

Oregon OSHA Proposed Changes Air Contaminants Table Z-3, Mineral Dusts June 2006

The following is the **current** Table Z-3 portions proposed to be amended:

OREGON TABLE Z-3 - MINERAL DUSTS		
Substance	mppcf (a)	mg/m ³
Silica:	250 ^(b)	10 mg / m ^{3(e)}
Crystalline		
Quartz (respirable).....	%SiO ₂ + 5	%SiO ₂ + 2
Quartz (total dust).....	30 mg / m ^{3(e)} %SiO ₂ + 2

(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

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/m³ in the table for coal dust is 4.5 mg/m³.

The following Table Z-3 portions show the **proposed** changes in **bold and underscore**.

OREGON TABLE Z-3 - MINERAL DUSTS		
Substance	mppcf (a)	mg/m ³
Silica:		
Crystalline		
Quartz (respirable).....		<u>0.05</u>
<u>Cristobalite (respirable)</u>		<u>0.05</u>
Quartz (total dust).....	$\frac{30 \text{ mg/m}^3 \text{ (e)}}{\% \text{SiO}_2 + 2}$

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

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

d_{ae} = aerodynamic diameter of the particle in micrometers

$\Gamma = 4.25$ micrometers

$\Sigma = 1.5$

$F(X)$ = the cumulative probability function of the standardized normal variable x and

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

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

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