

DEPARTMENT OF LICENSING AND REGULATORY AFFAIRS

DIRECTOR'S OFFICE

OCCUPATIONAL HEALTH STANDARDS

(By authority conferred on the director of the department of licensing and regulatory affairs by sections 14 and 24 of 1974 PA 154, MCL 408.1014 and 408.1024, and Executive Reorganization Orders Nos. 1996-1, 1996-2, 2003-1, 2008-4, and 2011-4, MCL 330.3101, 445.2001, 445.2011, 445.2025, and 445.2030)

PART 601. AIR CONTAMINANTS FOR CONSTRUCTION

R 325.60151 Scope.

Rule 1. (1) An employer shall ensure that employee exposures 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, as listed in R 325.60154 to R 325.60161, are avoided.

(2) To achieve compliance with subrule (1) of this rule, an employer shall ensure that administrative or engineering controls are implemented whenever feasible. If administrative or engineering controls are not feasible to achieve full compliance, then protective equipment or other protective measures shall be used to keep the exposure of employees to air contaminants within the limits prescribed in this rule. Any equipment and technical measures used for this purpose shall first be approved for each particular use by a competent industrial hygienist or other technically qualified person. Respirators shall be used in a manner that is in compliance with Occupational Health Standard Part 451 "Respiratory Protection," as referenced in R 325.60151a.

(3) Occupational Health Standard Part 302 "Vinyl Chloride," as referenced in R 325.60151a, applies to the exposure of every employee to vinyl chloride in every employment and place of employment covered by these rules in place of any different standard on exposure to vinyl chloride that would otherwise be applicable under subrule (1) of this rule.

(4) The "Threshold Limit Values (TLV) of the American Conference of Governmental Industrial Hygienists (A.C.G.I.H.) for 1970" appear in R 325.60153 to R 325.60161. The Threshold Limit Values identified in these rules as Maximum Allowable Concentrations (MAC) are specified in these rules.

(5) These rules do not apply to the following types of employment:

- (a) Agriculture.
- (b) Domestic.
- (c) Mining.
- (d) General industry work.

(6) Exposure to air contaminants in general industry work is covered by Occupational Health Standard Part 301 “Air Contaminants for General Industry,” as referenced in R 325.60151a.

History: 2002 AACCS; 2013 AACCS; 2017 AACCS.

R 325.60151a Availability of referenced standards.

Rule 1a. The following Michigan Occupational Safety and Health (MIOSHA) standards are referenced in these rules. Up to 5 copies of these standards may be obtained at no charge from the Michigan Department of Licensing and Regulatory Affairs, MIOSHA Regulatory Services Section, P.O. Box 30643, Lansing, Michigan, 48909-8143 or via the internet at website: www.michigan.gov/mioshastandards. For quantities greater than 5, the cost, as of the time of adoption of these rules, is 4 cents per page.

(a) Occupational Health Standard Part 301 “Air Contaminants for General Industry,” R 325.51101 to R 325.51108.

(b) Occupational Health Standard Part 302 “Vinyl Chloride,” R 325.51401 to R 325.51414.

(c) Occupational Health Standard Part 303 “Methylenedianiline,” R 325.50051 to R 325.50076.

(d) Occupational Health Standard Part 304 “Ethylene oxide,” R 325.51151 to R 325.51177.

(e) Occupational Health Standard Part 306 “Formaldehyde,” R 325.51451 to R 325.51477.

(f) Occupational Health Standard Part 307 “Acrylonitrile,” R 325.51501 to R 325.51527.

(g) Occupational Health Standard Part 308 “Inorganic Arsenic,” R 325.51601 to R 325.51628.

(h) Occupational Health Standard Part 309 “Cadmium,” R 325.51851 to R 325.51886.

(i) Occupational Health Standard Part 311 “Benzene,” R 325.77101 to R 325.77115.

(j) Occupational Health Standard Part 312 “1,3-Butadiene,” R 325.50091 to R 325.50092.

(k) Occupational Health Standard Part 313 “Methylene Chloride,” R 325.51651 to R 325.51652.

(l) Occupational Health Standard Part 314 “Coke Oven Emissions,” R 325.50101 to R 325.50136.

(m) Occupational Health Standard Part 451 “Respiratory Protection,” R 325.60051 to R 325.60052.

(n) Occupational Health Standard Part 602 “Asbestos Standards for Construction,” R 325.51301 to R 325.51302.

(o) Occupational Health Standard Part 603 “Lead Exposure in Construction,” R 325.51991 to R 325.51992.

(p) Occupational Health Standard Part 604 “Chromium (VI) in Construction,” R 325.51995 to R 325.51997.

History: 2013 AACCS; 2017 AACCS.

R 325.60152 Definitions.

Rule 2. (1) "Maximum allowable concentration" or "MAC" means the threshold limit value or the time-weighted average 8-hour airborne concentration of a contaminant to which a person may be safely exposed.

(2) "Mg/m³" means milligrams of particulate per cubic meter of air.

(3) "Mppcf" means millions of particulates per cubic foot of air based on impinger samples counted by light field microscopic techniques.

(4) "Non-respirable atmosphere" means an atmosphere that contains insufficient oxygen, or an elevated level of contaminants that may render a person incapable of self-rescue.

(5) "Ppm" means parts of vapor or gas per million parts of air by volume at 25 degrees Celsius and 760 millimeters of mercury pressure.

(6) "Source" means a process or equipment that releases a contaminant into the air in concentrations exceeding the MAC.

History: 2002 AACS; 2017 AACS.

R 325.60153 Contaminants; exposures; MAC.

Rule 3. (1) An employer shall not allow an employee to be exposed to a contaminant at concentrations in excess of the MAC as listed in R 325.60154 to R 325.60161.

(2) An employer shall not allow an employee to be exposed to a contaminant or combination of contaminants in concentrations that are hazardous or injurious to the person's health.

History: 2002 AACS.

R 325.60154 Maximum allowable concentrations.

Rule 4. (1) Maximum allowable concentrations of air contaminants based on a repeated 8-hour work day exposure are listed in tables 1 to 7 in R 325.60155 to R 325.60161.

(2) A substance in tables 1 to 6 that is preceded by the letter A, C, S, or STEL is an especially hazardous contaminant and all the following precautions shall be taken:

(a) If the substance is preceded by the letter "A", then an employer shall ensure that an employee or any part of an employee's anatomy is not exposed to, or allowed to come in contact with, the substance by means of any respiratory, oral, or skin route.

(b) If the substance is preceded by the letter "C", then its MAC means the highest concentration at which an employer may allow a person to be exposed at any time unless noted otherwise. This concentration is commonly referred to as a "ceiling."

(c) If the substance is preceded by the letter "S", then an employer shall ensure that precautions are taken to prevent skin absorption.

(d) If the substance is preceded by "STEL", then it means the STEL listed. For example, an employee's 15-minute, time-weighted average exposure, shall not be exceeded at any time during a work day. The STEL is commonly referred to as the "short-term exposure limit."

History: 2002 AACCS; 2013 AACCS.

R 325.60155 Maximum allowable concentrations for substances; A and B.

Rule 5. Table 1 for substances A and B, are as follows:

TABLE 1 MAXIMUM ALLOWABLE CONCENTRATIONS FOR SUBSTANCES; A AND B				
SUBSTANCE		CAS No. ¹	MAC/Ceiling/STEL	
			ppm	mg/m ³
	Abate	3383-96-8	---	15
	Acetaldehyde	75-07-0	200	360
	Acetic acid	64-19-7	10	25
	Acetic anhydride	108-24-7	5	20
	Acetone	67-64-1	1,000	2,400
	Acetonitrile	75-05-8	40	70
	Acetylene		Inert gas	
	Acetylene dichloride	See 1,2-Dichloroethylene		
	Acetylene tetrabromide	79-27-6	1	14
	Acrolein	107-02-8	0.1	0.25
S	Acrylamide	79-06-1	---	0.3
S	Acrylonitrile	See OH 307 Acrylonitrile*		
S	Aldrin	309-00-2	---	0.25
S	Allyl alcohol	107-18-6	2	5
	Allyl chloride	107-05-1	1	3
C	Allyl glycidyl ether (AGE)	106-92-3	10	45
	Allyl propyl disulfide	2179-59-1	2	12
	Alundum (Al ₂ O ₃)		Inert dust	
	2-Aminoethanol	See Ethanolamine		
	2-Aminopyridine	504-29-0	0.5	2
	Ammonia	7664-41-7	50	35
	Ammonium sulfamate (amate)	7773-06-0	---	15
	n-Amyl acetate	628-63-7	100	525
	sec-Amyl acetate	626-38-0	125	650
S	Aniline	62-53-3	5	19
S	Anisidine (o- and p-isomers)	29191-52-4	---	0.5

TABLE 1 MAXIMUM ALLOWABLE CONCENTRATIONS FOR SUBSTANCES; A AND B				
SUBSTANCE		CAS No. ¹	MAC/Ceiling/STEL	
			ppm	mg/m ³
	Antimony and compounds (as Sb)	7440-36-0	---	0.5
	ANTU (alpha naphthylthiourea)	86-88-4	---	0.3
	Argon		Inert gas	
	Arsenic, inorganic compounds	See OH 308 Inorganic Arsenic*		
	Arsenic, organic compounds (as As)	7440-38-2	---	0.5
	Arsine	7784-42-1	0.05	0.2
S	Azinphos-methyl	86-50-0	---	0.2
	Barium (soluble compounds)	7440-39-3	---	0.5
	Benzene (benzol)	See OH 311 Benzene*		
A, S	Benzidine	92-87-5	---	---
	p-Benzoquinone	See Quinone		
	Benzoyl peroxide	94-36-0	---	5
	Benzyl chloride	100-44-7	1	5
	Beryllium	7440-41-7	---	0.002
	Biphenyl	See Diphenyl		
	Bisphenol A	See Diglycidyl ether		
	Boron oxide	1303-86-2	---	15
	Boron tribromide	10294-33-4	1	10
C	Boron trifluoride	7637-07-2	1	3
	Bromine	7726-95-6	0.1	0.7
	Bromine pentafluoride	7789-30-2	0.1	0.7
S	Bromoform	75-25-2	0.5	5
	Butadiene (1,3-butadiene)	See OH 312 1,3-Butadiene*		
	Butanethiol	See Butyl mercaptan		
	2-Butanone	78-93-3	200	590
S	2-Butoxy ethanol (butyl cellosolve)	111-76-2	50	240
	Butyl acetate (n-butyl acetate)	123-86-4	150	710
	sec-Butyl acetate	105-46-4	200	950
	tert-Butyl acetate	540-88-5	200	950
	Butyl alcohol	71-36-3	100	300

TABLE 1 MAXIMUM ALLOWABLE CONCENTRATIONS FOR SUBSTANCES; A AND B				
SUBSTANCE		CAS No. ¹	MAC/Ceiling/STEL	
			ppm	mg/m ³
	sec-Butyl alcohol	78-92-2	150	450
	tert-Butyl alcohol	75-65-0	100	300
S, C	Butylamine	109-73-9	5	15
	tert-Butyl chromate (as Cr+6)	See OH 604 Chromium (VI) in Construction*, **		
	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
1	The CAS number is for information only. Enforcement is based on the substance name. For an entry covering more than 1 metal compound measured as the metal, the CAS number for the metal is given - not the CAS number for the individual compounds.			
A	See R 325.60154(2)(a).			
B	See R 325.60154(2)(b).			
C	See R 325.60154(2)(c).			
*	Caution--these rules contain extensive requirements for exposure to these substances.			
**	If the exposure limit in OH 604 Chromium (VI) in Construction is stayed or is otherwise not in effect, the exposure limit is a ceiling of 0.1 mg/m ³ and has an "S" notation.			
All MIOSHA Occupational Health (OH) Standards shown in this table are referenced in R 325.60151a.				

History: 2002 AACS; 2013 AACS; 2017 AACS.

R 325.60156 Maximum allowable concentrations for substances; C and D.

Rule 6. Table 2 for substances C and D, are as follows:

TABLE 2 MAXIMUM ALLOWABLE CONCENTRATIONS FOR SUBSTANCES; C AND D				
SUBSTANCE		CAS No. ¹	MAC/Ceiling/STEL	
			ppm	mg/m ³
	Cadmium and cadmium compounds	See OH 309 Cadmium*		
	Calcium arsenate		---	1
	Calcium carbonate	1317-65-3	Inert dust	
	Calcium oxide	1305-78-8	---	5

TABLE 2
MAXIMUM ALLOWABLE CONCENTRATIONS FOR SUBSTANCES; C AND D

SUBSTANCE	CAS No. ¹	MAC/Ceiling/STEL		
		ppm	mg/m ³	
	Camphor (synthetic)	76-22-2	2	---
	Carbaryl (Sevin®)	63-25-2	---	5
	Carbon black	1333-86-4	---	3.5
	Carbon dioxide	124-38-9	5,000	9,000
S	Carbon disulfide	75-15-0	20	60
	Carbon monoxide	630-08-0	50	55
S, C	Carbon tetrachloride	56-23-5	10	65
	Cellulose (paper fiber)	9004-34-6	Inert dust	
S	Chlordane	57-74-9	---	0.5
S	Chlorinated camphene	8001-35-2	---	0.5
	Chlorinated diphenyl oxide	55720-99-5 or 31242-93-0	---	0.5
	Chlorine	7782-50-5	1	3
	Chlorine dioxide	10049-04-4	0.1	0.3
C	Chlorine trifluoride	7790-91-2	0.1	0.4
C	Chloroacetaldehyde	107-20-0	1	3
	alpha-Chloroacetophenone (Phenacyl chloride)	532-27-4	0.05	0.3
	Chlorobenzene (mono chlorobenzene)	108-90-7	75	350
	o-Chlorobenzylidene malononitrile (OCBM)	2698-41-1	0.05	0.4
	Chlorobromomethane	74-97-5	200	1,050
	2-Chloro-1,3-butadiene	See Chloroprene		
S	Chlorodiphenyl (42% Chlorine)	53469-21-9	---	1
S	Chlorodiphenyl (54% Chlorine)	11097-69-1	---	0.5
	1-Chloro-2,3-epoxy propane	See Epichlorohydrin		
	2-Chloroethanol	See Ethylene chlorohydrin		
	Chloroethylene	See Vinyl chloride		
C	Chloroform (Trichloromethane)	67-66-3	50	240
	1-Chloro-1-nitropropane	600-25-9	20	100
	Chloropicrin	76-06-2	0.1	0.7
S	Chloroprene (2-chloro-1,3-butadiene)	126-99-8	25	90

TABLE 2 MAXIMUM ALLOWABLE CONCENTRATIONS FOR SUBSTANCES; C AND D				
SUBSTANCE		CAS No. ¹	MAC/Ceiling/STEL	
			ppm	mg/m ³
	Chromic acid and chromates (as CrO ₃)	See OH 604 Chromium (VI) in Construction*, ***		
	Chromium (VI) compounds	See OH 604 Chromium (VI) in Construction*, ***		
	Chromium			
	sol. chromic and chromous salts (as Cr)	Varies with compound	---	0.5
	Metal and insol. Salts	7440-47-3	---	1
	Coal tar pitch volatiles (benzene soluble fraction: anthracene, BaP, phenanthrene, acridine, chrysene, pyrene)	65996-93-2	---	0.2
	Cobalt, metal fume and dust	7440-48-4	—	0.1
	Coke oven emissions	See OH 314 Coke Oven Emissions*		
	Copper			
	Fume	7440-50-8	---	0.1
	Dusts and mists		---	1
	Corundum (Al ₂ O ₃)	Inert dust		
	Cotton dust (raw)	—	---	1
	Crag® herbicide	136-78-7	---	15
S	Cresol (all isomers)	1319-77-3	5	22
	Crotonaldehyde	123-73-9 4170-30-3	2	6
S	Cumene	98-82-8	50	245
S	Cyanide (as CN)	Varies with compound	---	5
	Cyanogen	460-19-5	10	---
	Cyclohexane	110-82-7	300	1,050
	Cyclohexanol	108-93-0	50	200
	Cyclohexanone	108-94-1	50	200
	Cyclohexene	110-83-8	300	1,015
	Cyclopentadiene	542-92-7	75	200
	2,4-D	94-75-7	---	10
S	DDT (Dichlorodiphenyl-trichloroethane)	50-29-3	---	1
	DDVP	See Dichlorvos		

TABLE 2
MAXIMUM ALLOWABLE CONCENTRATIONS FOR SUBSTANCES; C AND D

SUBSTANCE		CAS No. ¹	MAC/Ceiling/STEL	
			ppm	mg/m ³
S	Decaborane	17702-41-9	0.05	0.3
S	Demeton®	8065-48-3	---	0.1
	Diacetone alcohol (4-hydroxy-4-methyl-2-pentanone)	123-42-2	50	240
	1,2-Diainoethane	See Ethylenediamine		
	Diazomethane	334-88-3	0.2	0.4
	Diborane	19287-45-7	0.1	0.1
S, C	1,2-Dibromoethane (ethylene dibromide)	106-93-4	25	190
	Dibutyl phosphate	107-66-4	1	5
	Dibutyl phthalate	84-74-2	---	5
C	Dichloroacetylene	7572-29-4	0.1	0.4
C	o-Dichlorobenzene	95-50-1	50	300
	p-Dichlorobenzene	106-46-7	75	450
	Dichlorodifluoromethane	75-71-8	1,000	4,950
	1,3-Dichloro-5, 5-dimethyl hydantoin	118-52-5	---	0.2
	1,1-Dichloroethane	75-34-3	100	400
	1,2-Dichloroethane	107-06-2	50	200
	1,2-Dichloroethylene	540-59-0	200	790
S, C	Dichloroethyl ether	111-44-4	15	90
	Dichloromethane	See Methylene chloride		
	Dichloromonofluoromethane	75-69-4	1,000	4,200
C	1,1-Dichloro-1-nitroethane	594-72-9	10	60
	1,2-Dichloropropane	See Propylene dichloride		
	Dichlorotetrafluoroethane	76-14-2	1,000	7,000
S	Dichlorvos (DDVP)	62-73-7	---	1
S	Dieldrin	60-57-1	---	0.25
	Diethylamine	109-89-7	25	75
S	Diethylamino, ethanol	100-37-8	10	50
S, C	Diethylene triamine	111-40-0	10	42
	Diethyl ether	See Ethyl ether		
	Difluorodibromomethane	75-61-6	100	860

TABLE 2 MAXIMUM ALLOWABLE CONCENTRATIONS FOR SUBSTANCES; C AND D				
SUBSTANCE		CAS No. ¹	MAC/Ceiling/STEL	
			ppm	mg/m ³
C	Diglycidyl ether (DGE)	2238-07-5	0.5	2.8
	Dihydroxybenzene	See Hydroquinone		
	Diisobutyl ketone	108-83-8	50	290
S	Diisopropylamine	108-18-9	5	20
	Dimethoxymethane	See Methylal		
S	Dimethyl acetamide	127-19-5	10	35
	Dimethylamine	124-40-3	10	18
	Dimethylaminobenzene	See Xylidene		
S	Dimethylaniline (N-dimethylaniline)	121-69-7	5	25
	Dimethylbenzene	See Xylene		
	Dimethyl-1, 2-dibromo- 2, 2-dichloroethyl phosphate (Dibrom®)	300-76-5	---	3
S	Dimethylformamide	68-12-2	10	30
	2,6-Dimethylheptanone	See Diisobutyl ketone		
S	1,1-Dimethylhydrazine	57-14-7	0.5	1
	Dimethylphthalate	131-11-3	---	5
S	Dimethyl sulfate	77-78-1	1	5
S	Dinitrobenzene (all isomers)	99-65-0 528-29-0 100-25-4	---	1
S	Dinitro-o-cresol	534-52-1	---	0.2
S	Dinitrotoluene	25321-14-6	---	1.5
S	Dioxane (diethylene dioxide)	123-91-1	100	360
	Diphenyl	92-52-4	0.2	1
	Diphenylamine	122-39-4	---	10
	Diphenylmethane diisocyanate	See Methylene bisphenyl isocyanate (MDI)		
S	Dipropylene glycol methyl ether	34590-94-8	100	600
	Di-sec-octyl phthalate (di-2-ethylhexylphthalate)	117-81-7	---	5
1	The CAS number is for information only. Enforcement is based on the substance name. For an entry covering more than 1 metal compound measured as the metal, the CAS number for the metal is given - not the CAS number for the individual compounds.			

TABLE 2 MAXIMUM ALLOWABLE CONCENTRATIONS FOR SUBSTANCES; C AND D				
SUBSTANCE		CAS No. ¹	MAC/Ceiling/STEL	
			ppm	mg/m ³
A	See R 325.60154(2)(a).			
B	See R 325.60154(2)(b).			
C	See R 325.60154(2)(c).			
*	Caution--these rules contain extensive requirements for exposure to these substances.			
***	If the exposure limit in OH 604 Chromium (VI) in Construction is stayed or is otherwise not in effect, the exposure limit is 0.1 mg/m ³ for chromic acid and chromates (CrO ₃) as an 8-hour TWA.			
All MIOSHA Occupational Health (OH) Standards shown in this table are referenced in R 325.60151a.				

History: 2002 AACCS; 2013 AACCS; 2017 AACCS.

R 325.60157 Maximum allowable concentrations for substances; E to H.

Rule 7. Table 3 for substances E to H, are as follows:

TABLE 3 MAXIMUM ALLOWABLE CONCENTRATIONS FOR SUBSTANCES; E TO H				
SUBSTANCE		CAS No. ¹	MAC/Ceiling/STEL	
			ppm	mg/m ³
	Emery		Inert dust	
S	Endosulfan (Thiodan®)	115-29-7	---	0.1
S	Endrin	72-20-8	---	0.1
S	Epichlorohydrin	106-89-8	5	19
S	EPN	2104-64-5	---	0.5
	1,2-Epoxypropane	See Propylene oxide		
	2,3-Epoxy-1-propanol	See Glycidol		
	Ethane		Inert gas	
	Ethanethiol	See Ethyl mercaptan		
	Ethanolamine	141-43-5	3	6
S	2-Ethoxyethanol	110-80-5	200	740
S	2-Ethoxyethyl acetate (cellosolve acetate)	111-15-9	100	540
	Ethyl acetate	141-78-6	400	1,400

TABLE 3
MAXIMUM ALLOWABLE CONCENTRATIONS FOR SUBSTANCES; E TO H

SUBSTANCE		CAS No. ¹	MAC/Ceiling/STEL	
			ppm	mg/m ³
S	Ethyl acrylate	140-88-5	25	100
	Ethyl alcohol (ethanol)	64-17-5	1,000	1,900
	Ethylamine	75-04-7	10	18
	Ethyl sec-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	1,000	2,600
	Ethyl ether	60-29-7	400	1,200
	Ethyl formate	109-94-4	100	300
	Ethyl mercaptan	75-08-1	0.5	1
	Ethyl silicate	78-10-4	100	850
	Ethylene		Inert gas	
S	Ethylene chlorohydrin	107-07-3	5	16
	Ethylenediamine	107-15-3	10	25
	Ethylene dibromide	See 1,2-Dibromoethane		
	Ethylene dichloride	See 1,2-Dichloroethane		
S, C	Ethylene glycol dinitrate	628-96-6	0.2	1
	Ethylene glycol monomethyl ether acetate	See Methyl cellosolve acetate		
S	Ethyleneimine	151-56-4	0.5	1
	Ethylene oxide	See OH 304 Ethylene Oxide*		
	Ethylidene chloride	See 1,1-Dichloroethane		
S	N-Ethylmorpholine	100-74-3	20	94
	Ferbam	14484-64-1	---	15
	Ferrovandium dust	12604-58-9	---	1
	Fibrous glass		Inert dust	
	Fluoride (as F)	Varies with compound	---	2.5
	Fluorine	7782-41-4	0.1	0.2
	Fluorotrichloromethane	75-69-4	1,000	5,600
C	Formaldehyde	See OH 306 Formaldehyde*		

TABLE 3
MAXIMUM ALLOWABLE CONCENTRATIONS FOR SUBSTANCES; E TO H

SUBSTANCE		CAS No. ¹	MAC/Ceiling/STEL	
			ppm	mg/m ³
	Formic acid	64-18-6	5	9
S	Furfural	98-01-1	5	20
	Furfuryl alcohol	98-00-0	50	200
Gasoline (limits will be based on aromatic hydrocarbons in mixture)				
Glycerine mist			Inert mist	
	Glycidol (2,3-epoxy-1-propanol)	556-52-5	50	150
Glycol monoethyl ether		See 2-Ethoxyethanol		
Graphite (synthetic)			Inert dust	
Guthion®		See Azinphos-methyl		
	Gypsum	13397-24-5	Inert dust	
	Hafnium	7440-58-6	---	0.5
Helium			Inert gas	
S	Heptachlor	76-44-8	---	0.5
	Heptane (n-heptane)	142-82-5	500	2,000
S	Hexachloroethane	67-72-1	1	10
S	Hexachloronaphthalene	1335-87-1	---	0.2
	Hexane (n-hexane)	110-54-3	500	1,800
	2-Hexanone	591-78-6	100	410
	Hexone (methyl isobutyl ketone)	108-10-1	100	410
	sec-Hexyl acetate	108-84-9	50	300
S	Hydrazine	302-01-2	1	1.3
Hydrogen			Inert gas	
	Hydrogen bromide	10035-10-6	3	10
C	Hydrogen chloride	7647-01-0	5	7
S	Hydrogen cyanide	74-90-8	10	11
	Hydrogen fluoride	7664-39-3	3	2
	Hydrogen peroxide	7722-84-1	1	1.4
	Hydrogen selenide	7783-07-5	0.05	0.2
	Hydrogen sulfide	7783-06-4	10	15
	Hydroquinone	123-31-9	---	2

TABLE 3 MAXIMUM ALLOWABLE CONCENTRATIONS FOR SUBSTANCES; E TO H				
SUBSTANCE		CAS No. ¹	MAC/Ceiling/STEL	
			ppm	mg/m ³
1	The CAS number is for information only. Enforcement is based on the substance name. For an entry covering more than 1 metal compound measured as the metal, the CAS number for the metal is given - not the CAS number for the individual compounds.			
A	See R 325.60154(2)(a).			
B	See R 325.60154(2)(b).			
C	See R 325.60154(2)(c).			
*	Caution--these rules contain extensive requirements for exposure to these substances.			
All MIOSHA Occupational Health (OH) Standards shown in this table are referenced in R 325.60151a.				

History: 2002 AACCS; 2013 AACCS; 2017 AACCS.

R 325.60158 Maximum allowable concentrations for substances; I to M.

Rule 8. Table 4 for substances I to M, are as follows:

TABLE 4 MAXIMUM ALLOWABLE CONCENTRATIONS FOR SUBSTANCES; I TO M				
SUBSTANCE		CAS No. ¹	MAC/Ceiling/STEL	
			ppm	mg/m ³
	Indene	95-13-6	10	45
	Indium and compounds (as In)	7440-74-6	---	0.1
C	Iodine	7553-56-2	0.1	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	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

TABLE 4
MAXIMUM ALLOWABLE CONCENTRATIONS FOR SUBSTANCES; I TO M

SUBSTANCE		CAS No. ¹	MAC/Ceiling/STEL	
			ppm	mg/m ³
	Isopropylamine	75-31-0	5	12
	Isopropyl ether	108-20-3	500	2,100
	Isopropyl glycidyl ether (IGE)	4016-14-2	50	240
	Kaolin		Inert dust	
	Ketene	463-51-4	0.5	0.9
	Lead and lead compounds	See OH Part 603 Lead Exposure in Construction*		
	Limestone	1317-65-3	Inert dust	
S	Lindane	58-89-9	---	0.5
	Lithium hydride	7580-67-8	---	0.025
	L.P.G. (Liquified petroleum gas)	68476-85-7	1,000	1,800
	Magnesite	546-93-0	Inert dust	
	Magnesium oxide fume	1309-48-4	15	
S	Malathion	121-75-5	---	15
	Maleic anhydride	108-31-6	0.25	1
C	Manganese and compounds (as Mn)	7439-96-5	---	5
	Marble	1317-65-3	Inert dust	
S	Mercury	7439-97-6	---	0.1
S	Mercury (organic compounds)	Varies with compound	---	0.01
	Mesityl oxide	141-79-7	25	100
	Methane		Inert gas	
	Methanethiol	See Methyl mercaptan		
	Methoxychlor	72-43-5	---	15
	2-Methoxyethanol	See Methyl cellosolve		
	Methyl acetate	79-20-9	200	610
	Methyl acetylene (propyne)	74-99-7	1,000	1,650
	Methyl acetylene-propadiene mixture (MAPP)	–	1,000	1,800
S	Methyl acrylate	96-33-3	10	35
	Methylal (dimethoxymethane)	109-87-5	1,000	3,100
	Methyl alcohol (methanol)	67-56-1	200	260
	Methylamine	74-89-5	10	12

TABLE 4 MAXIMUM ALLOWABLE CONCENTRATIONS FOR SUBSTANCES; I TO M				
SUBSTANCE		CAS No. ¹	MAC/Ceiling/STEL	
			ppm	mg/m ³
	Methyl amyl alcohol	See Methyl isobutyl carbinol		
	Methyl (n-amyl) ketone (2-heptanone)	110-43-0	100	465
S, C	Methyl bromide	74-83-9	20	80
	Methyl butyl ketone	See 2-Hexanone		
S	Methyl cellosolve	109-86-4	25	80
S	Methyl cellosolve acetate	110-49-6	25	120
C	Methyl chloride	74-87-3	100	210
	Methyl chloroform	71-55-6	350	1,900
	Methylcyclohexane	108-87-2	500	2,000
	Methylcyclohexanol	25639-42-3	100	470
S	o-Methylcyclohexanone	583-60-8	100	460
	Methylenedianiline (MDA)	See OH 303 Methylenedianiline (MDA)*		
	Methyl ethyl ketone (MEK)	See 2-Butanone		
	Methyl formate	107-31-3	100	250
S	Methyl iodide	74-88-4	5	28
	Methyl isoamyl ketone	110-12-3	100	475
S	Methyl isobutyl carbinol	108-11-2	25	100
	Methyl isobutyl ketone	See Hexone		
S	Methyl isocyanate	624-83-9	0.02	0.05
	Methyl mercaptan	74-93-1	0.5	1
	Methyl methacrylate	80-62-6	100	410
	Methyl propyl ketone	See 2-Pentanone		
C	Methyl silicate	681-84-5	5	30
C	alpha-Methyl styrene	98-83-9	100	480
C	Methylene bisphenyl isocyanate (MDI)	101-68-8	0.02	0.2
	Methylene chloride (dichloromethane)	See OH 313 Methylene Chloride*		
	Molybdenum			
	Soluble compounds	7439-98-7	---	5
	Insoluble compounds		---	15
S	Monomethyl aniline	100-61-8	2	9

TABLE 4 MAXIMUM ALLOWABLE CONCENTRATIONS FOR SUBSTANCES; I TO M				
SUBSTANCE		CAS No. ¹	MAC/Ceiling/STEL	
			ppm	mg/m ³
S, C	Monomethyl hydrazine	60-34-4	0.2	0.35
S	Morpholine	110-91-8	20	70
1	The CAS number is for information only. Enforcement is based on the substance name. For an entry covering more than 1 metal compound measured as the metal, the CAS number for the metal is given - not the CAS number for the individual compounds.			
A	See R 325.60154(2)(a).			
B	See R 325.60154(2)(b).			
C	See R 325.60154(2)(c).			
STEL	See R 325.60154(d)			
*	Caution--these rules contain extensive requirements for exposure to these substances.			
All MIOSHA Occupational Health (OH) Standards shown in this table are referenced in R 325.60151a.				

History: 2002 AACCS; 2013 AACCS; 2017 AACCS.

R 325.60159 Maximum allowable concentrations for substances; N to P.

Rule 9. Table 5 for substances N to P, are as follows:

TABLE 5 MAXIMUM ALLOWABLE CONCENTRATIONS FOR SUBSTANCES; N TO P				
SUBSTANCE		CAS No. ¹	MAC/Ceiling/STEL	
			ppm	mg/m ³
	Naphtha (coal tar)	8030-30-6	100	400
	Naphtha (petroleum) (MAC will be based on aromatic hydrocarbons in mixture)			
	Naphthalene	91-20-3	10	50
A	beta-Naphthylamine	91-59-8	---	
	Neon		Inert gas	
	Nickel carbonyl	13463-39-3	0.001	0.007
	Nickel, metal and soluble compounds (as Ni)	7440-02-0	---	1
S	Nicotine	54-11-5	---	0.5
	Nitric acid	7697-37-2	2	5

SUBSTANCE		CAS No. ¹	MAC/Ceiling/STEL	
			ppm	mg/m ³
	Nitric oxide	10102-43-9	25	30
S	p-Nitroaniline	100-01-6	1	6
S	Nitrobenzene	98-95-3	1	5
S	p-Nitrochlorobenzene	100-00-5	---	1
	Nitroethane	79-24-3	100	310
	Nitrogen		Inert gas	
	Nitrogen dioxide	10102-44-0	5	9
	Nitrogen trifluoride	7783-54-2	10	29
S	Nitroglycerin	55-63-0	0.2	2
	Nitromethane	75-52-5	100	250
	1-Nitropropane	108-03-2	25	90
	2-Nitropropane	79-46-9	25	90
S, A	N-Nitrosodimethylamine (dimethylnitrosamine)	62-75-9	---	
S	Nitrotoluene	Varies with compound	5	30
	Nitrotrichloromethane	See Chloropicrin		
	Nitrous oxide		Inert gas	
S	Octachloronaphthalene	2234-13-1	---	0.1
	Octane	111-65-9	400	1,900
	Oil mist, particulate	8012-95-1	---	5
	Oil mist, vapor	(MAC will be based on aromatic hydrocarbons in mixture)		
	Osmium tetroxide	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
S	Paraquat	1910-42-5 2074-50-2 4685-14-7	---	0.5
S	Parathion	56-38-2	---	0.1
	Pentaborane	19624-22-7	0.005	0.01
S	Pentachloronaphthalene	1321-64-8	---	0.5

TABLE 5 MAXIMUM ALLOWABLE CONCENTRATIONS FOR SUBSTANCES; N TO P				
SUBSTANCE		CAS No. ¹	MAC/Ceiling/STEL	
			ppm	mg/m ³
S	Pentachlorophenol	87-86-5	---	0.5
	Pentaerythritol	115-77-5	Inert particulate	
	Pentane	109-66-0	500	1,500
	2-Pentanone	107-87-9	200	700
	Perchloroethylene	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) (MAC will be based on aromatic hydrocarbons in mixture)			
S	Phenol	108-95-2	5	19
S	p-Phenylenediamine	101-84-8	---	0.1
	Phenyl ether (vapor)	—	1	7
	Phenyl ether-biphenyl mixture (vapor)	8004-13-5	1	7
	Phenylethylene	See Styrene		
	Phenyl glycidyl ether (PGE)	122-60-1	10	60
S	Phenylhydrazine	100-63-0	5	22
S	Phosdrin (Mevinphos®)	7786-34-7	---	0.1
	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
S	Picric acid	88-89-1	---	0.1
	Pival® (2-pivalyl-1,3-indandione)	83-26-1	---	0.1
	Plaster of Paris	26499-65-0	Inert dust	
	Platinum, soluble salts (as Pt)	7440-06-4	---	0.002
	Polytetrafluoroethylene decomposition products	See Teflon® decomposition products		
	Propane	74-98-6	Inert gas	

TABLE 5 MAXIMUM ALLOWABLE CONCENTRATIONS FOR SUBSTANCES; N TO P				
SUBSTANCE		CAS No. ¹	MAC/Ceiling/STEL	
			ppm	mg/m ³
S	Propargyl alcohol	107-19-7	1	---
A	beta-Propiolactone	57-57-8	---	
	n-Propyl acetate	109-60-4	200	840
	Propyl alcohol	71-23-8	200	500
	n-Propyl nitrate	627-13-4	25	110
	Propylene dichloride	78-87-5	75	350
S	Propylene imine	75-55-8	2	5
	Propylene oxide	75-56-9	100	240
	Propyne	See Methyl acetylene		
	Pyrethrum	8003-34-7	---	5
	Pyridine	110-86-1	5	15
1	The CAS number is for information only. Enforcement is based on the substance name. For an entry covering more than 1 metal compound measured as the metal, the CAS number for the metal is given - not the CAS number for the individual compounds.			
A	See R 325.60154(2)(a).			
B	See R 325.60154(2)(b).			
C	See R 325.60154(2)(c).			
All MIOSHA Occupational Health (OH) Standards shown in this table are referenced in R 325.60151a.				

History: 2002 AACCS; 2013 AACCS; 2017 AACCS.

R 325.60160 Maximum allowable concentrations for substances; Q to Z.

Rule 10. Table 6 for substances Q to Z, are as follows:

TABLE 6 MAXIMUM ALLOWABLE CONCENTRATIONS FOR SUBSTANCES; Q TO Z				
SUBSTANCE		CAS No. ¹	MAC/Ceiling/STEL	
			ppm	mg/m ³
	Quinone	106-51-4	0.1	0.4
S	RDX	121-82-4	---	1.5

TABLE 6
MAXIMUM ALLOWABLE CONCENTRATIONS FOR SUBSTANCES; Q TO Z

SUBSTANCE	CAS No. ¹	MAC/Ceiling/STEL	
		ppm	mg/m ³
Rhodium			
metal fume, dusts, and insoluble compounds (as Rh)	7440-16-6	---	0.1
soluble compounds (as Rh)		---	0.001
Ronnel	299-84-3	---	10
Rotenone (commercial)	83-79-4	---	5
Rouge		Inert dust	
Selenium compounds (as Se)	7782-49-2	---	0.2
Selenium hexafluoride	7783-79-1	0.05	0.4
Silica, crystalline, respirable dust**	See OH 690 Silica in Construction		
Cristobalite	14464-46-1		
Quartz	14808-60-7		
Tripoli (as quartz)	1317-95-9		
Trydimite	15468-32-3		
Silicon carbide	409-21-2	Inert dust	
Silver, metal and soluble compounds	7440-22-4	---	0.01
S Sodium fluoroacetate (1080)	62-74-8	---	0.05
Sodium hydroxide	1310-73-2	---	2
Starch	9005-25-8	Inert dust	
Stibine	7803-52-3	0.1	0.5
Stoddard solvent	8052-41-3	200	1,150
Strychnine	57-24-9	---	0.15
C Styrene monomer (phenylethylene)	100-42-5	100	420
Sucrose	57-50-1	Inert dust	
Sulfur dioxide	7446-09-5	5	13
Sulfur hexafluoride	2551-62-4	1,000	6,000
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®		

TABLE 6
 MAXIMUM ALLOWABLE CONCENTRATIONS FOR SUBSTANCES; Q TO Z

SUBSTANCE	CAS No. ¹	MAC/Ceiling/STEL		
		ppm	mg/m ³	
	2,4,5T	93-76-5	---	10
	Tantalum	7440-25-7	---	5
S	TEDP	3689-24-5	---	0.2
	Teflon® decomposition products (maintain minimal air concentration)			
	Tellurium	13494-80-9	---	0.1
	Tellurium hexafluoride	7783-80-4	0.02	0.2
S	TEPP	107-49-3	---	0.05
C	Terphenyls	26140-60-3	1	9
	1,1,1,2-Tetrachloro-2,2-difluoroethane	76-11-9	500	4,170
	1,1,2,2-Tetrachloro-1,2-difluoroethane	76-12-0	500	4,170
S	1,1,2,2-Tetrachloroethane	79-34-5	5	35
	Tetrachloroethylene	See Perchloroethylene		
	Tetrachloromethane	See Carbon tetrachloride		
S	Tetrachloronaphthalene	1335-88-2	---	2
S	Tetraethyl lead (as Pb)	78-00-2	---	0.075 ^a
	Tetrahydrofuran	109-99-9	200	590
S	Tetramethyl lead (TML)(as Pb)	75-74-1	---	0.150
S	Tetramethyl succinonitrile	3333-52-6	0.5	3
	Tetranitromethane	509-14-8	1	8
S	Tetryl (2,4,6-trinitrophenylmethyl-nitramine)	479-45-8	---	1.5
S	Thallium, soluble compounds (as Tl)	7440-28-0	---	0.1
	Thiram	137-26-8	---	5
	Tin			
	Inorganic compounds, except SnH ₄ and SnO ₂	7440-31-5	---	2
	Organic compounds	7440-31-5	---	0.1
	Oxide	21651-19-4	Inert particulate	
	Titanium dioxide	13463-67-7	Inert particulate	
	Toluene (toluol)	108-88-3	200	750
C	Toluene-2,4-diisocyanate	584-84-9	0.02	0.14
S	o-Toluidine	95-53-4	5	22

TABLE 6
MAXIMUM ALLOWABLE CONCENTRATIONS FOR SUBSTANCES; Q TO Z

SUBSTANCE	CAS No. ¹	MAC/Ceiling/STEL		
		ppm	mg/m ³	
Toxaphene	See Chlorinated camphene			
Tributyl phosphate	126-73-8	---	5	
1,1,1-Trichloroethane	See Methyl chloroform			
S 1,1,2-Trichloroethane	79-00-5	10	45	
Trichloroethylene	79-01-6	100	535	
Trichloromethane	See Chloroform			
S Trichloronaphthalene	1321-65-9	---	5	
1,2,3-Trichloropropane	96-18-4	50	300	
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	1,000	7,600	
Triethylamine	121-44-8	25	100	
Trifluoromonobromomethane	75-63-8	1,000	6,100	
Trimethyl benzene	25551-13-7	25	120	
2,4,6-Trinitrophenol	See Picric acid			
2,4,6-Trinitrophenylmethylnitramine	See Tetryl			
S Trinitrotoluene	118-96-7	---	1.5	
Triorthocresyl phosphate	78-30-8	---	0.1	
Triphenyl phosphate	115-86-6	---	3	
Tungsten and compounds (as W)				
	Insoluble	7440-33-7	---	5
	Soluble		---	1
Turpentine	8006-64-2	100	560	
Uranium (natural) soluble and insoluble compounds (as U)	7440-61-1	---	0.2	
C Vanadium				
	(V ₂ O ₅ dust)	1314-62-1	---	0.5
	(V ₂ O ₅ fume)		---	0.1
Vinyl benzene	See Styrene			
C Vinyl chloride	See OH 302 Vinyl Chloride*			
Vinyl cyanide	See Acrylonitrile			
Vinyl toluene	25013-15-4	100	480	
Warfarin	81-81-2	---	0.1	

TABLE 6 MAXIMUM ALLOWABLE CONCENTRATIONS FOR SUBSTANCES; Q TO Z				
SUBSTANCE		CAS No. ¹	MAC/Ceiling/STEL	
			ppm	mg/m ³
	Xylene (xylol)	1330-20-7	100	435
S	Xylidine	1300-73-8	5	25
	Yttrium	7440-65-5	---	1
	Zinc chloride fume	7646-85-7	---	1
	Zinc oxide fume	1314-13-2	---	5
	Zirconium compounds (as Zr)	7440-67-7	---	5
1	The CAS number is for information only. Enforcement is based on the substance name. For an entry covering more than 1 metal compound measured as the metal, the CAS number for the metal is given - not the CAS number for the individual compounds.			
A	See R 325.60154(2)(a).			
B	See R 325.60154(2)(b).			
C	See R 325.60154(2)(c).			
STEL	See R 325.60154(2)(d)			
^a	The 1970 ACGIH standard for Tetraethyl lead is 0.100 mg/m ³ .			
*	Caution--these rules contain extensive requirements for exposure to these substances.			
**	See Table 7 for the exposure limit for any operations or sectors where the exposure limit in OH 690 is stayed or is otherwise not in effect.			
All MIOSHA Occupational Health (OH) Standards shown in this table are referenced in R 325.60151a.				

History: 2002 AACS; 2013 AACS; 2017 AACS.

R 325.60161 Maximum allowable concentrations for mineral dusts.

Rule 11. Table 7 for mineral dusts, are as follows:

TABLE 7 MAXIMUM ALLOWABLE CONCENTRATIONS FOR MINERAL DUSTS				
SUBSTANCE		CAS No. ¹	MAC	
			mppcf	mg/m ³
Silica				
Crystalline *				
	Quartz (respirable)	14808-60-7	<u>250</u>	<u>10 mg/m³</u>

TABLE 7
MAXIMUM ALLOWABLE CONCENTRATIONS FOR MINERAL DUSTS

SUBSTANCE	CAS No. ¹	MAC																						
		mppcf	mg/m ³																					
Cristobalite	14464-46-1	% SiO ₂ +5	%SiO ₂ +2																					
Amorphous, including natural diatomaceous earth	61790-53-2	20	<u>80 mg/m³</u> %SiO ₂																					
Silicates (less than 1% crystalline silica)																								
Asbestos, all types	See OH 602 Asbestos Standards for Construction																							
Mica	12001-26-2	20																						
Portland cement	65997-15-1	50																						
Soapstone	–	20																						
Talc (non-asbestiform)	14807-96-6	20																						
Talc (fibrous)	See OH 602 Asbestos Standards for Construction																							
Tremolite	See OH 602 Asbestos Standards for Construction																							
Graphite (natural)	7782-42-5	15																						
Inert or nuisance particles **		50 of total dust less than 1% SiO ₂ (or 15 mg/m ³ , whichever is the smaller)																						
*	The percentage of crystalline silica, SiO ₂ , in the formula is the amount determined from airborne samples. Note: This MAC applies to any operations or sectors for which the respirable crystalline silica standard, OH 690, is stayed or otherwise is not in effect.																							
**	The following are some examples of inert or nuisance particulates when toxic impurities are not present; e.g. quartz less than 1%. <table border="0" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%; vertical-align: top;">Alundum (Al₂O₃)</td> <td style="width: 33%; vertical-align: top;">Gypsum</td> <td style="width: 33%; vertical-align: top;">Rouge</td> </tr> <tr> <td style="vertical-align: top;">Calcium carbonate</td> <td style="vertical-align: top;">Limestone</td> <td style="vertical-align: top;">Silicon carbide</td> </tr> <tr> <td style="vertical-align: top;">Cellulose</td> <td style="vertical-align: top;">Magnesite</td> <td style="vertical-align: top;">Starch</td> </tr> <tr> <td style="vertical-align: top;">Corundum (Al₂O₃)</td> <td style="vertical-align: top;">Marble</td> <td style="vertical-align: top;">Sucrose</td> </tr> <tr> <td style="vertical-align: top;">Emery</td> <td style="vertical-align: top;">Pentaerythritol</td> <td style="vertical-align: top;">Tin oxide</td> </tr> <tr> <td style="vertical-align: top;">Glycerine mist</td> <td style="vertical-align: top;">Plaster of Paris</td> <td style="vertical-align: top;">Titanium dioxide</td> </tr> <tr> <td style="vertical-align: top;">Graphite (synthetic)</td> <td style="vertical-align: top;">Portland cement</td> <td style="vertical-align: top;">Vegetable oil mists (except castor, cashew nut, or similar irritant oils)</td> </tr> </table>			Alundum (Al ₂ O ₃)	Gypsum	Rouge	Calcium carbonate	Limestone	Silicon carbide	Cellulose	Magnesite	Starch	Corundum (Al ₂ O ₃)	Marble	Sucrose	Emery	Pentaerythritol	Tin oxide	Glycerine mist	Plaster of Paris	Titanium dioxide	Graphite (synthetic)	Portland cement	Vegetable oil mists (except castor, cashew nut, or similar irritant oils)
Alundum (Al ₂ O ₃)	Gypsum	Rouge																						
Calcium carbonate	Limestone	Silicon carbide																						
Cellulose	Magnesite	Starch																						
Corundum (Al ₂ O ₃)	Marble	Sucrose																						
Emery	Pentaerythritol	Tin oxide																						
Glycerine mist	Plaster of Paris	Titanium dioxide																						
Graphite (synthetic)	Portland cement	Vegetable oil mists (except castor, cashew nut, or similar irritant oils)																						
1	The CAS number is for information only. Enforcement is based on the substance name. For an entry covering more than 1 metal compound measured as the metal, the CAS number for the metal is given - not the CAS number for the individual compounds.																							
All MIOSHA Occupational Health (OH) Standards shown in this table are referenced in R 325.60151a.																								

History: 2002 AACS; 2013 AACS; 2017 AACS.