

### § 1926.53

$F_c = 0.938$

Since the value of  $F_c$  does not exceed unity, the exposure is within permissible limits.

(e) Exposure to impulsive or impact noise should not exceed 140 dB peak sound pressure level.

### § 1926.53 Ionizing radiation.

(a) In construction and related activities involving the use of sources of ionizing radiation, the pertinent provisions of the Nuclear Regulatory Commission's Standards for Protection Against Radiation (10 CFR part 20), relating to protection against occupational radiation exposure, shall apply.

(b) Any activity which involves the use of radioactive materials or X-rays, whether or not under license from the Nuclear Regulatory Commission, shall be performed by competent persons specially trained in the proper and safe operation of such equipment. In the case of materials used under Commission license, only persons actually licensed, or competent persons under direction and supervision of the licensee, shall perform such work.

(c)–(r) [Reserved]

NOTE: The requirements applicable to construction work under paragraphs (c) through (r) of this section are identical to those set forth at paragraphs (a) through (p) of § 1910.1096 of this chapter.

[44 FR 8577, Feb. 9, 1979; 44 FR 20940, Apr. 6, 1979, as amended at 61 FR 5510, Feb. 13, 1996; 61 FR 31431, June 20, 1996]

### § 1926.54 Nonionizing radiation.

(a) Only qualified and trained employees shall be assigned to install, adjust, and operate laser equipment.

(b) Proof of qualification of the laser equipment operator shall be available and in possession of the operator at all times.

(c) Employees, when working in areas in which a potential exposure to direct or reflected laser light greater than 0.005 watts (5 milliwatts) exists, shall be provided with antilaser eye protection devices as specified in subpart E of this part.

(d) Areas in which lasers are used shall be posted with standard laser warning placards.

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(e) Beam shutters or caps shall be utilized, or the laser turned off, when laser transmission is not actually required. When the laser is left unattended for a substantial period of time, such as during lunch hour, overnight, or at change of shifts, the laser shall be turned off.

(f) Only mechanical or electronic means shall be used as a detector for guiding the internal alignment of the laser.

(g) The laser beam shall not be directed at employees.

(h) When it is raining or snowing, or when there is dust or fog in the air, the operation of laser systems shall be prohibited where practicable; in any event, employees shall be kept out of range of the area of source and target during such weather conditions.

(i) Laser equipment shall bear a label to indicate maximum output.

(j) Employees shall not be exposed to light intensities above:

(1) Direct staring: 1 micro-watt per square centimeter;

(2) Incidental observing: 1 milliwatt per square centimeter;

(3) Diffused reflected light: 2½ watts per square centimeter.

(k) Laser unit in operation should be set up above the heads of the employees, when possible.

(l) Employees shall not be exposed to microwave power densities in excess of 10 milliwatts per square centimeter.

### § 1926.55 Gases, vapors, fumes, dusts, and mists.

(a) Exposure of employees to inhalation, ingestion, skin absorption, or contact with any material or substance at a concentration above those specified in the "Threshold Limit Values of Airborne Contaminants for 1970" of the American Conference of Governmental Industrial Hygienists, shall be avoided. See Appendix A to this section.

(b) To achieve compliance with paragraph (a) of this section, administrative or engineering controls must first be implemented whenever feasible. When such controls are not feasible to achieve full compliance, protective equipment or other protective measures shall be used to keep the exposure of employees to air contaminants within the limits prescribed in this section.

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Any equipment and technical measures used for this purpose must first 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 § 1926.103.

(c) Paragraphs (a) and (b) of this section do not apply to the exposure of employees to airborne asbestos, tremolite, anthophyllite, or actinolite

dust. Whenever any employee is exposed to airborne asbestos, tremolite, anthophyllite, or actinolite dust, the requirements of § 1910.1101 or § 1926.58 of this title shall apply.

(d) Paragraphs (a) and (b) of this section do not apply to the exposure of employees to formaldehyde. Whenever any employee is exposed to formaldehyde, the requirements of § 1910.1048 of this title shall apply.

APPENDIX A TO § 1926.55—1970 AMERICAN CONFERENCE OF GOVERNMENTAL INDUSTRIAL HYGIENISTS' THRESHOLD LIMIT VALUES OF AIRBORNE CONTAMINANTS

THRESHOLD LIMIT VALUES OF AIRBORNE CONTAMINANTS FOR CONSTRUCTION

Substance	CAS No. <sup>d</sup>	ppm <sup>a</sup>	mg/m <sup>3,b</sup>	Skin Designation
Abate; see Temephos.				
Acetaldehyde .....	75-07-0	200	360	—
Acetic acid .....	64-19-7	10	25	—
Acetic anhydride .....	108-24-7	5	20	—
Acetone .....	67-64-1	1000	2400	—
Acetonitrile .....	75-05-8	40	70	—
2-Acetylaminofluorine; see § 1926.1114	53-96-3			
Acetylene .....	74-86-2	E		
Acetylene dichloride; see 1,2-Dichloroethylene.				
Acetylene tetrabromide .....	79-27-6	1	14	—
Acrolein .....	107-02-8	0.1	0.25	—
Acrylamide .....	79-06-1	—	0.3	X
Acrylonitrile; see § 1926.1145 .....	107-13-1			
Aldrin .....	309-00-2	—	0.25	X
Allyl alcohol .....	107-18-6	2	5	X
Allyl chloride .....	107-05-1	1	3	—
Allyl glycidyl ether (AGE) .....	106-92-3	(C)10	(C)45	—
Allyl propyl disulfide .....	2179-59-1	2	12	—
alpha-Alumina .....	1344-28-1			
Total dust .....		—		—
Respirable fraction .....		—		—
Alundum; see alpha-Alumina.				
4-Aminodiphenyl; see § 1926.1111 .....	92-67-1			
2-Aminoethanol; see Ethanolamine.				
2-Aminopyridine .....	504-29-0	0.5	2	—
Ammonia .....	7664-41-7	50	35	—
Ammonium sulfamate .....	7773-06-0			
Total dust .....		—	15	—
Respirable fraction .....		—	5	—
n-Amyl acetate .....	628-63-7	100	525	—
sec-Amyl acetate .....	626-38-0	125	650	—
Aniline and homologs .....	62-53-3	5	19	X
Anisidine (o-, p-isomers) .....	29191-52-4	—	0.5	X
Antimony and compounds (as Sb) .....	7440-36-0	—	0.5	—
ANTU (alpha Naphthylthiourea) .....	86-88-4	—	0.3	—
Argon .....	7440-37-1	E		
Arsenic, inorganic compounds (as As); see § 1926.1118 .....	7440-38-2	—	—	—
Arsenic, organic compounds (as As) .....	7440-38-2	—	0.5	—
Arsine .....	7784-42-1	0.05	0.2	—
Asbestos; see 1926.58.				
Azinphos-methyl .....	86-50-0	—	0.2	X
Barium, soluble compounds (as Ba) .....	7440-39-3	—	0.5	—

THRESHOLD LIMIT VALUES OF AIRBORNE CONTAMINANTS FOR CONSTRUCTION—Continued

Substance	CAS No. <sup>d</sup>	ppm <sup>a</sup>	mg/m <sup>3,b</sup>	Skin Designation
Benzene <sup>9</sup> ; see § 1926.1128 .....	71-43-2			
Benzidine; see § 1926.1110 .....	92-87-5			
p-Benzoquinone; see Quinone.				
Benzo(a)pyrene; see Coal tar pitch volatiles.				
Benzoyl peroxide .....	94-36-0	—	5	—
Benzyl chloride .....	100-44-7	1	5	—
Beryllium and beryllium compounds (as Be) .....	7440-41-7	—	0.002	—
Biphenyl; see Diphenyl.				
Bisphenol A; see Diglycidyl ether.				
Boron oxide .....	1303-86-2			
Total dust .....		—	15	—
Boron tribromide .....	10294-33-4	1	10	—
Boron trifluoride .....	7637-07-2	(C)1	(C)3	—
Bromine .....	7726-95-6	0.1	0.7	—
Bromine pentafluoride .....	7789-30-2	0.1	0.7	—
Bromoform .....	75-25-2	0.5	5	X
Butadiene (1,3-Butadiene); see 29 CFR 1910.1051; 29 CFR 1910.19(l) .....	106-99-0	STEL 1 ppm/5 ppm	.....	—
Butanethiol; see Butyl mercaptan.				
2-Butanone (Methyl ethyl ketone) .....	78-93-3	200	590	—
2-Butoxyethanol .....	111-76-2	50	240	X
n-Butyl-acetate .....	123-86-4	150	710	—
sec-Butyl acetate .....	105-46-4	200	950	—
tert-Butyl acetate .....	540-88-5	200	950	—
n-Butyl alcohol .....	71-36-3	100	300	—
sec-Butyl alcohol .....	78-92-2	150	450	—
tert-Butyl alcohol .....	75-65-0	100	300	—
Butylamine .....	109-73-9	(C)5	(C)15	X
tert-Butyl chromate (as CrO <sub>3</sub> ); see 1926.1126 <sup>n</sup> .....	1189-85-1			
n-Butyl glycidyl ether (BGE) .....	2426-08-6	50	270	—
Butyl mercaptan .....	109-79-5	0.5	1.5	—
p-tert-Butyltoluene .....	98-51-1	10	60	—
Cadmium (as Cd); see 1926.1127 .....	7440-43-9			
Calcium carbonate .....	1317-65-3			
Total dust .....		—		—
Respirable fraction .....		—		—
Calcium oxide .....	1305-78-8	—	5	—
Calcium sulfate .....	7778-18-9			
Total dust .....		—	15	—
Respirable fraction .....		—	5	—
Camphor, synthetic .....	76-22-2	—	2	—
Carbaryl (Sevin) .....	63-25-2	—	5	—
Carbon black .....	1333-86-4	—	3.5	—
Carbon dioxide .....	124-38-9	5000	9000	—
Carbon disulfide .....	75-15-0	20	60	X
Carbon monoxide .....	630-08-0	50	55	—
Carbon tetrachloride .....	56-23-5	10	65	X
Cellulose .....	9004-34-6			
Total dust .....		—		—
Respirable fraction .....		—		—
Chlordane .....	57-74-9	—	0.5	X
Chlorinated camphene .....	8001-35-2	—	0.5	X
Chlorinated diphenyl oxide .....	55720-99-5	—	0.5	—
Chlorine .....	7782-50-5	1	3	—
Chlorine dioxide .....	10049-04-4	0.1	0.3	—
Chlorine trifluoride .....	7790-91-2	(C)0.1	(C)0.4	—
Chloroacetaldehyde .....	107-20-0	(C)1	(C)3	—

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Substance	CAS No. <sup>d</sup>	ppm <sup>a</sup>	mg/m <sup>3,b</sup>	Skin Designation
a-Chloroacetophenone (Phenacyl chloride) .....	532-27-4	0.05	0.3	—
Chlorobenzene .....	108-90-7	75	350	—
o-Chlorobenzylidene malononitrile .....	2698-41-1	0.05	0.4	—
Chlorobromomethane .....	74-97-5	200	1050	—
2-Chloro-1,3-butadiene; see beta-Chloroprene.				
Chlorodiphenyl (42% Chlorine) (PCB) ..	53469-21-9	—	1	X
Chlorodiphenyl (54% Chlorine) (PCB) ..	11097-69-1	—	0.5	X
1-Chloro-2,3-epoxypropane; see Epichlorohydrin.				
2-Chloroethanol; see Ethylene chlorohydrin.				
Chloroethylene; see Vinyl chloride.				
Chloroform (Trichloromethane) .....	67-66-3	(C)50	(C)240	—
bis(Chloromethyl) ether; see § 1926.1108 .....	542-88-1			
Chloromethyl methyl ether; see § 1926.1106 .....	107-30-2			
1-Chloro-1-nitropropane .....	600-25-9	20	100	—
Chloropicrin .....	76-06-2	0.1	0.7	—
beta-Chloroprene .....	126-99-8	25	90	X
Chromium (II) compounds.				
(as Cr) .....	7440-47-3	—	0.5	—
Chromium (III) compounds.				
(as Cr) .....	7440-47-3	—	0.5	—
Chromium (VI) compounds; See 1926.1126 °.				
Chromium metal and insol. salts (as Cr) .....	7440-47-3	—	1	—
Chrysene; see Coal tar pitch volatiles.				
Coal tar pitch volatiles (benzene soluble fraction), anthracene, BaP, phenanthrene, acridine, chrysene, pyrene ..	65996-93-2	—	0.2	—
Cobalt metal, dust, and fume (as Co) ..	7440-48-4	—	0.1	—
Coke oven emissions; see § 1926.1129.				
Copper .....	7440-50-8			
Fume (as Cu) .....		—	0.1	—
Dusts and mists (as Cu) .....		—	1	—
Corundum; see Emery.				
Cotton dust (raw) .....		—	1	—
Crag herbicide (Sesone) .....	136-78-7			
Total dust .....		—		—
Respirable fraction .....		—		—
Cresol, all isomers .....	1319-77-3	5	22	X
Crotonaldehyde .....	123-73-9;	2	6	
	4170-30-3			
Cumene .....	98-82-8	50	245	X
Cyanides (as CN) .....	Varies with Compound	—	5	X
Cyanogen .....	460-19-5	10	—	—
Cyclohexane .....	110-82-7	300	1050	—
Cyclohexanol .....	108-93-0	50	200	—
Cyclohexanone .....	108-94-1	50	200	—
Cyclohexene .....	110-83-8	300	1015	—
Cyclonite .....	121-82-4	—	1.5	X
Cyclopentadiene .....	542-92-7	75	200	—
DDT, see Dichlorodiphenyltrichloroethane.				
DDVP, see Dichlorvos.				
2,4-D (Dichlorophenoxyacetic acid) .....	94-75-7	—	10	—
Decaborane .....	17702-41-9	0.05	0.3	X

## THRESHOLD LIMIT VALUES OF AIRBORNE CONTAMINANTS FOR CONSTRUCTION—Continued

Substance	CAS No. <sup>d</sup>	ppm <sup>a</sup>	mg/m <sup>3,b</sup>	Skin Designation
Demeton (Systox) .....	8065-48-3	—	0.1	X
Diacetone alcohol (4-Hydroxy-4-methyl-2-pentanone) .....	123-42-2	50	240	—
1,2-Diaminoethane; see Ethylenediamine.				
Diazomethane .....	334-88-3	0.2	0.4	—
Diborane .....	19287-45-7	0.1	0.1	—
1,2-Dibromo-3-chloropropane (DBCP); see § 1926.1144 .....	96-12-8			—
1,2-Dibromoethane; see Ethylene dibromide.				
Dibutyl phosphate .....	107-66-4	1	5	—
Dibutyl phthalate .....	84-74-2	—	5	—
Dichloroacetylene .....	7572-29-4	(C)0.1	(C)0.4	—
o-Dichlorobenzene .....	95-50-1	(C)50	(C)300	—
p-Dichlorobenzene .....	106-46-7	75	450	—
3,3'-Dichlorobenzidine; see § 1926.1107 .....	91-94-1			
Dichlorodifluoromethane .....	75-71-8	1000	4950	—
1,3-Dichloro-5,5-dimethyl hydantoin .....	118-52-5	—	0.2	—
Dichlorodiphenyltrichloroethane (DDT) .....	50-29-3	—	1	X
1,1-Dichloroethane .....	75-34-3	100	400	—
1,2-Dichloroethane; see Ethylene dichloride.				
1,2-Dichloroethylene .....	540-59-0	200	790	—
Dichloroethyl ether .....	111-44-4	(C)15	(C)90	X
Dichloromethane; see Methylene chloride.				
Dichloromonofluoromethane .....	75-43-4	1000	4200	—
1,1-Dichloro-1-nitroethane .....	594-72-9	(C)10	(C)60	—
1,2-Dichloropropane; see Propylene dichloride.				
Dichlorotetrafluoroethane .....	76-14-2	1000	7000	—
Dichlorvos (DDVP) .....	62-73-7	—	1	X
Dieldrin .....	60-57-1	—	0.25	X
Diethylamine .....	109-89-7	25	75	—
2-Diethylaminoethanol .....	100-37-8	10	50	X
Diethylene triamine .....	111-40-0	(C)10	(C)42	X
Diethyl ether; see Ethyl ether.				
Difluorodibromomethane .....	75-61-6	100	860	—
Diglycidyl ether (DGE) .....	2238-07-5	(C)0.5	(C)2.8	—
Dihydroxybenzene; see Hydroquinone.				
Diisobutyl ketone .....	108-83-8	50	290	—
Diisopropylamine .....	108-18-9	5	20	X
4-Dimethylaminoazobenzene; see § 1926.1115 .....	60-11-7			
Dimethoxymethane; see Methylal.				
Dimethyl acetamide .....	127-19-5	10	35	X
Dimethylamine .....	124-40-3	10	18	—
Dimethylaminobenzene; see Xylidine.				
Dimethylaniline (N,N-Dimethylaniline) ...	121-69-7	5	25	X
Dimethylbenzene; see Xylene.				
Dimethyl-1,2-dibromo-2,2-dichloroethyl phosphate .....	300-76-5	—	3	—
Dimethylformamide .....	68-12-2	10	30	X
2,6-Dimethyl-4-heptanone; see Diisobutyl ketone.				
1,1-Dimethylhydrazine .....	57-14-7	0.5	1	X
Dimethylphthalate .....	131-11-3	—	5	—
Dimethyl sulfate .....	77-78-3	1	5	X
Dinitrobenzene (all isomers) .....			1	X
(ortho) .....	528-29-0			

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Substance	CAS No. <sup>d</sup>	ppm <sup>a</sup>	mg/m <sup>3,b</sup>	Skin Designation
(meta) .....	99-65-0			
(para) .....	100-25-4			
Dinitro-o-cresol .....	534-52-1	—	0.2	X
Dinitrotoluene .....	25321-14-6	—	1.5	X
Dioxane (Diethylene dioxide) .....	123-91-1	100	360	X
Diphenyl (Biphenyl) .....	92-52-4	0.2	1	—
Diphenylamine .....	122-39-4	—	10	—
Diphenylmethane diisocyanate; see Methylene bisphenyl isocyanate.				
Dipropylene glycol methyl ether .....	34590-94-8	100	600	X
Di-sec octyl phthalate (Di-(2-ethylhexyl) phthalate) .....	117-81-7	—	5	—
Emery .....	12415-34-8	—	—	—
Total dust .....		—	—	—
Respirable fraction .....		—	—	—
Endosulfan .....	115-29-7	—	0.1	X
Endrin .....	72-20-8	—	0.1	X
Epichlorohydrin .....	106-89-8	5	19	X
EPN .....	2104-64-5	—	0.5	X
1,2-Epoxypropane; see Propylene oxide.				
2,3-Epoxy-1-propanol; see Glycidol.				
Ethane .....	74-84-0	E		
Ethanethiol; see Ethyl mercaptan.				
Ethanolamine .....	141-43-5	3	6	—
2-Ethoxyethanol (Cellosolve) .....	110-80-5	200	740	X
2-Ethoxyethyl acetate (Cellosolve acetate) .....	111-15-9	100	540	X
Ethyl acetate .....	141-78-6	400	1400	—
Ethyl acrylate .....	140-88-5	25	100	X
Ethyl alcohol (Ethanol) .....	64-17-5	1000	1900	—
Ethylamine .....	75-04-7	10	18	—
Ethyl amyl ketone (5-Methyl-3-heptanone) .....	541-85-5	25	130	—
Ethyl benzene .....	100-41-4	100	435	—
Ethyl bromide .....	74-96-4	200	890	—
Ethyl butyl ketone (3-Heptanone) .....	106-35-4	50	230	—
Ethyl chloride .....	75-00-3	1000	2600	—
Ethyl ether .....	60-29-7	400	1200	—
Ethyl formate .....	109-94-4	100	300	—
Ethyl mercaptan .....	75-08-1	0.5	1	—
Ethyl silicate .....	78-10-4	100	850	—
Ethylene .....	74-85-1	E		
Ethylene chlorohydrin .....	107-07-3	5	16	X
Ethylenediamine .....	107-15-3	10	25	—
Ethylene dibromide .....	106-93-4	(C)25	(C)190	X
Ethylene dichloride (1,2-Dichloroethane) .....	107-06-2	50	200	—
Ethylene glycol dinitrate .....	628-96-6	(C)0.2	(C)1	X
Ethylene glycol methyl acetate; see Methyl cellosolve acetate.				
Ethyleneimine; see § 1926.1112 .....	151-56-4			
Ethylene oxide; see § 1926.1147 .....	75-21-8			
Ethylidene chloride; see 1,1-Dichloroethane.				
N-Ethylmorpholine .....	100-74-3	20	94	X
Ferbam .....	14484-64-1	—	—	—
Total dust .....		—	15	—
Ferrovandium dust .....	12604-58-9	—	1	—
Fibrous Glass.				
Total dust .....		—	—	—
Respirable fraction .....		—	—	—

THRESHOLD LIMIT VALUES OF AIRBORNE CONTAMINANTS FOR CONSTRUCTION—Continued

Substance	CAS No. <sup>d</sup>	ppm <sup>a</sup>	mg/m <sup>3,b</sup>	Skin Designation
Fluorides (as F) .....	Varies with compound	—	2.5	—
Fluorine .....	7782-41-4	0.1	0.2	—
Fluorotrichloromethane (Trichlorofluoromethane) .....	75-69-4	1000	5600	—
Formaldehyde; see § 1926.1148 .....	50-00-0			
Formic acid .....	64-18-6	5	9	—
Furfural .....	98-01-1	5	20	X
Furfuryl alcohol .....	98-00-0	50	200	—
Gasoline .....	8006-61-9		A <sup>3</sup>	—
Glycerin (mist) .....	56-81-5			
Total dust .....		—		—
Respirable fraction .....		—		—
Glycidol .....	556-52-5	50	150	—
Glycol monoethyl ether; see 2-Ethoxyethanol.				
Graphite, natural, respirable dust .....	7782-42-5	( <sup>2</sup> )	( <sup>2</sup> )	( <sup>2</sup> )
Graphite, synthetic.				
Total dust .....		—		—
Respirable fraction .....		—		—
Guthion; see Azinphos methyl.				
Gypsum .....	13397-24-5			
Total dust .....		—		—
Respirable fraction .....		—		—
Hafnium .....	7440-58-6	—	0.5	—
Helium .....	7440-59-7	E		—
Heptachlor .....	76-44-8	—	0.5	X
Heptane (n-Heptane) .....	142-82-5	500	2000	—
Hexachloroethane .....	67-72-1	1	10	X
Hexachloronaphthalene .....	1335-87-1	—	0.2	X
n-Hexane .....	110-54-3	500	1800	—
2-Hexanone (Methyl n-butyl ketone) .....	591-78-6	100	410	—
Hexone (Methyl isobutyl ketone) .....	108-10-1	100	410	—
sec-Hexyl acetate .....	108-84-9	50	300	—
Hydrazine .....	302-01-2	1	1.3	X
Hydrogen .....	1333-74-0	E		—
Hydrogen bromide .....	10035-10-6	3	10	—
Hydrogen chloride .....	7647-01-0	(C)5	(C)7	—
Hydrogen cyanide .....	74-90-8	10	11	X
Hydrogen fluoride (as F) .....	7664-39-3	3	2	—
Hydrogen peroxide .....	7722-84-1	1	1.4	—
Hydrogen selenide (as Se) .....	7783-07-5	0.05	.02	—
Hydrogen sulfide .....	7783-06-4	10	15	—
Hydroquinone .....	123-31-9	—	2	—
Indene .....	95-13-6	10	45	—
Indium and compounds (as In) .....	7440-74-6	—	0.1	—
Iodine .....	7553-56-2	(C)0.1	(C)1	—
Iron oxide fume .....	1309-37-1	—	10	—
Iron salts (soluble) (as Fe) .....	Varies with compound	—	1	—
Isoamyl acetate .....	123-92-2	100	525	—
Isoamyl alcohol (primary and secondary) .....	123-51-3	100	360	—
Isobutyl acetate .....	110-19-0	150	700	—
Isobutyl alcohol .....	78-83-1	100	300	—
Isophorone .....	78-59-1	25	140	—
Isopropyl acetate .....	108-21-4	250	950	—
Isopropyl alcohol .....	67-63-0	400	980	—
Isopropylamine .....	75-31-0	5	12	—
Isopropyl ether .....	108-20-3	500	2100	—
Isopropyl glycidyl ether (IGE) .....	4016-14-2	50	240	—
Kaolin .....	1332-58-7			

## Occupational Safety and Health Admin., Labor

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## THRESHOLD LIMIT VALUES OF AIRBORNE CONTAMINANTS FOR CONSTRUCTION—Continued

Substance	CAS No. <sup>d</sup>	ppm <sup>a</sup>	mg/m <sup>3,b</sup>	Skin Designation
Total dust .....		—		—
Respirable fraction .....		—		—
Ketene .....	463-51-4	0.5	0.9	—
Lead, inorganic (as Pb); see 1926.62 ..	7439-92-1			
Limestone .....	1317-65-3			
Total dust .....		—		—
Respirable fraction .....		—		—
Lindane .....	58-89-9	—	0.5	X
Lithium hydride .....	7580-67-8	—	0.025	—
L.P.G. (Liquefied petroleum gas) .....	68476-85-7	1000	1800	
Magnesite .....	546-93-0			
Total dust .....		—		—
Respirable fraction .....		—		—
Magnesium oxide fume .....	1309-48-4			
Total particulate .....		15	—	—
Malathion .....	121-75-5			
Total dust .....		—	15	X
Maleic anhydride .....	108-31-6	0.25		
Manganese compounds (as Mn) .....	7439-96-5	—	(C)5	—
Manganese fume (as Mn) .....	7439-96-5	—	(C)5	—
Marble .....	1317-65-3			
Total dust .....		—		—
Respirable fraction .....		—		—
Mercury (aryl and inorganic)(as Hg) .....	7439-97-6		0.1	X
Mercury (organo) alkyl compounds (as Hg) .....	7439-97-6	—	0.01	X
Mercury (vapor) (as Hg) .....	7439-97-6	—	0.1	X
Mesityl oxide .....	141-79-7	25	100	—
Methane .....	74-82-8	E		
Methanethiol; see Methyl mercaptan.				
Methoxychlor .....	72-43-5			
Total dust .....		—	15	—
2-Methoxyethanol (Methyl cellosolve) ...	109-86-4	25	80	X
2-Methoxyethyl acetate (Methyl cellosolve acetate) .....	110-49-6	25	120	X
Methyl acetate .....	79-20-9	200	610	—
Methyl acetylene (Propyne) .....	74-99-7	1000	1650	—
Methyl acetylene-propadiene mixture (MAPP) .....		1000	1800	—
Methyl acrylate .....	96-33-3	10	35	X
Methylal (Dimethoxy-methane) .....	109-87-5	1000	3100	—
Methyl alcohol .....	67-56-1	200	260	—
Methylamine .....	74-89-5	10	12	—
Methyl amyl alcohol; see Methyl isobutyl carbinol.				
Methyl n-amyl ketone .....	110-43-0	100	465	—
Methyl bromide .....	74-83-9	(C)20	(C)80	X
Methyl butyl ketone; see 2-Hexanone.				
Methyl cellosolve; see 2-Methoxyethanol.				
Methyl cellosolve acetate; see 2-Methoxyethyl acetate.				
Methylene chloride; see § 1910.1052.				
Methyl chloroform (1,1,1-Trichloroethane) .....	71-55-6	350	1900	—
Methylcyclohexane .....	108-87-2	500	2000	—
Methylcyclohexanol .....	25639-42-3	100	470	—
o-Methylcyclohexanone .....	583-60-8	100	460	X
Methylene chloride .....	75-09-2	500	1740	—
Methylenedianiline (MDA) .....	101-77-9			
Methyl ethyl ketone (MEK); see 2-Butanone.				



THRESHOLD LIMIT VALUES OF AIRBORNE CONTAMINANTS FOR CONSTRUCTION—Continued

Substance	CAS No. <sup>d</sup>	ppm <sup>a</sup>	mg/m <sup>3,b</sup>	Skin Designation
Methyl formate .....	107–31–3	100	250	—
Methyl hydrazine (Monomethyl hydrazine) .....	60–34–4	(C)0.2	(C)0.35	X
Methyl iodide .....	74–88–4	5	28	X
Methyl isoamyl ketone .....	110–12–3	100	475	—
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 mercaptan .....	74–93–1	0.5	1	—
Methyl methacrylate .....	80–62–6	100	410	—
Methyl propyl ketone; see 2-Pentanone.				
Methyl silicate .....	681–84–5	(C)5	(C)30	—
alpha-Methyl styrene .....	98–83–9	(C)100	(C)480	—
Methylene bisphenyl isocyanate (MDI) .....	101–68–8	(C)0.02	(C)0.2	—
Mica; see Silicates.				
Molybdenum (as Mo) .....	7439–98–7			
Soluble compounds .....		—	5	—
Insoluble compounds.				
Total dust .....		—	15	—
Monomethyl aniline .....	100–61–8	2	9	X
Monomethyl hydrazine; see Methyl hydrazine.				
Morpholine .....	110–91–8	20	70	X
Naphtha (Coal tar) .....	8030–30–6	100	400	—
Naphthalene .....	91–20–3	10	50	—
alpha-Naphthylamine; see § 1926.1104	134–32–7			
beta-Naphthylamine; see § 1926.1109	91–59–8			
Neon .....	7440–01–9	E		—
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	—	1	—
Nicotine .....	54–11–5	—	0.5	X
Nitric acid .....	7697–37–2	2	5	—
Nitric oxide .....	10102–43–9	25	30	—
p-Nitroaniline .....	100–01–6	1	6	X
Nitrobenzene .....	98–95–3	1	5	X
p-Nitrochlorobenzene .....	100–00–5	—	1	X
4-Nitrodiphenyl; see § 1926.1103	92–93–3			
Nitroethane .....	79–24–3	100	310	—
Nitrogen .....	7727–37–9	E		—
Nitrogen dioxide .....	10102–44–0	(C)5	(C)9	—
Nitrogen trifluoride .....	7783–54–2	10	29	—
Nitroglycerin .....	55–63–0	(C)0.2	(C)2	X
Nitromethane .....	75–52–5	100	250	—
1-Nitropropane .....	108–03–2	25	90	—
2-Nitropropane .....	79–46–9	25	90	—
N-Nitrosodimethylamine; see § 1926.1116	62–79–9			
Nitrotoluene (all isomers) .....		5	30	X
o-isomer .....	88–72–2;			
m-isomer .....	99–08–1;			
p-isomer .....	99–99–0			
Nitrotrichloromethane; see Chloropicrin.				
Nitrous oxide .....	10024–97–2	E		—
Octachloronaphthalene .....	2234–13–1	—	0.1	X
Octane .....	111–65–9	400	1900	—
Oil mist, mineral .....	8012–95–1	—	5	—
Osmium tetroxide (as Os) .....	20816–12–0	—	0.002	—
Oxalic acid .....	144–62–7	—	1	—
Oxygen difluoride .....	7783–41–7	0.05	0.1	—
Ozone .....	10028–15–6	0.1	0.2	—

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## THRESHOLD LIMIT VALUES OF AIRBORNE CONTAMINANTS FOR CONSTRUCTION—Continued

Substance	CAS No. <sup>d</sup>	ppm <sup>a</sup>	mg/m <sup>3,b</sup>	Skin Designation
Paraquat, respirable dust .....	4685-14-7; 1910-42-5; 2074-50-2	—	0.5	X
Parathion .....	56-38-2	—	0.1	X
Particulates not otherwise regulated. Total dust organic and inorganic ...		—	15	—
PCB; see Chlorodiphenyl (42% and 54% chlorine).				
Pentaborane .....	19624-22-7	0.005	0.01	—
Pentachloronaphthalene .....	1321-64-8	—	0.5	X
Pentachlorophenol .....	87-86-5	—	0.5	X
Pentaerythritol .....	115-77-5			
Total dust .....		—		—
Respirable fraction .....		—		—
Pentane .....	109-66-0	500	1500	—
2-Pentanone (Methyl propyl ketone) .....	107-87-9	200	700	—
Perchloroethylene (Tetrachloroethylene) .....	127-18-4	100	670	—
Perchloromethyl mercaptan .....	594-42-3	0.1	0.8	—
Perchloryl fluoride .....	7616-94-6	3	13.5	—
Petroleum distillates (Naphtha)(Rubber Solvent) .....			A <sup>3</sup>	—
Phenol .....	108-95-2	5	19	X
p-Phenylene diamine .....	106-50-3	—	0.1	X
Phenyl ether, vapor .....	101-84-8	1	7	—
Phenyl ether-biphenyl mixture, vapor ...		1	7	—
Phenylethylene; see Styrene.				
Phenyl glycidyl ether (PGE) .....	122-60-1	10	60	—
Phenyldiazine .....	100-63-0	5	22	X
Phosdrin (Mevinphos) .....	7786-34-7	—	0.1	X
Phosgene (Carbonyl chloride) .....	75-44-5	0.1	0.4	—
Phosphine .....	7803-51-2	0.3	0.4	—
Phosphoric acid .....	7664-38-2	—	1	—
Phosphorus (yellow) .....	7723-14-0	—	0.1	—
Phosphorus pentachloride .....	10026-13-8	—	1	—
Phosphorus pentasulfide .....	1314-80-3	—	1	—
Phosphorus trichloride .....	7719-12-2	0.5	3	—
Phthalic anhydride .....	85-44-9	2	12	—
Picric acid .....	88-89-1	—	0.1	X
Pindone (2-Pivalyl-1,3-indandione) .....	83-26-1	—	0.1	—
Plaster of Paris .....	26499-65-0			
Total dust .....		—		—
Respirable fraction .....		—		—
Platinum (as Pt) .....	7440-06-4			
Metal .....		—	—	—
Soluble salts .....		—	0.002	—
Polytetrafluoroethylene decomposition products .....			A <sup>2</sup>	
Portland cement .....	65997-15-1			
Total dust .....		—	15	—
Respirable fraction .....		5		—
Propane .....	74-98-6	E		
Propargyl alcohol .....	107-19-7	1	—	X
beta-Propiolactone; see § 1926.1113 ..	57-57-8			
n-Propyl acetate .....	109-60-4	200	840	—
n-Propyl alcohol .....	71-23-8	200	500	—
n-Propyl nitrate .....	627-13-4	25	110	—
Propylene dichloride .....	78-87-5	75	350	—
Propylene imine .....	75-55-8	2	5	X
Propylene oxide .....	75-56-9	100	240	—
Propyne; see Methyl acetylene.				
Pyrethrum .....	8003-34-7	—	5	—

## THRESHOLD LIMIT VALUES OF AIRBORNE CONTAMINANTS FOR CONSTRUCTION—Continued

Substance	CAS No. <sup>d</sup>	ppm <sup>a</sup>	mg/m <sup>3,b</sup>	Skin Designation
Pyridine .....	110–86–1	5	15	—
Quinone .....	106–51–4	0.1	0.4	—
RDX; see Cyclonite.				
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	—
Rotenone .....	83–79–4	—	5	—
Rouge.				
Total dust .....		—		—
Respirable fraction .....		—		—
Selenium compounds (as Se) .....	7782–49–2	—	0.2	—
Selenium hexafluoride (as Se) .....	7783–79–1	0.05	0.4	—
Silica, amorphous, precipitated and gel .....	112926–00–8	( <sup>2</sup> )	( <sup>2</sup> )	( <sup>2</sup> )
Silica, amorphous, diatomaceous earth, containing less than 1% crystalline silica .....	61790–53–2	( <sup>2</sup> )	( <sup>2</sup> )	( <sup>2</sup> )
Silica, crystalline cristobalite, respirable dust .....	14464–46–1	( <sup>2</sup> )	( <sup>2</sup> )	( <sup>2</sup> )
Silica, crystalline quartz, respirable dust .....	14808–60–7	( <sup>2</sup> )	( <sup>2</sup> )	( <sup>2</sup> )
Silica, crystalline tripoli (as quartz), respirable dust .....	1317–95–9	( <sup>2</sup> )	( <sup>2</sup> )	( <sup>2</sup> )
Silica, crystalline tridymite, respirable dust .....	15468–32–3	( <sup>2</sup> )	( <sup>2</sup> )	( <sup>2</sup> )
Silica, fused, respirable dust .....	60676–86–0	( <sup>2</sup> )	( <sup>2</sup> )	( <sup>2</sup> )
Silicates (less than 1% crystalline silica).				
Mica (respirable dust) .....	12001–26–2	( <sup>2</sup> )	( <sup>2</sup> )	( <sup>2</sup> )
Soapstone, total dust .....		( <sup>2</sup> )	( <sup>2</sup> )	( <sup>2</sup> )
Soapstone, respirable dust .....		( <sup>2</sup> )	( <sup>2</sup> )	( <sup>2</sup> )
Talc (containing asbestos); use asbestos limit; see 1926.58.				
Talc (containing no asbestos), respirable dust .....	14807–96–6	( <sup>2</sup> )	( <sup>2</sup> )	( <sup>2</sup> )
Tremolite, asbestiform; see 1926.58.				
Silicon carbide .....	409–21–2			
Total dust .....		—		—
Respirable fraction .....		—		—
Silver, metal and soluble compounds (as Ag) .....	7440–22–4	—	0.01	—
Soapstone; see Silicates.				
Sodium fluoroacetate .....	62–74–8	—	0.05	X
Sodium hydroxide .....	1310–73–2	—	2	—
Starch .....	9005–25–8			
Total dust .....		—		—
Respirable fraction .....		—		—
Stibine .....	7803–52–3	0.1	0.5	—
Stoddard solvent .....	8052–41–3	200	1150	—
Strychnine .....	57–24–9	—	0.15	—
Styrene .....	100–42–5	(C)100	(C)420	—
Sucrose .....	57–50–1			
Total dust .....		—		—
Respirable fraction .....		—		—
Sulfur dioxide .....	7446–09–5	5	13	—
Sulfur hexafluoride .....	2551–62–4	1000	6000	—
Sulfuric acid .....	7664–93–9	—	1	—
Sulfur monochloride .....	10025–67–9	1	6	—
Sulfur pentafluoride .....	5714–22–7	0.025	0.25	—
Sulfuryl fluoride .....	2699–79–8	5	20	—
Systox, see Demeton.				

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## THRESHOLD LIMIT VALUES OF AIRBORNE CONTAMINANTS FOR CONSTRUCTION—Continued

Substance	CAS No. <sup>d</sup>	ppm <sup>a</sup>	mg/m <sup>3,b</sup>	Skin Designation
2,4,5-T (2,4,5-trichlorophenoxyacetic acid) .....	93-76-5	—	10	—
Talc; see Silicates—				
Tantalum, metal and oxide dust .....	7440-25-7	—	5	—
TEDP (Sulfotep) .....	3689-24-5	—	0.2	X
Teflon decomposition products .....			A2	
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 .....		—		—
Respirable fraction .....		—		—
TEPP (Tetraethyl pyrophosphate) .....	107-49-3	—	0.05	X
Terphenyls .....	26140-60-3	(C)1	(C)9	—
1,1,1,2-Tetrachloro-2,2-difluoroethane ..	76-11-9	500	4170	—
1,1,1,2-Tetrachloro-1,2-difluoroethane ..	76-12-0	500	4170	—
1,1,1,2-Tetrachloroethane .....	79-34-5	5	35	X
Tetrachloroethylene; see Perchloroethylene.				
Tetrachloromethane; see Carbon tetrachloride.				
Tetrachloronaphthalene .....	1335-88-2	—	2	X
Tetraethyl lead (as Pb) .....	78-00-2	—	0.1	X
Tetrahydrofuran .....	109-99-9	200	590	—
Tetramethyl lead, (as Pb) .....	75-74-1	—	0.15	X
Tetramethyl succinonitrile .....	3333-52-6	0.5	3	X
Tetranitromethane .....	509-14-8	1	8	—
Tetryl (2,4,6-Trinitrophenylmethylnitramine) .....	479-45-8	—	1.5	X
Thallium, soluble compounds (as Tl) ....	7440-28-0	—	0.1	X
Thiram .....	137-26-8	—	5	—
Tin, inorganic compounds (except oxides) (as Sn) .....	7440-31-5	—	2	—
Tin, organic compounds (as Sn) .....	7440-31-5	—	0.1	—
Tin oxide (as Sn) .....	21651-19-4	—	—	—
Total dust .....		—		—
Respirable fraction .....		—		—
Titanium dioxide .....	13463-67-7			
Total dust .....		—		—
Toluene .....	108-88-3	200	750	—
Toluene-2,4-diisocyanate (TDI) .....	584-84-9	(C)0.02	(C)0.14	—
o-Toluidine .....	95-53-4	5	22	X
Toxaphene; see Chlorinated camphene.				
Tremolite; see Silicates.				
Tributyl phosphate .....	126-73-8	—	5	—
1,1,1-Trichloroethane; see Methyl chloroform.				
1,1,1,2-Trichloroethane .....	79-00-5	10	45	X
Trichloroethylene .....	79-01-6	100	535	—
Trichloromethane; see Chloroform.				
Trichloronaphthalene .....	1321-65-9	—	5	X
1,2,3-Trichloropropane .....	96-18-4	50	300	—
1,1,1,2-Trichloro-1,2,2-trifluoroethane .....	76-13-1	1000	7600	—
Triethylamine .....	121-44-8	25	100	—
Trifluorobromomethane .....	75-63-8	1000	6100	—
Trimethyl benzene .....	25551-13-7	25	120	—
2,4,6-Trinitrophenol; see Picric acid.				
2,4,6-Trinitrophenylmethylnitramine; see Tetryl.				
2,4,6-Trinitrotoluene (TNT) .....	118-96-7	—	1.5	X
Triorthocresyl phosphate .....	78-30-8	—	0.1	—
Triphenyl phosphate .....	115-86-6	—	3	—
Tungsten (as W) .....	7440-33-7			

THRESHOLD LIMIT VALUES OF AIRBORNE CONTAMINANTS FOR CONSTRUCTION—Continued

Substance	CAS No. <sup>d</sup>	ppm <sup>a</sup>	mg/m <sup>3,b</sup>	Skin Designation
Insoluble compounds .....		—	5	—
Soluble compounds .....		—	1	—
Turpentine .....	8006-64-2	100	560	—
Uranium (as U) .....	7440-61-1			
Soluble compounds .....		—	0.2	—
Insoluble compounds .....		—	0.2	—
Vanadium .....	1314-62-1			
Respirable dust (as V <sub>2</sub> O <sub>5</sub> ) .....		—	(C)0.5	—
Fume (as V <sub>2</sub> O <sub>5</sub> ) .....		—	(C)0.1	—
Vegetable oil mist.				
Total dust .....		—		—
Respirable fraction .....		—		—
Vinyl benzene; see Styrene.				
Vinyl chloride; see § 1926.1117 .....	75-01-4			
Vinyl cyanide; see Acrylonitrile.				
Vinyl toluene .....	25013-15-4	100	480	—
Warfarin .....	81-81-2	—	0.1	—
Xylenes (o-, m-, p-isomers) .....	1330-20-7	100	435	—
Xylidine .....	1300-73-8	5	25	X
Yttrium .....	7440-65-5	—	1	—
Zinc chloride fume .....	7646-85-7	—	1	—
Zinc oxide fume .....	1314-13-2	—	5	—
Zinc oxide .....	1314-13-2			
Total dust .....		—	15	—
Respirable fraction .....		—	5	—
Zirconium compounds (as Zr) .....	7440-67-7	—	5	—

MINERAL DUSTS

SILICA:

Crystalline

Quartz. Threshold Limit calculated from the formula .....	250 <sup>(k)</sup>
	%SiO <sub>2+5</sub>

Cristobalite.

Amorphous, including natural diatomaceous earth .....	20
---	----

SILICATES (less than 1% crystalline silica)

Mica .....	20
Portland cement .....	50
Soapstone .....	20
Talc (non-asbestiform) .....	20
Talc (fibrous), use asbestos limit .....	--
Graphite (natural) .....	15

Inert or Nuisance Particulates: <sup>(m)</sup>	50 (or 15 mg/m <sup>3</sup> whichever is the smaller) of total dust <1% SiO <sub>2</sub>
--	--

[Inert or Nuisance Dusts includes all mineral, inorganic, and organic dusts as indicated by examples in TLV's Appendix D]

Conversion factors.

mppcf × 35.3 = million particles per cubic meter = particles per c.c.

Footnotes

<sup>1</sup> [Reserved]

<sup>2</sup> See Mineral Dusts Table.

<sup>3</sup> Use Asbestos Limit § 1926.58.

<sup>4</sup> See 1926.58.

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

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

<sup>a</sup> Parts of vapor or gas per million parts of contaminated air by volume at 25 °C and 760 torr.

<sup>b</sup> Milligrams of substance per cubic meter of air. When entry is in this column only, the value is exact; when listed with a ppm entry, it is approximate.

<sup>c</sup>[Reserved]  
<sup>d</sup>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 CAS numbers for the individual compounds.  
<sup>e</sup>[Reserved]  
<sup>g</sup>For sectors excluded from § 1926.1128 the limit is 10 ppm TWA.  
<sup>h</sup>[Reserved]  
<sup>j</sup>Millions of particles per cubic foot of air, based on impinger samples counted by light-field techniques.  
<sup>k</sup>The percentage of crystalline silica in the formula is the amount determined from airborne samples, except in those instances in which other methods have been shown to be applicable.  
<sup>l</sup>[Reserved]  
<sup>m</sup>Covers all organic and inorganic particulates not otherwise regulated. Same as Particulates Not Otherwise Regulated.  
<sup>n</sup>If the exposure limit in § 1926.1126 is stayed or is otherwise not in effect, the exposure limit is a ceiling of 0.1 mg/m<sup>3</sup>.  
<sup>o</sup>If the exposure limit in § 1926.1126 is stayed or is otherwise not in effect, the exposure limit is 0.1 mg/m<sup>3</sup> (as CrO<sub>3</sub>) as an 8-hour TWA.  
 The 1970 TLV uses letter designations instead of a numerical value as follows:  
 A<sup>1</sup>[Reserved]  
 A<sup>2</sup>Polytetrafluoroethylene decomposition products. Because these products decompose in part by hydrolysis in alkaline solution, they can be quantitatively determined in air as fluoride to provide an index of exposure. No TLV is recommended pending determination of the toxicity of the products, but air concentrations should be minimal.  
 A<sup>3</sup>Gasoline and/or Petroleum Distillates. The composition of these materials varies greatly and thus a single TLV for all types of these materials is no longer applicable. The content of benzene, other aromatics and additives should be determined to arrive at the appropriate TLV.  
 E Simple asphyxiants. The limiting factor is the available oxygen which shall be at least 19.5% and be within the requirements addressing explosion in part 1926.

[39 FR 22801, June 24, 1974, as amended at 51 FR 37007, Oct. 17, 1986; 52 FR 46312, Dec. 4, 1987; 58 FR 35089, June 30, 1993; 61 FR 9249, 9250, Mar. 7, 1996; 61 FR 56856, Nov. 4, 1996; 62 FR 1619, Jan. 10, 1997; 71 FR 10381, Feb. 28, 2006; 71 FR 36009, June 23, 2006]

**§ 1926.56 Illumination.**

(a) *General.* Construction areas, ramps, runways, corridors, offices, shops, and storage areas shall be lighted to not less than the minimum illumination intensities listed in Table D-3 while any work is in progress:

TABLE D-3—MINIMUM ILLUMINATION INTENSITIES IN FOOT-CANDLES

Foot-candles	Area or operation
5 .....	General construction area lighting.
3 .....	General construction areas, concrete placement, excavation and waste areas, accessways, active storage areas, loading platforms, refueling, and field maintenance areas.
5 .....	Indoors: warehouses, corridors, hallways, and exitways.
5 .....	Tunnels, shafts, and general underground work areas: (Exception: minimum of 10 foot-candles is required at tunnel and shaft heading during drilling, mucking, and scaling. Bureau of Mines approved cap lights shall be acceptable for use in the tunnel heading.)
10 .....	General construction plant and shops (e.g., batch plants, screening plants, mechanical and electrical equipment rooms, carpenter shops, rigging lofts and active storerooms, barracks or living quarters, locker or dressing rooms, mess halls, and indoor toilets and work-rooms).
30 .....	First aid stations, infirmaries, and offices.

(b) *Other areas.* For areas or operations not covered above, refer to the American National Standard A11.1-1965, R1970, Practice for Industrial

Lighting, for recommended values of illumination.

**§ 1926.57 Ventilation.**

(a) *General.* Whenever hazardous substances such as dusts, fumes, mists, vapors, or gases exist or are produced in the course of construction work, their concentrations shall not exceed the limits specified in §1926.55(a). When ventilation is used as an engineering control method, the system shall be installed and operated according to the requirements of this section.

(b) *Local exhaust ventilation.* Local exhaust ventilation when used as described in (a) shall be designed to prevent dispersion into the air of dusts, fumes, mists, vapors, and gases in concentrations causing harmful exposure. Such exhaust systems shall be so designed that dusts, fumes, mists, vapors, or gases are not drawn through the work area of employees.

(c) *Design and operation.* Exhaust fans, jets, ducts, hoods, separators, and all necessary appurtenances, including refuse receptacles, shall be so designed, constructed, maintained and operated as to ensure the required protection by maintaining a volume and velocity of exhaust air sufficient to gather dusts, fumes, vapors, or gases from said equipment or process, and to convey