazine	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[R])	7786-34-7	0.01	0.1	0.03	0.3	-	-	X

Limits for Air Contaminants[1] (Continued)

		Air Contaminant Limits**						
		PEL-TWA*		PEL-STEL[a]		PEL-CEILING		Skin Designation
Substance	CAS No.[b]	ppm[c]	mg/m3[d]	ppm[c]	mg/m3[d]	ppm[c]	mg/m3[d]	
Phosgene (Carbonyl chloride)	75-44-5	0.1	0.4	-	-	-	-	-
Phosphine	7803-51-2	0.3	0.4	1	1.4	-	-	-
Phosphoric acid	7664-38-2	-	1	-	3	-	-	-
Phosphorus (yellow)	7723-14-0	-	0.1	-	0.3	-	-	-
Phosphorus oxychloride	10025-87-3	0.1	0.6	0.5	3	-	-	-
Phosphorus penta-Chloride	10026-13-8	-	1	-	3	-	-	-
Phosphorus penta-Sulfide	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	-	-	-	-	-
Picloram	1918-02-1							
Total dust		-	10	-	20	-	-	-
Respirable fraction			5	-	-	-	-	-
Picric acid	88-89-1	-	0.1	-	0.3	-	-	X
Pindone (2-Pivalyl-1,3-indandione)	83-26-1	-	0.1	-	0.3	-	-	-
Piperazine dihydro-chloride	142-64-3	-	5	-	-	-	-	-
Plaster of Paris	26499-65-0							
Total dust		-	10	-	-	-	-	-
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	1,000	1,800	-	-	-	-	-
Propargyl alcohol	107-19-7	1	2	3	6	-	-	X
ß-Propiolactone	57-57-8	See §1910.1003						
Propionic acid	79-09-4	10	30	15	45	-	-	-
Propoxur (Baygon)	114-26-1	-	0.5	-	2	-	-	-
n-Propyl acetate	109-60-4	200	840	250	1,050	-	-	-
n-Propyl alcohol	71-23-8	200	500	250	625	-	-	X
n-Propyl Nitrate	627-13-4	25	105	40	170	-	-	-
Propylene dichloride	78-87-5	75	350	110	510	-	-	-
Propylene glycol dinitrate (PGDN)	6423-43-4	0.05	0.3	0.1	0.6	-	-	X
Propylene glycol mono-methyl ether	107-98-2	100	360	150	540	-	-	-
Propylene imine	75-55-8	2	5	-	-	-	-	X

Limits for Air Contaminants[1] (Continued)

Substance	CAS No.[b]	Air Contaminant Limits** PEL-TWA* ppm[c]	PEL-TWA* mg/m3[d]	PEL-STEL[a] ppm[c]	PEL-STEL[a] mg/m3[d]	PEL-CEILING ppm[c]	PEL-CEILING mg/m3[d]	Skin Designation
Propylene oxide	75-56-9	20	50	-	-	-	-	-
n-Propyl nitrate	627-13-4	25	105	40	170	-	-	-
Propyne		See Methyl acetylene						
Pyrethrum	8003-34-7	-	5	-	10	-	-	-
Pyridine	110-86-1	5	15	10	30	-	-	-
Quinone	106-51-4	0.1	0.4	0.3	1	-	-	-
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	-	0.3	-	-	-
Rotenone (commercial)	83-79-4	-	5	-	10	-	-	-
Rouge	-							
Total dust		-	10	-	20	-	-	-
Respirable fraction		-	5	-	-	-	-	-
Rubber solvent (Naphtha)	-	400	1,600	-	-	-	-	-
Selenium compounds (as Se)	- 7782-49-2	0.2		-	-	-	-	-
Selenium hexafluoride (as Se)	7783-79-1	0.05	0.2	-	-	-	-	-
Sesone (Sodium 2,4-dichloro-phenoxy-ethyl sulfate)		See Crag herbicide						
Silane		See Silicone tetrahydride						
Silica, amorphous, precipitated and gel	-	-	6	-	-	-	-	-
Silica, amorphous, diatomaceous earth containing less than 1% crystalline silica	- 61790-53-2	6	-	-	-	-	-	
Silica, crystalline cristobalite (as quartz), respirable dust	14464-46-1	-	0.05	-	-	-	-	-
Silica, crystalline quartz (as quartz), respirable dust	14808-60-7	-	0.1	-	-	-	-	-

Limits for Air Contaminants[1] (Continued)

Substance	CAS No.[b]	Air Contaminant Limits** PEL-TWA* ppm[c]	PEL-TWA* mg/m3[d]	PEL-STEL[a] ppm[c]	PEL-STEL[a] mg/m3[d]	PEL-CEILING ppm[c]	PEL-CEILING mg/m3[d]	Skin Designation
Silica, crystalline tripoli (as quartz), respirable dust	1317-95-9	-	0.1	-	-	-	-	-
Silica, crystalline tridymite (as quartz), 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	-	-	-	-	-
Soapstone, respirable dust	-	-	3	-	-	-	-	-
Talc (containing asbestos): use asbestos limit	-	See §1910.1003						
Talc (containing no asbestos), respirable dust	14807-96-6	-	2	-	-	-	-	-
Tremolite		See §1910.1003						
Silicon	7440-21-3							
Total dust		-	10	-	20	-	-	-
Respirable fraction		-	5	-	-	-	-	-
Silicon carbide	409-21-2							
Total dust		-	10	-	20	-	-	-
Respirable fraction		-	5	-	-	-	-	-
Silicon tetrahydride (Silane)	7803-62-5	5	7	-	-	-	-	-
Silver, metal and soluble compounds (as Ag)	7440-22-4	-	0.01	-	-	-	-	-
Soapstone		See Silicates						
Sodium azide	26628-22-8							
(as HN_3)		-	-	-	-	0.1	-	X
(as NaN_3)		-	-	-	-	-	0.3	X
Sodium bisulfite	7631-90-5	-	5	-	-	-	-	-
Sodium 2,4-dichloro-phenoxyethyl sulfate		See Crag herbicide (see Sesone)						
Sodium fluoroacetate	62-74-8	-	0.05	-	0.15	-	-	X

Limits for Air Contaminants[1] (Continued)

Substance	CAS No.[b]	Air Contaminant Limits** PEL-TWA* ppm[c]	PEL-TWA* mg/m3[d]	PEL-STEL[a] ppm[c]	PEL-STEL[a] mg/m3[d]	PEL-CEILING ppm[c]	PEL-CEILING mg/m3[d]	Skin Designation
Sodium hydroxide	1310-73-2	-	-	-	-	-	2	-
Sodium metabisulfite	7681-57-4	-	5	-	-	-	-	-
Starch	9005-25-8							
Total dust		-	10	-	20	-	-	-
Respirable fraction		-	5	-	-	-	-	-
Stibine	7803-52-3	0.1	0.5	0.3	1.5	-	-	-
Stoddard solvent	8052-41-3	100	525	-	-	-	-	-
Strychnine	57-24-9	-	0.15	-	0.45	-	-	-
Styrene, monomer	100-42-5	50	215	100	425	-	-	-
Subtilisins (Proteolytic enzymes)	9014-01-1	-	-	-	0.00006 (60 min)[j]		-	-
Sucrose	57-50-1							
Total dust		-	10	-	20	-	-	-
Respirable fraction		-	5	-	-	-	-	-
Sulfotep;		See TEDP						
Sulfur dioxide	7446-09-5	2	5	5	10	-	-	-
Sulfur hexafluoride	2551-62-4	1,000	6,000	1,250	7,500	-	-	-
Sulfuric acid	7664-93-9	-	1	-	3	-	-	-
Sulfur monochloride	10025-67-9	-	-	3	18	1	6	-
Sulfur pentafluoride	5714-22-7	-	-	0.075	0.75	0.01	0.1	-
Sulfur tetrafluoride	7783-60-0	-	-	0.3	1	0.1	0.4	-
Sulfuryl fluoride	2699-79-8	5	20	10	40	-	-	-
Sulprofos	35400-43-2	-	1	-	-	-	-	-
Systox[R]		See Demeton						
Talc		See Silicates						
Tantalum, metal and oxide dust	7440-25-7	-	5	-	10	-	-	-
TEDP (Sulfotep)	3689-24-5	-	0.2	-	0.6	-	-	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	-	20	-	-	-
Respirable fraction		-	5	-	-	-	-	-
TEPP	107-49-3	0.004	0.05	0.01	0.2	-	-	X
Terphenyl	26140-60-3	-	-	-	-	0.5	5	-
1,1,1,2-Tetrachloro-2,2-difluoroethane	76-11-9	500	4,170	625	5,210	-	-	-
1,1,2,2-Tetrachloro-1,2-difluoroethane	76-12-0	500	4,170	625	5,210	-	-	-
1,1,2,2-Tetrachloro-ethane	79-34-5	1	7	-	-	-	-	X
Tetrachoroethylene		See Perchloroethylene						

Limits for Air Contaminants[1] (Continued)

Substance	CAS No.[b]	Air Contaminant Limits** PEL-TWA* ppm[c]	PEL-TWA* mg/m3[d]	PEL-STEL[a] ppm[c]	PEL-STEL[a] mg/m3[d]	PEL-CEILING ppm[c]	PEL-CEILING mg/m3[d]	Skin Designation
Tetrachloromethane		See Carbon tetrachloride						
Tetrachloronaphthalene	1335-88-2	-	2	-	4	-	-	X
Tetraethyl lead (as Pb)	78-00-2	-	0.075k	-	0.3k	-	-	X
Tetrahydrofuran	109-99-9	200	590	250	735	-	-	-
Tetramethyl lead, (as Pb)	75-74-1	-	0.075k	-	0.5k	-	-	X
Tetramethyl succino-nitrile	3333-52-6	0.5	3	2	9	-	-	X
Tetranitromethane	509-14-8	1	8	-	-	-	-	-
Tetrasodium pyro-phosphate	7722-88-5	-	5	-	-	-	-	-
Tetryl (2,4,6-Trinitrophenyl-methyl-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							
Total dust		-	10	-	20	-	-	-
Respirable fraction		-	5	-	-	-	-	-
Thioglycolic acid	68-11-1	1	4	-	-	-	-	X
Thionyl chloride	7719-09-7	-	-	-	-	1	5	-
Thiram	137-26-8	-	1	-	-	-	-	-
Tin, inorganic compounds (except oxides) (as Sn)	7440-31-5	-	2	-	4	-	-	-
Tin, organic compounds (as Sn)	7440-31-5	-	0.1	-	0.2	-	-	X
Tin oxide (as Sn)	21651-19-4	-	2	-	4	-	-	-
Titanium dioxide	13463-67-7							
Total dust		-	10	-	20	-	-	-
Toluene (Toluol)	108-88-3	100	375	150	560	-	-	X
Toluene di-isocyanate (TDI)	584-84-9	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	0.4	5	-	-	-
Trichloroacetic acid	76-03-9	1	5	-	-	-	-	-
1,2,4-Trichlorobenzene	120-82-1	-	-	-	-	5	40	-
1,1,1-Trichloroethane		See Methyl chloroform						

Limits for Air Contaminants[1] (Continued)

		Air Contaminant Limits**						
		PEL-TWA*		PEL-STEL[a]		PEL-CEILING		Skin Designation
Substance	CAS No.[b]	ppm[c]	mg/m3[d]	ppm[c]	mg/m3[d]	ppm[c]	mg/m3[d]	
1,1,2-Trichloroethane	79-00-5	10	45	20	90	-	-	X
Trichloroethylene	79-01-6	50	270	200	1,080	-	-	-
Trichloromethane		See Chloroform						
Trichloronaphthalene	1321-65-9	-	5	-	10	-	-	X
1,2,3-Trichloropropane	96-18-4	10	60	75	450	-	-	X
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	1,000	7,600	1,250	9,500	-	-	-
Triethylamine	121-44-8	10	40	15	60	-	-	-
Trifluorobromomethane	75-63-8	1,000	6,100	1,200	7,300	-	-	-
Trimellitic anhydride	552-30-7	0.005	0.04	-	-	-	-	-
Trimethylamine	75-50-3	10	24	15	36	-	-	-
Trimethyl benzene	25551-13-7	25	125	35	170	-	-	-
Trimethyl phosphite	121-45-9	2	10	5	25	-	-	-
2,4,6-Trinitrophenyl		See Picric acid						
2,4,6-Trinitrophenyl-methyl 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	-	6	-	-	X
Tungsten (as W)	7440-33-7							
Insoluble compounds		-	5	-	10	-	-	-
Soluble compounds		-	1	-	3	-	-	-
Turpentine	8006-64-2	100	560	150	840	-	-	-
Uranium (as U)	7440-61-1							
Soluble compounds		-	0.05	-	-	-	-	-
Insoluble compounds		-	0.2	-	0.6	-	-	-
n-Valeraldehyde	110-62-3	50	175	-	-	-	-	-
Vanadium	1314-62-1							
Respirable dust (as V_2O_5)	-	0.05	-	-	-	-	-	-
Fume (as V_2O_5)	-	0.05	-	-	-	-	-	-
Vegetable oil mist	-							
Total dust	-	10	-	-	-	-	-	
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	75-01-4	See §1910.1017						
Vinylcyanide		See Acrylonitrile						
Vinyl cyclohexene dioxide	106-87-6	10	60	-	-	-	-	X

Limits for Air Contaminants[1] (Continued)

		Air Contaminant Limits**						
		PEL-TWA*		PEL-STEL[a]		PEL-CEILING		Skin Designation
Substance	CAS No.[b]	ppm[c]	mg/m3[d]	ppm[c]	mg/m3[d]	ppm[c]	mg/m3[d]	
Vinylidene chloride (1,1-Dichloro-ethylene)	75-35-4	1	4	-	-	-	-	-
Vinyl toluene	25013-15-4	50	240	100	485	-	-	-
VM & P Naphtha	8032-32-4	300	1,350	400	1,800	-	-	-
Warfarin	81-81-2	-	0.1	-	0.3	-	-	-
Welding fumes (total particulate)	-	-	5	-	-	-	-	-
Wood dust:								
Certain hardwoods as beech & oak	-	-	1	-	-	-	-	-
All soft 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	-	-	X
m-Xylene α, α'-diamine	1477-55-0	-	-	-	-	-	0.1	X
Xylidine	1300-73-8	0.5	2.5	-		-	-	X
Yttrium	7440-65-5	-	1	-	3	-	-	-
Zinc chloride fume	7646-85-7	-	1	-	2	-	-	-
Zinc chromate (as CrO3)	Varies with Compound	-	0.01	-	-	-	0.1	-
Zinc oxide fume	1314-13-2	-	5	-	10	-	-	-
Zinc oxide	1314-13-2							
Total dust		-	10	-	-	-	-	-
Respirable fraction		-	5	-	-	-	-	-
Zinc stearate	557-05-1							
Total dust		-	10	-	20	-	-	-
Respirable fraction		-	5	-	-	-	-	-
Zirconium compounds (as Zr)	7440-67-2	-	5	-	10	-	-	-

Footnotes to Exhibit A:
Air Contaminant Rule Limits are the most restrictive of the federal limits, ACGIH limits and existing HIOSH limits.
* The PEL-TWA's are 7- to 8-hour TWA's, unless otherwise noted.
** Unless otherwise noted, employers in General Industry (i.e., those covered by Part 2 of the HIOSH standards) may use any combination of controls to achieve these limits, until December 31, 1992.

a. STEL duration is for 15 minutes, unless otherwise noted.
b. 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.

c. Ppm are in parts of vapor or gas per million parts of contaminated air by volume at 25°C and 760 torr.
d. Mg/m^3 are approximate milligrams of substance per cubic meter of air.
e. The final benzene standard in section 1910.1028 applies to all occupational exposures to benzene except some sub segments of industry where exposures are consistently under the action level (e.g., 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 sub segments, the benzene limits in Exhibit B apply.
f. Coal tar pitch volatiles mean the fused polycyclic hydrocarbons that volatilize from the distillation residues of coal, petroleum, (excluding asphalt, CAS 8052-42-4 and CAS 64742-93-4), wood, and other organic matter.
g. Cotton dust refers to lint-free dust as measured by the vertical elutriator, cotton-dust sampler described in the Transactions of the National Conference on Dust, p. 33 by J.R. Lynch, (May 2, 1970). The PEL-TWA in the exhibit 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 cycling (sorting, blending, cleaning, and willowing) and garreting. See also section 1910.1043.
h. Fibrous glass dust means particles <7μm in diameter.
i. Oil mist as sampled by a method that does not collect vapor.
j. Compliance with the Subtilisins PEL-TWA is assessed by sampling with a high volume sampler (600-800 liters per minute) for at least 60 minutes.
k. For control of tetraethyl lead and tetramethyl lead in general room air, biologic monitoring is essential for personnel monitoring.
l. Most Occupational exposures to EGDN actually involve mixtures of EGDN and nitroglycerin (NG). This EGDN:NG mixture has a PEL-STEL of 0.1 mg/m^3.
m. See Exhibit B from the exposure limits for any operations or sectors where the exposure limits in §1910.1026 are stayed or otherwise not in effect.
n. If the exposure limit in §1910.1026 is stayed or is otherwise not in effect, the exposure limit is ceiling of 0.1 mg/m^3

EXHIBIT B (July 1, 2011)
MORE LIMITS FOR AIR CONTAMINANTS

Material	Industry Segments	Skin Design-nation	8-hour time-weighted average	Ceiling concentra-tion
Benzene	(Z37.40-1969)[1]	-	10 ppm	25 ppm
Beryllium and Beryllium Compounds	(Z37.29-1970)	-	2 µg/m^3	5 µg/m^3
Chromic acid and Chromates (as $Cr0_3$)[2]	(Z37.7-1971)			1mg/10m^3
Ethylene Dibromide	(Z37.31-1970)	X	20 ppm	30 ppm
Methyl chloride	(Z37.18-1969)	-	100 ppm	200 ppm

[1]This standard applies to the industry segments exempt from the 1 ppm 8-hour TWA and 5 ppm STEL of the benzene standard at §1910.1028 This standard also applies to any industry for which §1910.1028 is stayed or otherwise not in effect.
[2]This standard applies to any operations or sectors for which the Hexavalent Chromium standard, §1910.1026 is stayed or otherwise is not in effect