Oregon OSHA Proposes Changes in Division 2, General Industry, and Division 3, Construction to Silica and Corrections to Air Contaminants

October 2007

New text to be adopted/added is in **bold and underlined**.

Text to be repealed/removed is in [~~brackets with line through~~].

Text in **bold** only, show substances that the Oregon Permissible Exposure Limits (PELs) are different than the federal limits.

Division 2/Z, Table Z-1 Changes

*** Only the substances with proposed changes are shown here. ***

2-Acetylaminoflourine	53-96-3	(C)	(See 1910.10[~~14~~]**03**)	
4-Aminodiphenyl	92-67-1		(See 1910.10[~~11~~]**03**)	
Arsenic, Inorganic Compounds (as As)	7440-38-2		**0.01** (See 1910.1018)	
Benzidine	92-87-5		(See 1910.10[~~10~~]**03**)	
Cadmium dust and fume (as Cd)	7440-43-9	(See 1910.1027, 1926.1127 and Division 4) **0.005**		
~~[Calcium arsenate~~	~~7778-44-1~~	~~—~~	~~1]~~	
bis-Chloromethyl ether	542-88-1		(See 1910.100[~~8~~]**3**)	
Chloromethyl methyl ether	107-30-2		(See 1910.100[~~6~~]**3**)	
Cyanide**s** (as CN)		—	5	X

Dibrom®	**300-76-5**	**—**	**3**	
1,2-Dibromo-3-chloropropane (DBCP)	96-12-8	**0.001**	(See 1910.1044)	
3,3-Dichlorobenzidine	91-94-1		(See 1910.100[~~7~~]**3**)	X
Dicyclohexylmethane 4,4'-diisocyanate (hydrogenated MDI, see Oregon Table Z-2 (Diisocyanates)	**5124-30-1**			
Dihydroxybenzene, see Hydro[-]quinone				
4-Dimethylaminoazobenzene	60-11-7		(See 1910.10[~~15~~]**03**)	
Dinitrobenzene (all isomers) (ortho) (meta) (para)	 528-2[8]**9**-0 99-65-0 100-25-4		1	X
Diphenylmethane diisocyanate (MDI), see Oregon Table Z-2 (Diisocyanates)				
Ethyl alcohol (ethanol)	64-17-5	1,000	1,9[~~9~~]**0**0	
Ethylenimine	151-56-4		(See 1910.10[~~12~~]**03**)	
Ethylene oxide	75-21-8	**1**	(See 1910.1047)	
Formaldehyde	50-00-0	**0.75**	(See 1910.1048)	
Hexamethylene diisocyanate (HDI), see Oregon Table Z-2 (Diisocyanates)	**822-06-0**			
Isophorone diisocyanate (IPDI), see Oregon Table Z-2 (Diisocyanates)	**4098-71-9**			
Lead, inorganic (as Pb)	7439-92-1	(See 1910.1025 & 1926.62) **0.05**		
Lead arsenate	7784-40-9	(See 1910.1018)	**0.01**	
Methyl Chloromethyl ether			(See 1910.100[~~6~~]**3**)	
Methylene bisphenyl isocyanate (MDI)	**101-68-8**	**(See Oregon Table Z-2 (diisocyanates)**		
Methylenedianiline (MDA)		(See 1910.1050 & 1926.60) **0.01**		
Methylene Chloride	75-09-2	**25**	(See [~~Oregon Table Z-2~~] **1910.1052**)	

alpha-Naphthylamine	134-32-7		(See 1910.100[~~4~~]**3**)	
beta-Naphthylamine	91-59-8		(See 1910.100[~~9~~]**3**)	
Nicotine	**54-11-5**	**0.075**	**0.5**	**X**
p-Nitroaniline	100-01-6	1	6	**X**
N-Nitrosodimethylamine			(See 1910.10[~~16~~]**03**)	
Osmium tetroxide (as Os)	20816-12-0	[~~0.0002~~]	0.002	
Perchloroethylene (tetrachloro[-]ethylene)	127-18-4		(See Oregon Table Z-2)	
Phosdrin (Mevinphos®)	7786-34-7	[~~0.01~~]	0.1	X
Beta-Propiolactone	57-57-8		(See 1910.10[~~13~~]**03**)	
Propargyl alcohol	**107-19-7**	**1**	**—**	**X**
Silica			**(See Oregon Table Z-3)**	
Thiram	137-26-8		(See 437-002-0373) **0.15**	
Toluene diisocyanate (TDI), See Oregon Table Z-2 (Diisocyanates)	**584-84-9**			
Wood Dust (non-allergenic)		**—**	**10**	

Division 2, Table Z-2

*** Only the substances with proposed changes are shown here. ***

~~[Methylene chloride~~	~~(See 1910.1052)]~~				

OREGON TABLE Z-3 - MINERAL DUSTS		
Substance	**mppcf (a)**	**mg/m 3**
Silica:	$\left[\frac{250^{(b)}}{\%SiO_2 + 5}\right]$	$\left[\frac{10\ mg/m^{3(e)}}{\%SiO_2 + 2}\right]$
Crystalline		
Quartz (respirable)		**0.05**
Cristobalite (respirable)		**0.05**
Quartz (total dust)	.....	$\frac{30\ mg/m^{3(e)}}{\%SiO_2 + 2}$
Cristobalite: Use 1/2 the value calculated from the count or mass formulae for quartz.		
Tridymite: Use 1/2 the value calculated from the formulae for quartz.		
Amorphous, including natural diatomaceous earth	20	$\frac{80\ mg/m^{3(e)}}{\%SiO_2}$
Silicates (less than 1% crystalline silica):		
Mica	20	
Soapstone	20	
Talc (not containing asbestos)	20	
Talc (containing asbestos) Use asbestos limit.	**20(c)**	
Tremolite, asbestiform (see OAR 437, Div. 2/Z, 1910.1001, Asbestos).		
Portland cement	50	
Graphite (Natural)	[~~15~~]	**5mg/m^3**
Coal Dust: Respirable fraction less than 5% SiO_2)		2.4 mg/m$^{3[0](f)}$
Coal Dust: Respirable fraction greater than 5% SiO_2)		$\frac{10\ mg/m^{3(e)(f)}}{\%SiO_2 + 2}$
Inert or Nuisance Dust: (d)		
Respirable fraction	[~~10~~]	5 mg/m^3
Total dust	[~~50~~]	10 mg/m^3

NOTE: Bold print identifies substances for which the Oregon Permissible Exposure Limits (PELs) are different than the federal limits.

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

FOOTNOTES:

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

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

(c) Containing less than 1% quartz; if 1% quartz or more, use quartz limit.

(d) All inert or nuisance dusts, whether mineral, inorganic, or organic, not listed specifically by substance name are covered by this limit, which is the same as the Particulates Not Otherwise Regulated (PNOR) limit in Oregon Table Z-1.

~~[(e) 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:~~]

~~Aerodynamic Diameter (Unit Density Sphere)~~	~~Percent Passing Selector~~
~~2~~	~~90~~
~~2.5~~	~~75~~
~~3.5~~	~~50~~
~~5.0~~	~~25~~
~~10~~	~~0~~

]

(e) **The ISO/CEN/ACGIH definition for this respirable particulate mass (RPM) is :**

$$\text{Collection efficiency} = 0.5\left(1 + e^{-0.06\, d_{ae}}\right)\left(1 - F(x)\right)$$

d_{ae} = aerodynamic diameter of the particle in micrometers
Γ = 4.25 micrometers
Σ = 1.5
F(X) = the cumulative probability function of the standardized normal variable x and

$$X = \frac{\ln\left(d_{ae}/\Gamma\right)}{\ln(\Sigma)}$$

With this particle size distribution 50 % of the 4 micrometer particles pass the size selector. This distribution is displayed in the following table.

Aerodynamic Diameter(μm)	Percent Passing Size Selector
1	97
2	91
3	74
4	50
5	30
6	17
7	9
8	5
9	3
10	1

(f) The measurements under this note refer to the use of an AEC (now NRC) instrument. If the respirable fraction of coal dust is determined with a MRE the figure corresponding to that of 2.4 mg/m^3 in the table for coal dust is 4.5 mg/m^3.

Division 3/Z, Table Z-1 Changes

*** Only the substances with proposed changes are shown here. ***

2-Acetylaminoflourine	53-96-3		(See 1910.10[~~14~~]**03**)	
alpha Alumina **Total Dust** **Respirable Fraction**	**1344-28-1**	 — —	 **10** **5**	
Aluminum Metal Dust **Total Dust** **Respirable Fraction**	**7429-90-5**	 — —	 **10** **5**	
4-Aminodiphenyl	92-67-1		(See 1910.10[~~11~~]**03**)	
Ammonium sulfamate **Total Dust** **Respirable Fraction**	**7773-06-0**	 — —	 **10** **5**	
Arsenic Inorganic Compounds (as As)	7440-38-2		(See 1910.1018) **0.01**	
Benzidine	92-87-5		(See 1910.10[~~10~~]**03**)	
Bismuth telluride (undoped) **Total Dust** **Respirable Fraction**	**1304-82-1**	 — —	 **10** **5**	
2-Butanone ([~~MEK~~] **Methyl Ethyl Ketone**)	78-93-3	200	590	
Cadmium dust and fume (as Cd)	7440-43-9	(See 1910.1027, 1926.1127 and Division 4) **0.005**		
~~[Calcium arsenate~~	~~7778-44-1~~	~~—~~	~~1]~~	
Calcium carbonate **Total Dust** **Respirable Fraction**	**1317-65-3**	 — —	 **10** **5**	
Calcium hydroxide **Total Dust** **Respirable Fraction**	**1305-62-0**	 — —	 **10** **5**	
Calcium silicate **Total Dust** **Respirable Fraction**	**1344-95-2**	 — —	 **10** **5**	

Calcium sulfate **Total Dust** **Respirable Fraction**	**7778-18-9**	 **—** **—**	 **10** **5**	
Cellulose **Total Dust** **Respirable Fraction**	**9006-34-6**	 **—** **—**	 **10** **5**	
2-Chloro-6-(trichloromethyl) pyridine **Total Dust** **Respirable Fraction**	**1929-82-4**	 **—** **—**	 **10** **5**	
Clopidol **Total Dust** **Respirable Fraction**	**2971-90-6**	 **—** **—**	 **10** **5**	
Crag® herbicide (Sesone) **Total Dust** **Respirable Fraction**	**136-78-7**	 **—** **—**	 **10** **5**	
Dibrom®	**300-76-5**	**—**	**3**	
1,2-Dibromo-3-chloropropane **(DBCP)**	96-12-8	**0.001**	(See 1910.1044)	
Dicyclohexylmethane 4,4'-diisocyanate (hydrogenated MDI, see Oregon Table Z-2 (Diisocyanates)	**5124-30-1**			
Dicyclopentadienyl iron **Total Dust** **Respirable Fraction**	**102-54-5**	 **—** **—**	 **10** **5**	
Diphenylmethane diisocyanate (MDI), see Oregon Table Z-2 (Diisocyanates)				
Emery **Total Dust** **Respirable Fraction**	**12415-34-8**	 **—** **—**	 **10** **5**	
Formaldehyde	50-00-0	**0.75**	(See 1910.1048)	
Glycerin (mist) **Total Dust** **Respirable Fraction**	**56-81-5**	 **—** **—**	 **10** **5**	
Graphite (Synthetic) **Total Dust** **Respirable Fraction**	**7782-42-5**	 **—** **—**	 **10** **5**	
Gypsum **Total Dust** **Respirable Fraction**	**13397-24-5**	 **—** **—**	 **10** **5**	

Hexamethylene diisocyanate (HDI), see Oregon Table Z-2 (Diisocyanates)	**822-06-01**			
1,6 Hexamethylene diisocyanate Based Adduct, see Oregon Table Z-2 (Diisocyanates)				
Isophorone diisocyanate (IPDI), see Oregon Table Z-2 (Diisocyanates)	**4098-71-9**			
Kaolin **Total Dust** **Respirable Fraction**	**1332-58-7**	 **—** **—**	 **10** **5**	
Lead arsenate	7784-40-9	(See 1910.1018)	**0.01**	
Limestone **Total Dust** **Respirable Fraction**	**1317-65-3**	 **—** **—**	 **10** **5**	
Magnesite **Total Dust** **Respirable Fraction**	**546-93-0**	 **—** **—**	 **10** **5**	
Marble **Total Dust** **Respirable Fraction**	**1317-65-3**	 **—** **—**	 **10** **5**	
Methylene bisphenyl isocyanate (MDI)	**101-68-8**	**(See Oregon Table Z-2 (diisocyanates)**		
Methylenedianiline (MDA)		(See 1910.1050 & 1926.60) **0.01**		
Methylene Chloride	75-09-2	**25**	(See [~~Oregon Table Z-2~~] **1910.1052**)	
Nicotine	**54-11-5**	**0.075**	**0.5**	**X**
Osmium tetroxide (as Os)	20816-12-0	[~~0.0002~~]	0.002	
Particulates not otherwise regulated (PNOR)[f] **Total Dust** **Respirable Fraction**		 **—** **—**	 **10** **5**	
Pentaerythritol **Total Dust** **Respirable Fraction**	**115-77-5**	 **—** **—**	 **10** **5**	

Perlite	**93763-70-3**			
Total Dust		**—**	**10**	
Respirable Fraction		**—**	**5**	
Phosdrin (Mevinphos®)	7786-34-7	[~~0.01~~]	0.1	X
Picloram	**1918-02-1**			
Total Dust		**—**	**10**	
Respirable Fraction		**—**	**5**	
Plaster of Paris	**26499-65-0**			
Total Dust		**—**	**10**	
Respirable Fraction		**—**	**5**	
Portland Cement	**65997-15-1**			
Total Dust		**—**	**10**	
Respirable Fraction		**—**	**5**	
Propargyl alcohol	**107-19-7**	**1**	**—**	**X**
Rouge				
Total Dust		**—**	**10**	
Respirable Fraction		**—**	**5**	
Silica			**(See Oregon Table Z-3)**	
Silicon	**7440-21-3**			
Total Dust		**—**	**10**	
Respirable Fraction		**—**	**5**	
Silicon carbide	**409-21-2**			
Total Dust		**—**	**10**	
Respirable Fraction		**—**	**5**	
Starch	**9005-25-8**			
Total Dust		**—**	**10**	
Respirable Fraction		**—**	**5**	
Sucrose	**57-50-1**			
Total Dust		**—**	**10**	
Respirable Fraction		**—**	**5**	
Temephos	**3383-96-8**			
Total Dust		**—**	**10**	
Respirable Fraction		**—**	**5**	
Thallium (soluble compounds) as T[~~1~~]**1**	7440-28-0	—	0.1	X
4,4'-Thiobis (6-tert, Butyl-m-cresol)	**96-69-5**			
Total Dust		**—**	**10**	
Respirable Fraction		**—**	**5**	

Thiram	137-26-8		(See 437-002-0373) **0.15**	
Toluene diisocyanate (TDI), See Oregon Table Z-2 (Diisocyanates)	**584-84-9**			
Vegetable oil mist **Total Dust** **Respirable Fraction**		 **—** **—**	 **10** **5**	
Wood Dust (non-allergenic)		**—**	**10**	
Zinc oxide **Total Dust** **Respirable Fraction**	**1314-13-2**	 **—** **—**	 **10** **5**	
Zinc [~~state~~] stearate **Total Dust** **Respirable Fraction**	**557-05-1**	 **—** **—**	 **10** **5**	

Division 3/Z, Table Z-2

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Carbon disulfide (Z37.3-1968)	20 ppm	30 ppm	100 ppm	30 min.	**X**
Ethylene dibromide (Z37.31-1970)	20 ppm	30 ppm	50 ppm	5 min.	**X**
Mercury (Z37.8-1971)	**0.05 mg/m^3**	**0.1 mg/m^3**			**X**
~~[Methylene chloride (Z37.3-1969)~~	~~(See 1910.1052)]~~				
Organo (alkyl) mercury (Z37.30-1969)	**0.001 mg/m^3**	**0.01 mg/m^3**			**X**
Toluene (Z37.12-1967)	**100 ppm**	**300 ppm**	**500 ppm**	**10 min.**	

Division 3

OREGON TABLE Z-3 – MINERAL DUSTS		
Substance	**mppcf [(a)]**	**mg/m ^{3}**
Silica:	$\left[\frac{250^{(b)}}{\%SiO_2+5}\right]$	$\left[\frac{10mg/m^{3(e)}}{\%SiO_2+2}\right]$
Crystalline		
Quartz (respirable) ……		**0.05**
Cristobalite (respirable)		**0.05**
Quartz (total dust) …….		$\frac{30mg/m^{3(e)}}{\%SiO_2+2}$
Cristobalite: Use 1/2 the value calculated from the count or mass formulae for quartz.		
Tridymite: Use 1/2 the value calculated from the formulae for quartz.		
Amorphous, including natural diatomaceous earth …….	20	$\frac{80mg/m^3}{\%SiO_2}$
Silicates (less than 1% crystalline silica):		
Mica …….	20	
Soapstone ……...	20	
Talc (not containing asbestos) …….	20 [(c)]	
Talc (containing asbestos) Use asbestos limit.	20	
Tremolite, asbestiform (see OAR 437, Div. 2/Z, 1910.1001, Asbestos).		
Portland cement …….	50	
Graphite (Natural) …….	[~~15~~]	**5 mg/m^3**
Coal Dust:		
Respirable fraction less than 5% SiO_2) ……..		2.4 mg/m^3 [)(f)]
Coal Dust:		$\frac{10mg/m^{3(e)}(\mathbf{f})}{\%SiO_2+2}$
Respirable fraction greater than 5% SiO_2) ……		
Inert or Nuisance Dust: [(d)]		
Respirable fraction ……..		5 mg/m^3
Total dust ……...	[~~50~~]	10 mg/m^3

NOTE: Bold print identifies substances for which the Oregon Permissible Exposure Limits (PELs) are different than the federal limits.

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

FOOTNOTES:

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[ ]

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$$\text{Collection efficiency} = 0.5\left(1 + e^{-0.06\, d_{ae}}\right)\left(1 - F(x)\right)$$

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Γ = 4.25 micrometers
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F(X) = the cumulative probability function of the standardized normal variable x and

$$X = \frac{\ln\left(d_{ae} / \Gamma\right)}{\ln(\Sigma)}$$

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9	3
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(f) The measurements under this note refer to the use of an AEC (now NRC) instrument. If the respirable fraction of coal dust is determined with a MRE the figure corresponding to that of 2.4 mg/m^3 in the table for coal dust is 4.5 mg/m^3.