

G-1, G-2, or G-3 for the material involved.

(ii) To illustrate the formula prescribed in subdivision (i) of this subparagraph, note that isoamyl acetate has an 8-hour time weighted average limit of 100 p.p.m. (table G-1). Assume that an employee is subject to the following exposure:

Two hours exposure at 150 p.p.m.
Two hours exposure at 75 p.p.m.
Four hours exposure at 50 p.p.m.

Substituting this information in the formula, we have

$$\frac{2 \times 150 + 2 \times 75 + 4 \times 50}{8} = 81.25 \text{ p.p.m.}$$

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

(2) (i) In case of a mixture of air contaminants an employer shall compute the equivalent exposure as follows:

$$E_m = \frac{C_1}{L_1} + \frac{C_2}{L_2} + \dots + \frac{C_n}{L_n}$$

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 contaminant, from table G-1, G-2, or G-3.

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

(ii) To illustrate the formula prescribed in subdivision (i) of this subparagraph, consider the following exposures:

Material	Actual concentration of 8-hour exposure	8-hour time weighted average exposure limit
Acetone (Table G-1)	500 p.p.m.	1,000 p.p.m.
2-Butanone (Table G-1)	45 p.p.m.	200 p.p.m.
Toluene (Table G-2)	40 p.p.m.	200 p.p.m.

Substituting in the formula, we have:

$$E_m = \frac{500}{1,000} + \frac{45}{200} + \frac{40}{200}$$

$$E_m = 0.500 + 0.225 + 0.200$$

$$E_m = 0.925$$

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

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

TABLE G-1

Substance	p.p.m.*	mg./M ³ b
Acetaldehyde	200	360
Acetic acid	10	25
Acetic anhydride	5	20
Acetone	1,000	2,400
Acetonitrile	40	70
Acetylene dichloride, see 1, 2-Dichloroethylene		
Acetylene tetrabromide	1	14
Acrolein	0.1	0.25
Acrylamide—Skin		0.3
Acrylonitrile—Skin	20	45
Aldrin—Skin		0.25
Allyl alcohol—Skin	2	5
Allyl chloride	1	3
**C Allylglycidyl ether (AGE)	10	45
Allyl propyl disulfide	2	12
2-Aminoethanol, see Ethanol-amine		
2-Aminopyridine	0.5	2
**Aminonla	50	35
Ammonium sulfamate (Am-mate)		15
n-Amyl acetate	100	525
sec-Amyl acetate	125	650
Aniline—Skin	5	19
Anisidine (o, p-isomers)—Skin		0.5
Antimony and compounds (as Sb)		0.5
ANTU (alpha naphthyl thiourea)		0.3
Arsenic and compounds (as As)		0.5
Arsine	0.05	0.2
Azinphos-methyl—Skin		0.2
Barium (soluble compounds)		0.5
p-Benzoquinone, see Quinone		
Benzoyl peroxide		5
Benzyl chloride	1	5
Biphenyl, see Diphenyl		
Bisphenol A, see Diglycidyl ether		
Boron oxide		15
C Boron trifluoride	1	3
Bromine	0.1	0.7
Bromoform—Skin	0.5	5
Butadiene (1, 3-butadiene)	1,000	2,200
Butanethiol, see Butyl mercaptan		
2-Butanone	200	590
2-Butoxy ethanol (Butyl Cellosolve)—Skin	50	240
Butyl acetate (n-butyl acetate)	150	710
sec-Butyl acetate	200	950
tert-Butyl acetate	200	950
Butyl alcohol	100	300
sec-Butyl alcohol	150	450
tert-Butyl alcohol	100	300
C Butylamine—Skin	5	15
C tert-Butyl chromate (as CrO ₃)—Skin		0.1
n-Butyl glycidyl ether (BGE)	50	270
*Butyl mercaptan	10	35
p-tert-Butyltoluene	10	60
Calcium arsenate		1
Calcium oxide		5
**Camphor	2	5
Carbaryl (Sevin®)		5
Carbon black		3.5
Carbon dioxide	5,000	9,000
Carbon monoxide	50	55
Chloroform—Skin		0.5
Chlorinated camphene—Skin		0.5
Chlorinated diphenyl oxide		0.5
*Chlorine	1	3
Chlorine dioxide	0.1	0.3
C Chlorine trifluoride	0.1	0.4
C Chloroacetaldehyde	1	3
α-Chloroacetophenone (phenacylchloride)	0.05	0.3
Chlorobenzene (monochlorobenzene)	75	350
o-Chlorobenzylidene malononitrile (OCBM)	0.05	0.4
Chlorobromomethane	200	1,050
2-Chloro-1,3-butadiene, see Chloroprene		
Chlorodiphenyl (42 percent Chlorine)—Skin		1
Chlorodiphenyl (54 percent Chlorine)—Skin		0.5
1-Chloro-2,3-epoxypropane, see Epichlorohydrin		
2-Chloroethanol, see Ethylene chlorohydrin		
Chloroethylene, see Vinyl chloride		
C Chloroform (trichloromethane)	50	240
1-Chloro-1-nitropropane	20	100
Chloropicrin	0.1	0.7
Chloroprene (2-chloro-1,3-butadiene)—Skin	25	90

TABLE G-1—Continued

Substance	p.p.m.*	mg./M ³ b
Chromium, sol. chromic, chromous salts as Cr		0.5
Metal and insol. salts		1
Coal tar pitch volatiles (benzene soluble fraction) anthracene, BaP, phenanthrene, acridine, chrysene, pyrene		0.2
Cobalt, metal fume and dust		0.1
Copper fume		0.1
Dusts and Mists		1
Cotton dust (raw)		1
Crag® herbicide		15
Cresol (all isomers)—Skin	5	22
Crotonaldehyde	2	6
Cumene—Skin	50	245
Cyanide (as CN)—Skin		5
Cyclohexane	300	1,050
Cyclohexanol	50	200
Cyclohexanone	50	200
Cyclohexene	300	1,015
Cyclopentadiene	75	200
2, 4-D		10
DDT—Skin		1
DDVP, see Dichlorvos		
Decaborane—Skin	0.05	0.3
Demeton®—Skin		0.1
Diacetone alcohol (4-hydroxy-4-methyl-2-pentanone)	50	240
1,2-diaminoethane, see Ethylenediamine		
Diazomethane	0.2	0.4
Diborane	0.1	0.1
Dibutylphthalate		5
C o-Dichlorobenzene	50	300
p-Dichlorobenzene	75	450
Dichlorodifluoromethane	1,000	4,950
1,3-Dichloro-5,5-dimethyl hydantoin		0.2
1,1-Dichloroethane	100	400
1,2-Dichloroethylene	200	790
C Dichloroethyl ether—Skin	15	90
Dichloromethane, see Methylenechloride		
Dichloromonofluoromethane	1,000	4,200
C 1,1-Dichloro-1-nitroethane	10	60
1,2-Dichloropropane, see Propylenedichloride		
Dichlorotetrafluoroethane	1,000	7,000
Dichlorvos (DDVP)—Skin		1
Dieldrin—Skin		0.25
Diethylamine	25	75
Diethylamino ethanol—Skin	10	50
Diethylether, see Ethyl ether		
Diffuorodibromomethane	100	860
C Diglycidyl ether (DGE)	0.5	2.8
Dihydroxybenzene, see Hydroquinone		
Diisobutyl ketone	50	290
Diisopropylamine—Skin	5	20
Dimethoxymethane, see Methylal		
Dimethyl acetamide—Skin	10	35
Dimethylamine	10	18
Dimethylaminobenzene, see Xylidene		
Dimethylaniline (N-dimethylaniline)—Skin	5	25
Dimethylbenzene, see Xylene		
Dimethyl 1,2-dibromo-2,2-dichloroethyl phosphate, (Dibrom)		3
Dimethylformamide—Skin	10	30
2,6-Dimethylheptanone, see Diisobutyl ketone		
1,1-Dimethylhydrazine—Skin	0.5	1
Dimethylphthalate		5
Dimethylsulfate—Skin	1	5
Dinitrobenzene (all isomers)—Skin		1
Dinitro-o-cresol—Skin		0.2
Dinitrotoluene—Skin		1.5
Dioxane (Diethylene dioxide)—Skin	100	360
Diphenyl	0.2	1
Diphenylmethane diisocyanate (see Methylene bisphenyl isocyanate (MDI))		
Dipropylene glycol methyl ether—Skin	100	600
Di-sec. octyl phthalate (Di-2-ethylhexylphthalate)		5
Endrin—Skin		0.1
Epichlorohydrin—Skin	5	19
EPN—Skin		0.5
1,2-Epoxypropane, see Propyleneoxide		
2,3-Epoxy-1-propanol, see Glycidol		

See footnotes at end of table.

American National Standards Institute, 1430 Broadway, New York, NY 10018.

Subpart G—Occupational Health and Environmental Control

§ 1910.93 Air contaminants.

An employee's exposure to any material listed in table G-1, G-2, or G-3 of this section shall be limited in accordance with the requirements of the following paragraphs of this section.

(a) Table G-1:

(1) Materials with names preceded by "C"—Ceiling Values. An employee's exposure to any material in table G-1, the name of which is preceded by a "C" (e.g., C Boron trifluoride), shall at no time exceed the ceiling value given for that material in the table.

(2) Other materials—8-hour time weighted averages. An employee's exposure to any material in table G-1, the name of which is not preceded by "C", in any 8-hour work shift of a 40-hour work week, shall not exceed the 8-hour time weighted average given for that material in the table.

(b) Table G-2:

(1) 8-hour time weighted averages. 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 the table.

(2) Acceptable ceiling concentrations. 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 time period, and up to a concentration not exceeding the maximum duration and concentration allowed in the column under "acceptable maximum peak above the acceptable ceiling concentration for an 8-hour shift".

(3) Example. During an 8-hour work shift, an employee may be exposed to a concentration of Benzene above 25 p.p.m. (but never above 50 p.p.m.) only for a maximum period of 10 minutes. Such exposure must be compensated by exposures to concentrations less than 10 p.p.m. so that the cumulative exposure for the entire 8-hour work shift does not exceed a weighted average of 10 p.p.m.

(c) Table G-3: An employee's exposure to any material 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 material in the table.

(d) Computation formulae:

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

$$E = \frac{C_1 T_1 + C_2 T_2 + \dots + C_n T_n}{8}$$

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 limit in table

be located within easy view of an ascending passenger and not more than 2 feet above the top terminal landing.

(b) In addition to the sign required by subdivision (a) of this subdivision, a red warning light of not less than 40-watt rating shall be provided immediately below the upper landing terminal and so located as to shine in the passenger's face.

(iii) Visitor Warning. A conspicuous sign having the following legend—AUTHORIZED PERSONNEL ONLY—shall be displayed at each landing. The sign shall be of block letters not less than 2 inches in height and shall be of a color offering high contrast with the background color.

(d) Operating rules—(1) Proper use of manlifts. No freight, packaged goods, pipe, lumber, or construction materials of any kind shall be handled on any manlift.

(e) Periodic inspection—(1) Frequency. All manlifts shall be inspected by a competent designated person at intervals of not more than 30 days. Limit switches shall be checked weekly. Manlifts found to be unsafe shall not be operated until properly repaired.

(2) Items covered. This periodic inspection shall cover but is not limited to the following items:

Steps.
Step Fastenings.
Rails.
Rail Supports and Fastenings.
Rollers and Slides.
Belt and Belt Tension.
Handholds and Fastenings.
Floor Landings.
Guardrails.
Lubrication.
Limit Switches.
Warning Signs and Lights.
Illumination.
Drive Pulley.
Bottom (boot) Pulley and Clearance.
Pulley Supports.
Motor.
Driving Mechanism.
Brake.
Electrical Switches.
Vibration and Misalignment.
"Skip" on up or down run when mounting step (indicating worn gears).

(3) Inspection log. A written record shall be kept of findings at each inspection. Records of inspection shall be made available to the Assistant Secretary of Labor or his duly authorized representative.

(Source: ANSI A90.1-1969 Safety Code for Manlifts.)

§ 1910.69 Sources of standards.

Sec.	Source
1910.66	ANSI A120.1-1970 Safety Code for Powered Platforms for Exterior Building Maintenance.
1910.67	ANSI A92.2-1969. American National Standard for Vehicle-Mounted Elevating and Rotating Work Platforms.
1910.68	ANSI A90.1-1969 Safety Code for Manlifts.

§ 1910.70 Standards organizations.

Specific standards of the following organizations have been referenced in this subpart. Copies of the standards may be obtained from the issuing organization.

(b) An electronic device.

(c) A switch actuated by a lever, rod, or plate, the latter to be placed on the "up" side of the head pulley so as to just clear a passing step.

(ii) Manual reset location. After the manlift has been stopped by a stop device it shall be necessary to reset the automatic stop manually. The device shall be so located that a person resetting it shall have a clear view of both the "up" and "down" runs of the manlift. It shall not be possible to reset the device from any step or platform.

(iii) Cut-off point. The initial limit stop device shall function so that the manlift will be stopped before the loaded step has reached a point 24 inches above the top terminal landing.

(iv) Electrical requirements. (a) Where such switches open the main motor circuit directly they shall be of the multipole type.

(b) Where electronic devices are used they shall be so designed and installed that failure will result in shutting off the power to the driving motor.

(c) Where flammable vapors or dusts may be present all electrical installations shall be in accordance with the National Electrical Code, NFPA 70-1971; ANSI C1-1971 (Rev. of 1968), requirements for such locations.

(d) Unless of the oil-immersed type controller contacts carrying the main motor current shall be copper to carbon or equal, except where the circuit is broken at two or more points simultaneously.

(6) Emergency Stop—(i) General. An emergency stop means shall be provided.

(ii) Location. This stop means shall be within easy reach of the ascending and descending runs of the belt.

(iii) Operation. This stop means shall be so connected with the control lever or operating mechanism that it will cut off the power and apply the brake when pulled in the direction of travel.

(iv) Rope. If rope is used, it shall be not less than three-eighths inch in diameter. Wire rope, unless marlin-covered, shall not be used.

(7) Instruction and warning signs—

(i) Instruction signs at landings or belts. Signs of conspicuous and easily read style giving instructions for the use of the manlift shall be posted at each landing and stenciled on the belt.

(ii) Such signs shall be of letters not less than 1 inch in height and of a color offering high contrast with the surface on which it is stenciled or painted (white or yellow on black or black on white or gray).

(iii) The instructions shall read approximately as follows:

At the Belt.
At the Handholds.
Stop—Pull Rope.

(iv) Top floor warning sign and light. At the top floor an illuminated sign shall be displayed bearing the following reading:

"TOP FLOOR—GET OFF"

It shall be in block letters not less than 2 inches in height. This sign shall

TABLE G-1—Continued

Substance	p.p.m.*	mg./M ³ b
2-Methoxyethanol, see Ethylmer-		
2-Methoxyethanol—Skin	3	6
2-Methoxyethanol—Skin	200	740
2-Methoxyethyl acetate (Cello-		
solve acetate)—Skin	100	540
2-Methyl acetate—Skin	400	1,400
2-Methyl acrylate—Skin	25	100
2-Methyl alcohol (ethanol)	1,000	1,900
2-Methylamine	10	18
2-Methyl sec-amy] ketone (5-		
methyl-3-heptanone)	25	130
2-Methyl benzene	100	435
2-Methyl bromide	200	890
2-Methyl butyl ketone (3-		
Heptanone)	50	230
2-Methyl chloride	1,000	2,600
2-Methyl ether	400	1,200
2-Methyl formate	100	300
2-Ethyl mercaptan	10	25
2-Ethyl silicate	100	850
Ethylene chlorohydrin—Skin	5	16
Ethylenediamine	10	25
Ethylene dibromide, see 1,2-		
Dibromoethane		
Ethylene dichloride, see 1,2-		
Dichloroethane		
C Ethylene glycol dinitrate		
and/or Nitroglycerin—Skin	40.2	1
Ethylene glycol monomethyl		
ether acetate, see Methyl		
cellosolve acetate		
Ethylene imine—Skin	0.5	1
Ethylene oxide	50	90
Ethylidene chloride, see 1,1-		
Dichloroethane		
N-Ethylmorpholine—Skin	20	94
Ferbam		15
Ferrovandium dust		1
Fluoride (as F)		2.5
Fluorine	0.1	0.2
Fluorotrichloromethane	1,000	5,600
Formic acid	5	9
Furfural—Skin	5	20
Furfuryl alcohol	50	200
Glycidol (2,3-Epoxy-1-		
propanol)	50	150
Glycol monomethyl ether, see		
2-Ethoxyethanol		
Guthion ®, see Azinphos-		
methyl		
Hafnium		0.5
Heptachlor—Skin		0.5
Heptane (n-heptane)	500	2,000
Hexachloroethane—Skin	1	10
Hexachloronaphthalene—Skin		0.2
Hexane (n-hexane)	500	1,800
2-Hexanone	100	410
Hexone (Methyl isobutyl		
ketone)	100	410
sec-Hexyl acetate	50	300
Hydrazine—Skin	1	1.3
Hydrogen bromide	3	10
C Hydrogen chloride	5	7
Hydrogen cyanide—Skin	10	11
Hydrogen peroxide (90%)	1	1.4
Hydrogen selenide	0.05	0.2
Hydroquinone		2
C Iodine	0.1	1
Iron oxide fume		10
Isoamyl acetate	100	525
Isoamyl alcohol	100	360
Isobutyl acetate	150	700
Isobutyl alcohol	100	300
Isophorone	25	140
Isopropyl acetate	250	950
Isopropyl alcohol	400	980
Isopropylamine	5	12
Isopropylether	500	2,100
Isopropyl glycidyl ether (IGE)	50	240
Ketene	0.5	0.9
Lead arsenate		0.15
Lindane—Skin		0.5
Lithium hydride		0.025
L.P.G. (liquefied petroleum		
gas)	1,000	1,800
Magnesium oxide fume		15
Malathion—Skin		15
Maleic anhydride	0.25	5
C Manganese		1
Mesityl oxide	25	100
Methanethiol, see Methyl		
mercaptan		
Methoxychlor		15
2-Methoxyethanol, see Methyl		
cellosolve		
Methyl acetate	200	610
Methyl acetylene (propyne)	1,000	1,650
Methyl acetylene-propadiene		
mixture (MAPP)	1,000	1,600
Methyl acrylate—Skin	10	35
Methylal (dimethoxymethane)	1,000	3,100
Methyl alcohol (methanol)	200	260
Methylamine	10	12
Methyl amyl alcohol, see		
Methyl isobutyl carbamol		

TABLE G-1—Continued

Substance	p.p.m.*	mg./M ³ b
Methyl (n-amy] ketone (2-		
Heptanone)	100	465
C Methyl bromide—Skin	20	80
Methyl butyl ketone, see 2-		
Hexanone		
Methyl cellosolve—Skin	25	80
Methyl cellosolve acetate—Skin	25	120
Methyl chloroform	350	1,900
Methyleyclohexane	500	2,000
Methyleyclohexanol	100	470
o-Methyleyclohexanone—Skin	100	460
Methyl ethyl ketone (MEK),		
see 2-Butanone		
Methyl formate	100	250
Methyl iodide—Skin	5	28
Methyl isobutyl carbamol—Skin	25	100
Methyl isobutyl ketone, see		
Hexone		
Methyl isocyanate—Skin	0.02	0.05
C Methyl mercaptan	10	20
Methyl methacrylate	100	410
Methyl propyl ketone, see 2-		
Pentanone		
C α Methyl styrene	100	450
C Methylene bisphenyl		
isocyanate (MDI)	0.02	0.2
Molybdenum:		
Soluble compounds		5
Insoluble compounds		15
Monomethyl aniline—Skin	2	9
C Monomethyl hydrazine—		
Skin	0.2	0.35
Morpholine—Skin	20	70
Naphtha (coal tar)	100	400
Naphthalene	10	50
Nickel carbonyl	0.001	0.007
Nickel, metal and soluble		
cmpds, as Ni		1
Nicotine—Skin		0.5
Nitric acid	2	5
Nitric oxide	25	30
p-Nitroaniline—Skin	1	6
Nitrobenzene—Skin	1	5
p-Nitrochlorobenzene—Skin		1
Nitroethane	100	310
Nitrogen dioxide	5	9
Nitrogen trifluoride	10	29
Nitroglycerin—Skin	0.2	2
Nitromethane	100	250
1-Nitropropane	25	90
2-Nitropropane	25	90
Nitrotoluene—Skin	5	30
Nitrotrichloromethane, see		
Chloroform		
Octachloronaphthalene—Skin		0.1
*Octane	500	2,350
*Oil mist, mineral		5
Osmium tetroxide		0.002
Oxalic acid		1
Oxygen difluoride	0.05	0.1
Ozone	0.1	0.2
Paraquat—Skin		0.5
Parathion—Skin		0.1
Pentaborane	0.005	0.01
Pentachloronaphthalene—Skin		0.5
Pentachlorophenol—Skin		0.5
*Pentane	1,000	2,950
2-Pentanone	200	700
Perchloromethyl mercaptan	0.1	0.8
Perchloryl fluoride	3	13.5
Petroleum distillates (naphtha)	500	2,000
Phenol—Skin	5	19
p-Phenylene diamine—Skin		0.1
Phenyl ether (vapor)	1	7
Phenyl ether-biphenyl		
mixture (vapor)	1	7
Phenylethylene, see Styrene		
Phenyl glycidyl ether (PGE)	10	60
Phenylhydrazine—Skin	5	22
Phosdrin (Aievinphos ®)—		
Skin		0.1
Phosgene (carbonyl chloride)	0.1	0.4
Phosphine	0.3	0.4
Phosphoric acid		1
Phosphorus (yellow)		0.1
Phosphorus pentachloride	1	1
Phosphorus pentasulfide		1
Phosphorus trichloride	0.5	3
Phthalic anhydride	2	12
Picric acid—Skin		0.1
Pivalic acid (2-Pivalyl-1,3-		
indandione)		0.1
Platinum (Soluble Salts) as		
Pt		0.002
Propargyl alcohol—Skin	1	1
Propane	1,000	1,800
n-Propyl acetate	200	840
Propyl alcohol	200	500
n-Propyl nitrate	25	110
Propylene dichloride	75	350
Propylene imine—Skin	2	5
Propylene oxide	100	240
Propyne, see Methylacetylene		
Pyrethrum		5
Pyridine	5	15
Quinone	0.1	0.4
Radon—Skin		1.5

TABLE G-1—Continued

Substance	p.p.m.*	mg./M ³ b
Rhodium, Metal fume and		
dusts, as Rh		0.1
Soluble salts		0.001
Rommel		10
Rotenone (commercial)		5
Selenium compounds (as Se)		0.2
Selenium hexafluoride	0.05	0.4
Silver, metal and soluble com-		
pounds		0.01
Sodium fluoroacetate (1080)—		
Skin		0.05
Sodium hydroxide		2
Stibine	0.1	0.5
*Stoddard solvent	500	2,950
Strychnine		0.15
Sulfur dioxide	5	13
Sulfur hexafluoride	1,000	6,000
Sulfuric acid		1
Sulfur monochloride	1	6
Sulfur pentafluoride	0.025	0.25
Sulfuryl fluoride	5	20
Systox, see Demeton ®		
2,4,5-T		10
Tantalum		5
TEDP—Skin		0.2
Tellurium		0.1
Tellurium hexafluoride	0.02	0.2
TEPP—Skin		0.05
C Terphenyls	1	9
1,1,1,2-Tetrachloro-2,2-difluoro-		
ethane	500	4,170
1,1,2,2-Tetrachloro-1,2-difluoro-		
ethane	500	4,170
1,1,2,2-Tetrachloroethane—Skin	5	35
Tetrachloroethylene, see Per-		
chloroethylene		
Tetrachloromethane, see Carbon		
tetrachloride		
Tetrachloronaphthalene—Skin		2
Tetraethyl lead (as Pb)—Skin		0.075
Tetrahydrofuran	200	590
Tetramethyl lead (as Pb)—		
Skin		0.07
Tetramethyl succinonitrile—		
Skin	0.5	3
Tetranitromethane	1	8
Tetryl (2,4,6-trinitrophenyl-		
methylamine)—Skin		1.5
Thallium (soluble com-		
pounds)—Skin as Tl		0.1
Thiram		5
Tin (inorganic cmpds, except		
oxides)		2
Tin (organic cmpds)		0.1
C Toluene-2,4-disocyanate	0.02	0.14
o-Toluidine—Skin	5	22
Toxaphene, see Chlorinated		
camphene		
Tributyl phosphate		5
1,1,1-Trichloroethane see		
Methyl chloroform		
1,1,2-Trichloroethane—Skin	10	45
Titanium dioxide		15
Trichloromethane, see Chloro-		
form		
Trichloronaphthalene—Skin		5
1,2,3-Trichloropropane	50	300
1,1,2-Trichloro 1,2,2-trifluoro-		
ethane	1,000	7,600
Triethylamine	25	100
Trifluoromethoxybromomethane	1,000	6,100
2,4,6-Trinitrophenol, see Picric		
acid		
2,4,6-Trinitrophenylmethyl-		
nitramine, see Tetryl		
Trinitrotoluene—Skin		1.5
Triorthocresyl phosphate		0.1
Triphenyl phosphate		3
Turpentine	100	560
Uranium (soluble compounds)		0.05
Uranium (insoluble compounds)		0.25
C Vanadium:		
V ₂ O ₅ dust		0.5
V ₂ O ₅ fume		0.1
Vinyl benzene, see Styrene		
*C Vinyl chloride	500	1,300
Vinylamide, see Acrylonitrile		
Vinyl toluene	100	480
Warfarin		0.1
Xylene (xylol)	100	435
Xylidine—Skin	5	25
Yttrium		1
Zinc chloride fume		1
Zinc oxide fume		5
Zirconium compounds (as Zr)		5

*1970 Addition.

* Parts of vapor or gas per million parts of contaminated air by volume at 25° C. and 760 mm. Hg pressure.

* Approximate milligrams of particulate per cubic meter of air.

(No footnote "c" is used to avoid confusion with ceiling value notations.)

* An atmospheric concentration of not more than 0.02 p.p.m., or personal protection may be necessary to avoid headache.

* As sampled by method that does not collect vapor.

* For control of general room air, biologic monitoring is essential for personnel control.

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
Benzene (Z37.4-1969)	10 p.p.m.	25 p.p.m.	50 p.p.m.	10 minutes.
Beryllium and beryllium compounds (Z37.2-1970)	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 (Z37.5-1970)	0.1 mg./M ³	3 mg./M ³		
Cadmium dust (Z37.5-1970)	0.2 mg./M ³	0.6 mg./M ³		
Carbon disulfide (Z37.3-1968)	20 p.p.m.	30 p.p.m.	100 p.p.m.	Do.
Carbon tetrachloride (Z37.17-1967)	10 p.p.m.	25 p.p.m.	200 p.p.m.	5 minutes in any 4 hours.
Ethylene dibromide (Z37.31-1970)	20 p.p.m.	30 p.p.m.	50 p.p.m.	5 minutes.
Ethylene dichloride (Z37.21-1969)	50 p.p.m.	100 p.p.m.	200 p.p.m.	5 minutes in any 3 hours.
Formaldehyde (Z37.16-1967)	3 p.p.m.	5 p.p.m.	10 p.p.m.	30 minutes.
Hydrogen fluoride (Z37.23-1969)	do			
Fluoride as dust (Z37.23-1969)	2.5 mg./M ³			
Lead and its inorganic compounds (Z37.11-1969)	0.2 mg./M ³			
Methyl chloride (Z37.18-1969)	100 p.p.m.	200 p.p.m.	300 p.p.m.	5 minutes in any 3 hours.
Methylene Chloride (Z37.3-1969)	500 p.p.m.	1,000 p.p.m.	2,000 p.p.m.	5 minutes in any 2 hours.
Organo (alkyl) mercury (Z37.30-1969)	0.01 mg./M ³	0.04 mg./M ³		
Styrene (Z37.15-1969)	100 p.p.m.	200 p.p.m.	600 p.p.m.	5 minutes in any 3 hours.
Trichloroethylene (Z37.19-1967)	do	do	300 p.p.m.	5 minutes in any 2 hours.
Tetrachloroethylene (Z37.22-1967)	do	do	do	5 minutes in any 3 hours.
Toluene (Z37.12-1967)	200 p.p.m.	300 p.p.m.	500 p.p.m.	10 minutes.
Hydrogen sulfide (Z37.2-1966)		20 p.p.m.	50 p.p.m.	10 minutes once only if no other measurable exposure occurs.
Mercury (Z37.8-1971)		1 mg./10M ³		
Chromic acid and chromates (Z37.7-1971)		do		

TABLE G-3—MINERAL DUSTS

Substance	Mppcf *	Mg/M ³
Silica:		
Crystalline:		
Quartz (respirable).....	250 [†]	10mg/M ³ =
Quartz (total dust).....	%SiO ₂ +5	%SiO ₂ +2 30mg/M ³
Cristobalite: Use ½ the value calculated from the count or mass formulae for quartz.		%SiO ₂ +2
Tridymite: Use ½ the value calculated from the formulae for quartz.		
Amorphous, including natural diatomaceous earth.....	20	80mg/M ³ %SiO ₂
Silicates (less than 1% crystalline silica):		
Mica.....	20	
Soapstone.....	20	
Talc (non-asbestos-form).....	20 [‡]	
Talc (fibrous). Use asbestos limit		
Tremolite (see talc, fibrous)		
Portland cement.....	50	
Graphite (natural).....	15	
Coal dust (respirable fraction less than 5% SiO ₂).....		2.4mg/M ³ or 10mg/M ³
For more than 5% SiO ₂		%SiO ₂ +2
Inert or Nuisance Dust:		
Respirable fraction.....	15	5mg/M ³
Total dust.....	50	15mg/M ³

NOTE: Conversion factors—
mmpcf×35.3=million particles per cubic meter
=particles per c.c.

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

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

‡ As determined by the membrane filter method at 430×phase contrast magnification.

§ 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:

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

Aerodynamic diameter
(unit density sphere)

Percent passing
selector

2	90
2.5	75
3.5	50
5.0	25
10	0

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.

§ 1910.93a Asbestos.

(a) **Definitions.** For the purpose of this section, (1) "Asbestos" includes chrysotile, amosite, crocidolite, tremolite, anthophyllite, and actinolite.

(2) "Asbestos fibers" means asbestos fibers longer than 5 micrometers.

(b) **Permissible exposure to airborne concentrations of asbestos fibers—**(1) **Standard effective July 7, 1972.** The 8-hour time-weighted average airborne concentrations of asbestos fibers to which any employee may be exposed shall not exceed five fibers, longer than 5 micrometers, per cubic centimeter of air, as determined by the method prescribed in paragraph (e) of this section.

(2) **Standard effective July 1, 1976.** The 8-hour time-weighted average airborne concentrations of asbestos fibers to which any employee may be exposed shall not exceed two fibers, longer than 5 micrometers, per cubic centimeter of air, as determined by the method prescribed in paragraph (e) of this section.

(3) **Ceiling concentration.** No employee shall be exposed at any time to airborne concentrations of asbestos fibers in excess of 10 fibers, longer than 5 micrometers, per cubic centimeter of air, as determined by the method prescribed in paragraph (e) of this section.

(c) **Methods of compliance—**(1) **Engineering methods.** (i) **Engineering controls.** Engineering controls, such as, but not limited to, isolation, enclosure, exhaust ventilation, and dust collection, shall be used to meet the exposure limits prescribed in paragraph (b) of this section.

(ii) **Local exhaust ventilation.** (a) Local exhaust ventilation and dust collection systems shall be designed, constructed, installed, and maintained in accordance with the American National Standard Fundamentals Governing the Design and Operation of Local Exhaust Systems, ANSI Z9.2-1971, which is incorporated by reference herein.

(b) See § 1910.6 concerning the availability of ANSI Z9.2-1971, and the maintenance of a historic file in connection therewith. The address of the American National Standards Institute is given in § 1910.100.

(iii) **Particular tools.** All hand-operated and power-operated tools which may produce or release asbestos fibers in excess of the exposure limits prescribed in paragraph (b) of this section, such as, but not limited to, saws, scorers, abrasive wheels, and drills, shall be provided with local exhaust ventilation systems in accordance with subdivision (ii) of this subparagraph.

(2) **Work practices—**(i) **Wet methods.** Insofar as practicable, asbestos shall be handled, mixed, applied, removed, cut, scored, or otherwise worked in a wet state sufficient to prevent the emission of airborne fibers in excess of the exposure limits prescribed in paragraph (b) of this section, unless the usefulness of the product would be diminished thereby.

(ii) **Particular products and operations.** No asbestos cement, mortar, coating, grout, plaster, or similar material containing asbestos shall be removed from bags, cartons, or other containers in which they are shipped, without being either wetted, or enclosed, or ventilated so as to prevent effectively the release of airborne asbestos fibers in excess of the limits prescribed in paragraph (b) of this section.

(iii) **Spraying, demolition, or removal.** Employees engaged in the spraying of asbestos, the removal, or demolition of pipes, structures, or equipment covered or insulated with asbestos, and in the removal or demolition of asbestos insulation or coverings shall be provided with respiratory equipment in accordance with paragraph (d) (2) (iii) of this section and with special clothing in accordance with paragraph (d) (3) of this section.

(d) **Personal protective equipment—**(1) Compliance with the exposure limits prescribed by paragraph (b) of this section may not be achieved by the use of respirators or shift rotation of employees, except:

(i) During the time period necessary to install the engineering controls and to institute the work practices required by paragraph (c) of this section;

(ii) In work situations in which the methods prescribed in paragraph (c) of

1) Employees in this section are either technically not feasible or feasible to an extent insufficient to reduce the airborne concentration of asbestos fibers below the limits prescribed by paragraph (b) of this section: or

(iii) In emergencies.

(iv) Where both respirators and personnel rotation are allowed by subdivisions (i), (ii), or (iii) of this subparagraph, and both are practicable, personnel rotation shall be preferred and used.

(2) Where a respirator is permitted by subparagraph (1) of this paragraph, it shall be selected from among those approved by the Bureau of Mines, Department of the Interior, or the National Institute for Occupational Safety and Health, Department of Health, Education, and Welfare, under the provisions of 30 CFR Part 11 (37 F.R. 6244, Mar. 25, 1972), and shall be used in accordance with subdivisions (i), (ii), (iii), and (iv) of this subparagraph.

(i) *Air purifying respirators.* A reusable or single use air purifying respirator, or a respirator described in subdivision (ii) or (iii) of this subparagraph, shall be used to reduce the concentrations of airborne asbestos fibers in the respirator below the exposure limits prescribed in paragraph (b) of this section, when the ceiling or the 8-hour time-weighted average airborne concentrations of asbestos fibers are reasonably expected to exceed

more than 10 times those limits.

(ii) *Powered air purifying respirators.* A full facepiece powered air purifying respirator, or a powered air purifying respirator described in subdivision (iii) of this subparagraph, shall be used to reduce the concentrations of airborne asbestos fibers in the respirator below the exposure limits prescribed in paragraph (b) of this section, when the ceiling or the 8-hour time-weighted average concentrations of airborne asbestos fibers are reasonably expected to exceed 10 times, but not 100 times, those limits.

(iii) *Type "C" supplied-air respirators.* A type "C" continuous flow or pressure-demand, supplied-air respirator shall be used to reduce the concentrations of airborne asbestos fibers in the respirator below the exposure limits prescribed in paragraph (b) of this section, when the ceiling or the 8-hour time-weighted average airborne concentrations of asbestos fibers are reasonably expected to exceed 100 times those limits.

(iv) *Establishment of a respirator program.* (a) The employer shall establish a respirator program in accordance with the requirements of the American National Standards Practices for Respiratory Protection, ANSI Z88.2-1969, which is incorporated by reference herein.

(b) See § 1910.6 concerning the availability of ANSI Z88.2-1969 and the maintenance of an historic file in connection therewith. The address of the American National Standards Institute is given in § 1910.100.

(c) No employee shall be assigned to work requiring the use of respirators if,

based upon his most recent examination, an examining physician determines that the employee will be unable to function normally wearing a respirator, or that the safety or health of the employee or other employees will be impaired by his use of a respirator. Such employee shall be rotated to another job or given the opportunity to transfer to a different position whose duties he is able to perform with the same employer, in the same geographical area and with the same seniority, status, and rate of pay he had just prior to such transfer, if such a different position is available.

(3) *Special clothing:* The employer shall provide, and require the use of, special clothing, such as coveralls or similar whole body clothing, head coverings, gloves, and foot coverings for any employee exposed to airborne concentrations of asbestos fibers, which exceed the ceiling level prescribed in paragraph (b) of this section.

(4) *Change rooms:* (i) At any fixed place of employment exposed to airborne concentrations of asbestos fibers in excess of the exposure limits prescribed in paragraph (b) of this section, the employer shall provide change rooms for employees working regularly at the place.

(ii) *Clothes lockers:* The employer shall provide two separate lockers or containers for each employee, so separated or isolated as to prevent contamination of the employee's street clothes from his work clothes.

(iii) *Laundrying:* (a) Laundering of asbestos contaminated clothing shall be done so as to prevent the release of airborne asbestos fibers in excess of the exposure limits prescribed in paragraph (b) of this section.

(b) Any employer who gives asbestos-contaminated clothing to another person for laundering shall inform such person of the requirement in (a) of this subdivision to effectively prevent the release of airborne asbestos fibers in excess of the exposure limits prescribed in paragraph (b) of this section.

(c) Contaminated clothing shall be transported in sealed impermeable bags, or other closed, impermeable containers, and labeled in accordance with paragraph (g) of this section.

(e) *Method of measurement.* All determinations of airborne concentrations of asbestos fibers shall be made by the membrane filter method at 400-450 X (magnification) (4 millimeter objective) with phase contrast illumination.

(f) *Monitoring—(1) Initial determinations.* Within 6 months of the publication of this section, every employer shall cause every place of employment where asbestos fibers are released to be monitored in such a way as to determine whether every employee's exposure to asbestos fibers is below the limits prescribed in paragraph (b) of this section. If the limits are exceeded, the employer shall immediately undertake a compliance program in accordance with paragraph (c) of this section.

(2) *Personal monitoring—(i) Samples* shall be collected from within the

breathing zone of the employees, on membrane filters of 0.8 micrometer porosity mounted in an open-face filter holder. Samples shall be taken for the determination of the 8-hour time-weighted average airborne concentrations and of the ceiling concentrations of asbestos fibers.

(ii) *Sampling frequency and patterns.* After the initial determinations required by subparagraph (1) of this paragraph, samples shall be of such frequency and pattern as to represent with reasonable accuracy the levels of exposure of employees. In no case shall the sampling be done at intervals greater than 6 months for employees whose exposure to asbestos may reasonably be foreseen to exceed the limits prescribed by paragraph (b) of this section.

(3) *Environmental monitoring—(i) samples* shall be collected from areas of a work environment which are representative of the airborne concentrations of asbestos fibers which may reach the breathing zone of employees. Samples shall be collected on a membrane filter of 0.8 micrometer porosity mounted in an open-face filter holder. Samples shall be taken for the determination of the 8-hour time-weighted average airborne concentrations and of the ceiling concentrations of asbestos fibers.

(ii) *Sampling frequency and patterns.* After the initial determinations required by subparagraph (1) of this paragraph, samples shall be of such frequency and pattern as to represent with reasonable accuracy the levels of exposure of the employees. In no case shall sampling be at intervals greater than 6 months for employees whose exposures to asbestos may reasonably be foreseen to exceed the exposure limits prescribed in paragraph (b) of this section.

(4) *Employee observation of monitoring.* Affected employees, or their representatives, shall be given a reasonable opportunity to observe any monitoring required by this paragraph and shall have access to the records thereof.

(g) *Caution signs and labels.* (1) *Caution signs.* (i) *Posting.* Caution signs shall be provided and displayed at each location where airborne concentrations of asbestos fibers may be in excess of the exposure limits prescribed in paragraph (b) of this section. Signs shall be posted at such a distance from such a location so that an employee may read the signs and take necessary protective steps before entering the area marked by the signs. Signs shall be posted at all approaches to areas containing excessive concentrations of airborne asbestos fibers.

(ii) *Sign specifications.* The warning signs required by subdivision (i) of this subparagraph shall conform to the requirements of 20" x 14" vertical format signs specified in § 1910.145(d)(4), and to this subdivision. The signs shall display the following legend in the lower panel, with letter sizes and styles of a visibility at least equal to that specified in this subdivision.

1910.93 b Coal Tar volatiles
1910.93 c Carcinogens A

RULES AND REGULATIONS

Legend	Notation
Asbestos -----	1" Sans Serif, Gothic or Block.
Dust Hazard -----	3/4" Sans Serif, Gothic or Block.
Avoid Breathing Dust ---	1/4" Gothic.
Wear Assigned Protective Equipment.	1/4" Gothic.
Do Not Remain In Area Unless Your Work Requires It.	1/4" Gothic.
Breathing Asbestos Dust May Be Hazardous To Your Health.	14 point Gothic.

Spacing between lines shall be at least equal to the height of the upper of any two lines.

(2) **Caution labels**—(i) **Labeling**. Caution labels shall be affixed to all raw materials, mixtures, scrap, waste, debris, and other products containing asbestos fibers, or to their containers, except that no label is required where asbestos fibers have been modified by a bonding agent, coating, binder, or other material so that during any reasonably foreseeable use, handling, storage, disposal, processing, or transportation, no airborne concentrations of asbestos fibers in excess of the exposure limits prescribed in paragraph (b) of this section will be released.

(ii) **Label specifications**. The caution labels required by subdivision (i) of this subparagraph shall be printed in letters of sufficient size and contrast as to be readily visible and legible. The label shall state:

CAUTION
Contains Asbestos Fibers
Avoid Creating Dust
Breathing Asbestos Dust May Cause
Serious Bodily Harm

(h) **Housekeeping**—(1) **Cleaning**. All external surfaces in any place of employment shall be maintained free of accumulations of asbestos fibers if, with their dispersion, there would be an excessive concentration.

(2) **Waste disposal**. Asbestos waste, scrap, debris, bags, containers, equipment, and asbestos-contaminated clothing, consigned for disposal, which may produce in any reasonably foreseeable use, handling, storage, processing, disposal, or transportation airborne concentrations of asbestos fibers in excess of the exposure limits prescribed in paragraph (b) of this section shall be collected and disposed of in sealed impermeable bags, or other closed, impermeable containers.

(i) **Recordkeeping**—(1) **Exposure records**. Every employer shall maintain records of any personal or environmental monitoring required by this section. Records shall be maintained for a period of at least 3 years and shall be made available upon request to the Assistant Secretary of Labor for Occupational Safety and Health, the Director of the National Institute for Occupational Safety and Health, and to authorized representatives of either.

(2) **Employee access**. Every employee and former employee shall have reasonable access to any record required to be maintained by subparagraph (1) of this

paragraph, which indicates the employee's own exposure to asbestos fibers.

(3) **Employee notification**. Any employee found to have been exposed at any time to airborne concentrations of asbestos fibers in excess of the limits prescribed in paragraph (b) of this section shall be notified in writing of the exposure as soon as practicable but not later than 5 days of the finding. The employee shall also be timely notified of the corrective action being taken.

(j) **Medical examinations**—(1) **General**. The employer shall provide or make available at his cost, medical examinations relative to exposure to asbestos required by this paragraph.

(2) **Preplacement**. The employer shall provide or make available to each of his employees, within 30 calendar days following his first employment in an occupation exposed to airborne concentrations of asbestos fibers, a comprehensive medical examination, which shall include, as a minimum, a chest roentgenogram (posterior-anterior 14 x 17 inches), a history to elicit symptomatology of respiratory disease, and pulmonary function tests to include forced vital capacity (FVC) and forced expiratory volume at 1 second (FEV_{1.0}).

(3) **Annual examinations**. On or before January 31, 1973, and at least annually thereafter, every employer shall provide, or make available, comprehensive medical examinations to each of his employees engaged in occupations exposed to airborne concentrations of asbestos fibers. Such annual examination shall include, as a minimum, a chest roentgenogram (posterior-anterior 14 x 17 inches), a history to elicit symptomatology of respiratory disease, and pulmonary function tests to include forced vital capacity (FVC) and forced expiratory volume at 1 second (FEV_{1.0}).

(4) **Termination of employment**. The employer shall provide, or make available, within 30 calendar days before or after the termination of employment of any employee engaged in an occupation exposed to airborne concentrations of asbestos fibers, a comprehensive medical examination which shall include, as a minimum, a chest roentgenogram (posterior-anterior 14 x 17 inches), a history to elicit symptomatology of respiratory disease, and pulmonary function tests to include forced vital capacity (FVC) and forced expiratory volume at 1 second (FEV_{1.0}).

(5) **Recent examinations**. No medical examination is required of any employee, if adequate records show that the employee has been examined in accordance with this paragraph within the past 1-year period.

(6) **Medical records**—(i) **Maintenance**. Employers of employees examined pursuant to this paragraph shall cause to be maintained complete and accurate records of all such medical examinations. Records shall be retained by employers for at least 20 years.

(ii) **Access**. The contents of the records of the medical examinations required by this paragraph shall be made available, for inspection and copying,

to the Assistant Secretary of Labor for Occupational Safety and Health, the Director of NIOSH, to authorized physicians and medical consultants of either of them, and, upon the request of an employee or former employee, to his physician. Any physician who conducts a medical examination required by this paragraph shall furnish to the employer of the examined employee all the information specifically required by this paragraph, and any other medical information related to occupational exposure to asbestos fibers.

§ 1910.94 Ventilation.

(a) **Abrasive blasting**—(1) **Definitions applicable to this paragraph**—(i) **Abrasive**. A solid substance used in an abrasive blasting operation.

(ii) **Abrasive-blasting respirator**. A continuous flow air-line respirator constructed so that it will cover the wearer's head, neck, and shoulders to protect him from rebounding abrasive.

(iii) **Blast cleaning barrel**. A complete enclosure which rotates on an axis, or which has an internal moving tread to tumble the parts, in order to expose various surfaces of the parts to the action of an automatic blast spray.

(iv) **Blast cleaning room**. A complete enclosure in which blasting operations are performed and where the operator works inside of the room to operate the blasting nozzle and direct the flow of the abrasive material.

(v) **Blasting cabinet**. An enclosure where the operator stands outside and operates the blasting nozzle through an opening or openings in the enclosure.

(vi) **Clean air**. Air of such purity that it will not cause harm or discomfort to an individual if it is inhaled for extended periods of time.

(vii) **Dust collector**. A device or combination of devices for separating dust from the air handled by an exhaust ventilation system.

(viii) **Exhaust ventilation system**. A system for removing contaminated air from a space, comprising two or more of the following elements (a) enclosure or hood, (b) duct work, (c) dust collecting equipment, (d) exhaust, and (e) discharge stack.

(ix) **Particulate-filter respirator**. An air purifying respirator, commonly referred to as a dust or a fume respirator, which removes most of the dust or fume from the air passing through the device.

(x) **Respirable dust**. Airborne dust in sizes capable of passing through the upper respiratory system to reach the lower lung passages.

(xi) **Rotary blast cleaning table**. An enclosure where the pieces to be cleaned are positioned on a rotating table and are passed automatically through a series of blast sprays.

(xii) **Abrasive blasting**. The forcible application of an abrasive to a surface by pneumatic pressure, hydraulic pressure, or centrifugal force.

(2) **Dust hazards from abrasive blasting**. (i) Abrasives and the surface coatings on the materials blasted are shattered and pulverized during blasting

§ 1910.93c Carcinogens.

(a) **Scope and application.** This section applies to any workplace in which a carcinogen is manufactured, processed, used, repackaged, released, handled or stored, but shall not apply to any workplace involving transshipment of carcinogens in sealed containers.

(b) **Definitions.** (1) "Carcinogen" means any of the substances listed below, or any mixture containing 1 percent or more of such substances, by weight.

Compound No.	Chemicals	Chemical abstract registry No.
1.....	2-Acetylaminofluorene.....	59963
2.....	4-Aminodiphenyl.....	98671
3.....	Benzidine (and its salts).....	92875
4.....	3,3'-Dichlorobenzidine (and its salts).....	92941
5.....	Dimethylaminoazobenzene.....	60117
6.....	alpha-Naphthylamine.....	134327
7.....	beta-Naphthylamine.....	11596
8.....	4-Nitrobiphenyl.....	92933
9.....	N-Nitrosodimethylamine.....	92759
10.....	beta-Propiolactone.....	57578
11.....	bis-Chloromethyl ether.....	92381
12.....	Methyl Chloromethyl ether.....	92302
13.....	4,4'-Methylene(bis)2-chloroaniline.....	141144
14.....	Ethyleneimine.....	151564

(2) "Controlled area" means an area to which access or egress by employees is required to be restricted and controlled by the employer under this section.

(3) "Decontamination" means the removal or inactivation of a carcinogen.

(4) "Isolated environment" means a fully enclosed structure, which is impervious to the passage of a carcinogen, which is not the vessel of containment of the carcinogen, and which prevents the dispersion of a carcinogen into areas or atmospheres where employees would be exposed to contact with that carcinogen, even if leakage or spillage from the vessel of containment occurs.

(5) "Closed system" means an operation or equipment involving a carcinogen where the containment precludes, under normal conditions, the exposure by any route of employees to a carcinogen.

(6) "Laboratory type hood" means a device enclosed on three sides, and the top and bottom, ventilated to withdraw air inward and away from the open side, designed and constructed in such a way that an operation involving a carcinogen within the hood does not require the insertion of any portion of any employee's body other than his hands and arms.

(c) **Requirements for areas containing carcinogens.** A controlled area shall be established by the employer where a carcinogen is manufactured, processed, used, repackaged, released, handled or stored. All such areas shall be controlled in accordance with the requirements for the following category or categories describing the operation involved:

(1) **Isolated environment operations.** Where a carcinogen is contained within an isolated environment, such as a "glove box," employees working with such environments shall, upon each exit from

the area, be required to wash their hands and arms at the point of exit from the area containing the isolated environment.

(2) **Closed system operations.** Where a carcinogen is stored in sealed containers, or contained in a closed system, such as fully enclosed process or transfer equipment, including pipes, and sample ports or openings are not used while a carcinogen is contained within:

(i) Access to the controlled area shall be restricted to only employees who work in that area.

(ii) Upon entering the controlled area at the first entry of the work day employees shall be provided with and be required to put on and wear clean work clothing, such as smocks, coveralls, or long-sleeved shirt and long pants.

(iii) Such employees shall be required to remove and leave that clothing at the point of exit upon each exit from that area.

(iv) Such employees shall be required to wash hands and face upon each exit from that area, not necessarily at the point of exit, but in the establishment.

(v) Such employees shall be required to shower after last daily exit from that area, not necessarily at the point of exit, but in the establishment.

(3) **Closed system transfer or charging or discharging point operations.** In operations involving "laboratory type hoods," or in locations where a carcinogen is contained in an otherwise "closed system," but is transferred, charged, or discharged into other normally closed containers with venting to the atmosphere:

(i) Access to the controlled area shall be restricted to only employees who work in that area.

(ii) Continuous local exhaust ventilation shall be maintained to prevent the dispersion of the carcinogen to areas where employees could, without such ventilation, be exposed to the carcinogen.

(iii) Upon entering the controlled area at the first entry of the work day all employees shall be provided with and be required to put on and wear clean work clothing, such as smocks, coveralls or long-sleeved shirts and long pants.

(iv) Employees in the controlled area involved in carcinogen handling operations shall be provided with and be required to wear personal protective equipment adequate to prevent exposure to a carcinogen.

(v) Such employees shall be required to remove and leave that clothing at the point of exit upon each exit from that area.

(vi) Such employees shall be required to wash hands and face upon each exit from that area, not necessarily at the point of exit, but in the establishment.

(vii) Such employees shall be required to shower after last daily exit from that area, not necessarily at the point of exit,

(viii) Employees in the controlled area shall be required to remove and leave all protective equipment at the hood site or charging, discharging or transfer point after work at that site or point.

(4) **Open vessel operations.** Where a carcinogen is contained in a vessel open to the work environment:

(i) Access to the controlled area shall be restricted only to employees who work in the area.

(ii) Continuous local exhaust ventilation shall be maintained at such operation locations sufficient to prevent the dispersion of the carcinogen to areas where employees could, without such ventilation, be exposed to contact with the carcinogen.

(iii) Clean work clothing shall be provided to employees whenever they enter such a controlled area and shall be required to be worn by employees working in the controlled area. Such garments shall include footwear, socks, underwear, outerwear, and head covering.

(iv) Employees working in the controlled area shall be provided with and be required to wear personal protective equipment adequate to prevent exposure to a carcinogen.

(v) Employees working in the controlled area shall be required to remove and leave all work clothing and protective equipment at the point of exit from the controlled area, and shall shower at that point, upon each exit from the controlled area.

(vi) Toilet and drinking facilities may not be used in the controlled area.

(5) **Other Operations.** In operations involving the decontamination of surfaces containing a carcinogen, either as a part of cleanup of leaks or spills, maintenance or repair operations on systems or equipment, or any operation involving work in an area where direct contact with a carcinogen could result without protection, each employee entering an affected area where operations of that type are being performed shall:

(i) Be provided with a clean, full, impervious, pressurized, air-supplied suit;

(ii) Be required to put on the suit before entering the affected area and engaging in such operation;

(iii) Be required to wear the suit in such an area and during the operation;

(iv) Be decontaminated before leaving the area and before removing the suit; and

(v) Be required to shower after removing such suit.

(6) **"Out-of-doors operations."** In an operation described in paragraphs (c) (1) through (5) of this section that is out-of-doors, rather than being confined in an enclosed structure, general mechanical ventilation is not required.

(d) **General controlled area requirements.** In addition to the controlled area requirements for types of operations listed in paragraph (c) of this section the following requirements apply to all controlled areas.

(1) Each employer shall establish and maintain a list of employees entering a controlled area. The list shall be made available on request to authorized representatives of the Secretary of Labor.

(2) The employer shall provide all work clothing, protective clothing, equip-

RULES AND REGULATIONS

CANCER-SUSPECT AGENT

In this area

This agent may be hazardous to your health

AUTHORIZED PERSONNEL ONLY

For isolated environment operations, the sign shall be posted on or near the isolated environment structure.

(2) Equipment, material, and clothing contaminated with a carcinogen shall not be removed from a controlled area, unless it is either decontaminated or sealed in impervious containers bearing the legend:

DANGER

Contaminated with

CANCER-SUSPECT AGENT

This agent may be hazardous to your health

(3) Entrances to every controlled area for operations described in paragraph (c) (5) of this section shall be posted with legible signs bearing the legend:

CANCER-SUSPECT AGENT EXPOSED IN THIS AREA

This agent may be hazardous to your health
FULL IMPERVIOUS PRESSURIZED AIR-SUPPLIED SUIT REQUIRED AT ALL TIMES

AUTHORIZED PERSONNEL ONLY

(f) Cleaning. Controlled areas involving open vessel operations or other operations, as described in paragraph (c) (4) and (5) of this section, shall be cleaned thoroughly not less than once each working day. Employees engaged in the cleaning shall be provided, and shall be required to wear, personal protective equipment adequate to prevent exposure to a carcinogen. Such employees shall be required to wash down carefully before removing protective equipment, and then shower.

(g) Decontamination. Decontamination processes shall be established and implemented to remove carcinogens on surfaces of equipment, materials, and the decontamination facility, that are known to be contaminated with a carcinogen.

(h) Waste disposal. Waste disposal methods and processes shall be established and implemented which do not permit carcinogens to be introduced into noncontrolled areas.

(i) Medical surveillance programs. Each employer subject to this section shall report in writing to the Occupational Safety and Health Administration, Office of Standards, Room 504, 400 First Street, NW., Washington, D.C. 20210, information as to any kind of medical surveillance program that has been voluntarily instituted by the employer.

(j) Monitoring. All employers subject to this section shall report in writing to the same office information as to the type of monitoring system that has been instituted.

(k) Reporting. Every employer subject to this section shall report in writing to the Occupational Safety and Health Administration, Office of Standards, the following information:

(1) The address of each of his controlled areas;

(2) The name and other identifying information as to the particular carcinogens present in each of his controlled areas;

(3) The approximate number of employees entering each of his controlled areas during a representative week of normal operations in the controlled area; and

(4) The manner in which the carcinogens are present in each of his controlled areas, e.g., whether a carcinogen is manufactured, processed, used, repackaged, released, or otherwise handled.

Effective date. This section shall become effective on July 30, 1973.

§ 1910.94 Ventilation.

(a) Abrasive blasting—(1) Definitions applicable to this paragraph—(i) Abrasive. A solid substance used in an abrasive blasting operation.

(ii) Abrasive-blasting respirator. A continuous flow air-line respirator constructed so that it will cover the wearer's head, neck, and shoulders to protect him from rebounding abrasive.

(iii) Blast cleaning barrel. A complete enclosure which rotates on an axis, or which has an internal moving tread to tumble the parts, in order to expose various surfaces of the parts to the action of an automatic blast spray.

(iv) Blast cleaning room. A complete enclosure in which blasting operations are performed and where the operator works inside of the room to operate the blasting nozzle and direct the flow of the abrasive material.

(v) Blasting cabinet. An enclosure where the operator stands outside and operates the blasting nozzle through an opening or openings in the enclosure.

(vi) Clean air. Air of such purity that it will not cause harm or discomfort to an individual if it is inhaled for extended periods of time.

(vii) Dust collector. A device or combination of devices for separating dust from the air handled by an exhaust ventilation system.

(viii) Exhaust ventilation system. A system for removing contaminated air from a space, comprising two or more of the following elements (a) enclosure or hood, (b) duct work, (c) dust collecting equipment, (d) exhaust, and (e) discharge stack.

(ix) Particulate-filter respirator. An air purifying respirator, commonly referred to as a dust or a fume respirator, which removes most of the dust or fume from the air passing through the device.

(x) Respirable dust. Airborne dust in sizes capable of passing through the upper respiratory system to reach the lower lung passages.

(xi) Rotary blast cleaning table. An enclosure where the pieces to be cleaned are positioned on a rotating table and are passed automatically through a series of blast sprays.

(xii) Abrasive blasting. The forcible application of an abrasive to a surface by pneumatic pressure, hydraulic pressure, or centrifugal force.

(2) Dust hazards from abrasive blasting. (i) Abrasives and the surface coatings on the materials blasted are shattered and pulverized during blasting

ment and wash and shower supplies, including towels, required by this section.

(3) Any required shower rooms shall be provided in accordance with § 1910.141. Shower supplies may be introduced into a shower room only through a noncontaminated area.

(4) No food or beverage shall be permitted within a controlled area.

(5) No smoking or smoking materials or tobacco products shall be allowed within a controlled area.

(6) Appropriate instructions and signs shall be posted to inform employees of the procedures that must be followed in entering and leaving a controlled area.

(7) Any equipment, material, or any other items that are to be taken into or removed from a controlled area shall be taken in or removed from such area in a manner which does not contaminate any employees outside the controlled area.

(8) When only removal of outer clothing or personal protective equipment is required under paragraph (c) of this section at point of exit from a controlled area, an employee must be able, upon exit from the controlled area, to enter the change room, remove outer work garments and equipment and leave them in that room.

(9) When change and shower facilities are required under paragraph (c) of this section at point of exit from a controlled area, they shall be arranged so that upon exit, an employee must be able to enter a separate dirty change room where he can undress completely and leave every item of clothing and equipment. He must then be able to shower in an adjacent room which he can enter through an entrance designed to prevent the escape of carcinogens from the dirty change room to the shower room. Thereafter, he must be able to enter a clean change room where his street clothes are in his locker.

(10) When work area garments or protective clothing and equipment are required under paragraph (c) of this section to be worn in a controlled area, a clean change room must be provided so that before entering the controlled area the employee can change into clean work area garments or protective clothing and equipment in an area not containing contaminated or used work clothing or equipment and without passing through such a contaminated area to enter the controlled area. The clean change room shall have individual storage facilities for storage of street clothes and clean protective clothing and equipment.

(11) Continuous general mechanical exhaust ventilation shall be provided in controlled areas, or other positive means provided, so that air from the controlled area does not flow to non-controlled areas. Local exhaust ventilation may satisfy this requirement. Clean makeup air shall replace air removed.

(e) Signs and labels. (1) Entrances to controlled areas shall be posted with legible signs bearing the legend:

§ 1910.133 Occupational head protection.

Helmets for the protection of heads of occupational workers from impact and penetration from falling and flying objects and from limited electric shock and burn shall meet the requirements and specifications established in American National Standard Safety Requirements for Industrial Head Protection, Z89.1-1969.

§ 1910.136 Occupational foot protection.

Safety-toe footwear for employees shall meet the requirements and specifications in American National Standard for Men's Safety-Toe Footwear, Z41.1-1967.

§ 1910.137 Electrical protective devices.

Rubber protective equipment for electrical workers shall conform to the requirements established in the American National Standards Institute Standards as specified in the following list:

Item	Standard
Rubber insulating gloves.	J6.8-1967.
Rubber matting for use around electric apparatus.	J6.7-1935 (R1962).
Rubber insulating blankets.	J6.4-1970.
Rubber insulating hoods.	J6.2-1950 (R1962).
Rubber insulating line hose.	J6.1-1950 (R1962).
Rubber insulating sleeves.	J6.5-1962.

§ 1910.138 Effective dates.

(a) The provisions of this Subpart I shall become effective on August 27, 1971, except that:

(1) Any provision in any other section of this subpart which contains in itself a specific effective date or time limitation shall become effective on such date or shall apply in accordance with such limitation; and

(2) If any standard in 41 CFR Part 50-204, other than a national consensus standard incorporated by reference in § 50-204.2(a)(1), is or becomes applicable at any time to any employment and place of employment, by virtue of the Walsh-Healey Public Contracts Act, or the Service Contract Act of 1965, or the National Foundation on Arts and Humanities Act of 1965, any corresponding established Federal standard in this Subpart I which is derived from 41 CFR Part 50-204 shall also become effective, and shall be applicable to such employment and place of employment, on the same date.

§ 1910.139 Sources of standards.

Sec.	Source
1910.132	41 CFR 50-204.7.
1910.133(a)	ANSI Z87.1-1968, Eye and Face Protection.
1910.134	ANSI Z89.2-1969, Standard Practice for Respiratory Protection.
1910.134 Table I-I.	ANSI K13.1-1967, Identification of Gas Mask Canister.
1910.135	ANSI Z89.1-1969, Safety Requirements for Industrial Head Protection.

Sec.	Source
1910.133	ANSI Z41.1-1967, Men's Safety-Toe Footwear.
1910.137	ANSI Z44-1959, Ventilation and Safe Practices of Abrasive Blasting Operations.

§ 1910.140 Standards organizations.

Specific standards of the following organization have been referenced in this part. Copies of the referenced materials may be obtained from the issuing organization.

American National Standards Institute, 1430 Broadway, New York, NY 10018.

Subpart J—General Environmental Controls

§ 1910.141 Sanitation.

(a) *General requirements*—(1) *Housekeeping*. (i) All places of employment, passageways, storerooms, and service-rooms shall be kept clean and orderly and in a sanitary condition.

(ii) The floor of every workroom shall be maintained in a clean and, so far as possible, a dry condition. Where wet processes are used, drainage shall be maintained and false floors, platforms, mats, or other dry standing places should be provided where practicable.

(iii) Cleaning and sweeping shall be done in such a manner as to minimize the contamination of the air with dust and, so far as is practicable, shall be done outside of working hours.

(iv) To facilitate cleaning, every floor, working place, and passageway shall be kept free from protruding nails, splinters, holes, or loose boards.

(2) *Expectorating*. (i) Expectorating upon the walls, floors, work places, or stairs of any establishment shall not be permitted.

(ii) Cuspidors are considered undesirable, but, if used, they shall be of such construction that they are cleanable. They shall be cleaned at least daily when in use.

(3) *Waste disposal*. (i) Any receptacle used for putrescible solid or liquid waste or refuse shall be so constructed that it does not leak and may be conveniently and thoroughly cleaned, and it shall be maintained in a sanitary condition. Such a receptacle shall be equipped with a tight-fitting cover.

(ii) All sweepings, solid or liquid wastes, refuse, and garbage shall be removed in such a manner as to avoid creating a nuisance or menace to health and as often as necessary to maintain the place of employment in a sanitary condition.

(4) *Rodent, insect, and vermin control*. Every enclosed work place and personal service room shall be constructed, equipped, and maintained, so far as reasonably practicable, in such a manner as to prevent the entrance or harborage of rodents, insects, and vermin of any kind.

(b) *Water supply*—(1) *Potable water*. (i) An adequate supply of potable water shall be provided for drinking, ablutionary, and culinary purposes in all places of employment. Drinking water should be made available within 200 feet of any

location at which employees are regularly engaged in work.

(ii) Sanitary drinking fountains shall be of a type and construction in accordance with the Standard Specification for Drinking Fountains, ANSI Z42-1942.

(iii) In all instances where water is cooled by ice, the construction of the container shall be such that the ice does not come in direct contact with the water.

(iv) Open containers such as barrels, pails, or tanks for drinking water from which the water must be dipped or poured, whether or not they are fitted with a cover, are prohibited.

(v) The common drinking cup is prohibited.

(vi) Where single service cups (to be used but once) are supplied, both a sanitary container for the unused cups and a receptacle for disposing of the used cups shall be provided.

(2) *Nonpotable water*. (i) Outlets for nonpotable water, such as water for industrial or firefighting purposes only, shall be posted to indicate clearly that the water is unsafe and is not to be used for drinking, washing, or cooking purposes.

(ii) There shall be no cross-connection, open or potential, between a system furnishing potable water and system furnishing nonpotable water.

(iii) Construction shall be such as to prevent backflow of contaminated water into a potable water system.

(iv) Nonpotable water shall not be used for bathing or for washing any portion of the person, clothing, dishes, or premises.

(c) *Toilet facilities*—(1) *General*. (i) Every place of employment shall be provided with adequate toilet facilities which are separate for each sex. The sewage disposal method shall comply with requirements of the health or other authorities having jurisdiction.

(ii) Toilet facilities shall be provided so as to be readily accessible to all employees. Toilet facilities so located that employees must use more than one floor-to-floor flight of stairs to or from them are not considered as readily accessible. As far as is practicable, toilet facilities should be located within 200 feet of all locations at which workers are regularly employed.

(iii) Water closets shall be provided for each sex according to the following table. The number to be provided for each sex shall in every case be based on the maximum number of persons of that sex employed at any one time at work on the premises for which the facilities are furnished. When persons other than employees are permitted the use of toilet facilities on the premises, a reasonable allowance shall be made for such other persons in estimating the minimum number of toilet facilities required.

Number of persons	Minimum number of facilities
1 to 9	1
10 to 24	2
25 to 49	3
50 to 74	4
75 to 100	5
over 100	1 for each additional 30 persons.

where 10 or more are employed, urinals may be provided. One water closet less than the number specified in the foregoing may be provided for each urinal, except that the number of water closets in such cases may not be reduced to less than two-thirds of the number specified in the foregoing. Two feet of trough urinal shall be considered as equivalent to one individual urinal.

(iv) An adequate supply of toilet paper with holder shall be provided for every water closet.

(v) Covered receptacles shall be kept in all toilet rooms used by women.

(vi) Adequate washing facilities shall be provided in every toilet room or be adjacent thereto.

(2) *Construction of toilet rooms.* (i) Each toilet facility (closet) shall occupy a separate compartment, which should be equipped with a door, latch, and clothes hanger.

(ii) The walls of compartments or partitions between fixtures may be less than the height of room walls, but the top shall be sufficiently high to assure privacy.

(iii) The door to every toilet room shall be fitted with an effective self-closing device, and the entrance to the toilet room shall be so screened that the interior of the toilet room is not visible from the workroom.

(iv) In all toilet rooms installed on or after August 31, 1971, the floors and side walls, to a height of at least 6 inches, including the angle formed by the floor and side walls, shall be of watertight construction.

(v) The floors, walls, ceilings, partitions, and doors of all toilet rooms shall be of a finish that can be easily cleaned. In installations made on or after August 31, 1971, cove bases shall be provided to facilitate cleaning.

(vi) Toilet rooms, except those in work places accessible to men only, shall be completely enclosed with solid material that is nontransparent from the outside.

(3) *Construction and installation of toilet facilities.* (i) Every water closet bowl shall be set entirely free and open from all enclosing structures and shall be so installed that the space around the fixture can be easily cleaned. This provision does not prohibit the use of wall-hung type water closets.

(ii) Every water closet shall have a hinged openfront seat made of substantial material having a nonabsorbent finish.

(4) *Chemical closets and privies.* Chemical closets and privies shall be constructed and maintained in accordance with § 1910.143.

(d) *Washing facilities.*—(1) *General.* Adequate facilities for maintaining personal cleanliness shall be provided in every place of employment. These shall be convenient for the employees for whom they are provided and shall be maintained in a sanitary condition.

(2) *Lavatories.* At least one lavatory with adequate hot and cold water, preferably from a combination supply fixture, shall be provided for every 25 employees (men or women) or portion thereof up to 100 persons; and one for each

lavatory for each additional 15 persons or portion thereof. Twenty-four inches of sink with individual faucet shall be considered as equal to one lavatory. In all instances, a suitable cleansing agent shall be provided at each wash place.

(3) *Towels.* Individual hand towels, or sections thereof, of cloth or paper, shall be provided and proper receptacles or other sanitary means maintained for the disposal of used towels. The provision of a towel for general or common use is prohibited.

—(c) *Change rooms.*—(1) *Separate facilities.* Separate change or dressing rooms equipped with individual clothes facilities shall be provided for each sex wherever it is the practice to change from street clothes or wherever it is necessary to change because the work performed involves exposure to excessive dirt, heat, fumes, vapor, or moisture. In the event that change rooms are not provided, facilities shall be furnished for hanging outer garments.

(2) *Drying facilities.* Where the process in which the worker is engaged is such that his working clothes become wet or have to be washed between shifts, provision shall be made to insure that such clothing is dry before reuse.

—(f) *Retiring rooms for women.* Where 10 or more women are employed at any one time, at least one retiring room shall be provided for rest and emergencies. Where fewer than 10 women are employed and a restroom is not furnished, some equivalent space shall be provided which can be properly screened for privacy and made suitable for the use of women employees. At least one couch or bed shall be provided in every place where more than 10 women are employed. The required number of such beds or couches follows:

10 to 100.....	1 bed
100 to 250.....	2 beds

1 additional bed for each additional 250 women employees. A minimum of 60 square feet of floor space per bed or couch shall be provided.

—(g) *Lunchrooms.*—(1) *General.* In all places of employment where employees are permitted to lunch on the premises, an adequate space suitable for that purpose shall be provided for the maximum number of employees who may use such space at one time. Such space shall be physically separate from any location where there is exposure to toxic materials.

(2) *Waste disposal containers.* An adequate number of covered receptacles constructed of a smooth, corrosion-resistant, easily cleanable, or disposable material, shall be provided by the employer and used by the employees for the disposal of all waste food. Such receptacles shall be emptied not less than once daily and shall be maintained in a clean and sanitary manner.

(3) *Location.* (i) No food shall be stored or eaten where there are present any toxic materials or substances that may be injurious to health.

(ii) No food shall be stored or eaten in any toilet room.

(iii) In every establishment where there is exposure to injurious dusts or

other toxic materials, a separate lunchroom shall be maintained unless it is convenient for the employees to lunch away from the premises. The following number of square feet per person, based on the maximum number of persons using the room at one time, shall be required:

Number of persons	Square feet per person
25 and less.....	13
26-74.....	12
75-149.....	11
150 and over.....	10

—(h) *Food handling.* All employee food service facilities and operations shall meet the requirements of "Food Service Sanitation Ordinance and Code," Part V, "Food Service Sanitation Manual," U.S. Public Health Service Publication No. 934 (1965). In all places of employment where all or part of the food service is provided by vending machines, the food dispensed shall be prepared, and the machine operated in accordance with the requirements of "Vending of Foods and Beverages, A Sanitation Ordinance and Code," U.S. Public Health Service Publication No. 546 (1965).

(i) *Scope.* This section applies to all permanent places of employment except where domestic, mining, or agricultural work only is performed. Measures for the control of toxic materials are considered to be outside the scope of this section.

§ 1910.142 Temporary labor camps.

(a) *Site.* (1) All sites used for camps shall be adequately drained. They shall not be subject to periodic flooding, nor located within 200 feet of swamps, pools, sink holes, or other surface collections of water unless such quiescent water surfaces can be subjected to mosquito control measures. The camp shall be located so the drainage from and through the camp will not endanger any domestic or public water supply. All sites shall be graded, ditched, and rendered free from depressions in which water may become a nuisance.

(2) All sites shall be adequate in size to prevent overcrowding of necessary structures. The principal camp area in which food is prepared and served and where sleeping quarters are located shall be at least 500 feet from any area in which livestock is kept.

(3) The grounds and open areas surrounding the shelters shall be maintained in a clean and sanitary condition free from rubbish, debris, waste paper, garbage, or other refuse.

(4) Whenever the camp is closed for the season or permanently, all garbage, manure, and other refuse shall be collected and so disposed of as to prevent nuisance. All abandoned privy pits shall be filled with earth and the grounds and buildings left in a clean and sanitary condition. If privy buildings remain, they shall be locked or otherwise secured to prevent entrance.

(b) *Shelter.* (1) Every shelter in the camp shall be constructed in a manner which will provide protection against the elements.

(2) Each room used for sleeping purposes shall contain at least 50 square feet