

TLVs®
 Threshold Limit Values
 for
 Chemical Substances
 and
 Physical Agents
 in the
 Workroom Environment
 with
 Intended Changes
 for
 1973

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monitoring is essential for personnel control.

Radioactivity: For permissible concentrations of radioisotopes in air, see U.S. Department of Commerce, National Bureau of Standards Handbook 69, "Maximum Permissible Body Burdens and Maximum Permissible Concentrations of Radionuclides in Air and in Water for Occupational Exposure," June 5, 1969. Also, see U.S. Department of Commerce National Bureau of Standards, Handbook 59, "Permissible Dose from External Sources of Ionizing Radiation," September 24, 1954, and addendum of April 15, 1958. A report, Basic Radiation Protection Criteria, published by the National Committee on Radiation Protection, revises and modernizes the concept of the NCRP standards of 1954, 1957 and 1958; obtainable as NCRP Rept. No. 39, P.O. Box 4867, Washington, D.C. 20008.

MINERAL DUSTS

Substance	m.p.p.c.f. ^o
SILICA, SiO₂	
Crystalline	
Quartz	TLV in mppcf: 300 ^o $\frac{30 \text{ mg/m}^3}{\% \text{ quartz} + 10}$ TLV for respirable dust in mg/m ³ : $\frac{10 \text{ mg/m}^{3*}}{\% \text{ Respirable quartz} + 2}$
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TLV for "total dust," respirable and nonrespirable:

$$\frac{30 \text{ mg/m}^3}{\% \text{ quartz} + 3}$$

Cristobalite	Use one-half the value calculated from the count or mass formulae for quartz.
Tridymite	Use one-half the value calculated from formulae for quartz.
Silica, fused	Use quartz formulae.
Amorphous, including natural diatomaceous earth	20

SILICATES (< 1% quartz)

**Asbestos, all forms	—
Mica	20
*Perlite	30
Portland Cement	30
Soapstone	20
Talc (non-asbestiform)	20
Talc (fibrous) use asbestos limit	—
Tremolite (see Asbestos)	—
Graphite (natural)	15
*1973 Addition.	
**See Notice of Intended Changes for Mineral Dusts.	

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***COAL DUST**

(bituminous). 2 mg/m³ (respirable dust^p) fraction < 5% quartz).
If > 5% quartz use respirable mass formula.

NUISANCE PARTICULATES

(see Appendix E)

30 m.p.p.c.f. or 10 mg/m³
of total dust < 1% quartz

Conversion factors

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

- i) Millions of particles per cubic foot of air, based on impinger samples counted by light-field techniques.
- j) The percentage of quartz in the formula is the amount determined from airborne samples, except in those instances in which other methods have been shown to be applicable.
- k) 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 (μm) (unit density sphere)	% passing selector
≤ 2	90
2.5	75
3.5	50
5.0	25
10	0

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- l) containing <1% quartz; if quartz content > 1%, use formulae for quartz.

p) see Page 39.

*1973 Addition.

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tional Committee on Radiation Protection, revises and modernizes the concept of the NCRP standards of 1954, 1957 and 1958; obtainable as NCRP Rept. No. 39, P.O. Box 4867, Washington, D.C. 20008.

MINERAL DUSTS

Substance	m.p.p.c.f. ¹⁾
SILICA	
Cristobalite, Crystalline.....	Use one-half the value calculated from the count or mass formulae for quartz.
Amorphous, including natural diatomaceous earth.....	20
Quartz	$\frac{\text{TLV in mppcf: } 300^2)}{\% \text{ quartz} + 10}$ $\frac{\text{TLV for respirable dust in mg/m}^3: 10 \text{ mg/m}^3^3)}{\% \text{ Respirable quartz} + 2}$ $\frac{\text{TLV for "total dust," respirable and nonrespirable: } 30 \text{ mg/m}^3}{\% \text{ quartz} + 3}$
Silica, fused Tridymite	Use quartz formulae. Use one-half the value calculated from formulae for quartz. 30

MINERAL DUSTS

Substance	m.p.p.c.f. ¹⁾
SILICATES (< 1% quartz)	
**Asbestos, all types.	—
Mica.....	20
Perlite.....	30
Portland Cement..	30
Soapstone.....	20
Talc (non-asbestiform).....	20
Talc (fibrous) use asbestos limit....	—
Tremolite (see Talc, fibrous).....	—
Graphite (natural).	15

NUISANCE

PARTICULATES 30 mp.p.c.f. or 10 mg/m³ of total dust < 1% quartz (see Appendix E)

Conversion factors

$\text{mppcf} \times 35.3 = \text{million particles per cubic meter}$
 $= \text{particles per c.c.}$

- i) Millions of particles per cubic foot of air, based on impinger samples counted by light-field technics.
- j) The percentage of quartz in the formula is the amount determined from airborne samples, except in those instances in which other methods have been shown to be applicable.

**See Notice of Intended Changes for Mineral Dusts.

- k) 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 (μm) (unit density sphere)	% passing selector
≤ 2	90
2.5	75
3.5	50
5.0	25
10	0

- l) containing $<1\%$ quartz; if quartz content $> 1\%$, use formulae for quartz.

NOTICE OF INTENDED CHANGES (for 1972)

These substances, with their corresponding values, comprise those for which either a limit has been proposed for the first time, or for which a change in the "Adopted" listing has been proposed. In both cases, the proposed limits should be considered trial limits that will remain in the listing for a period of at least two years. If, after two years no evidence comes to light that questions the appropriateness of the values herein, the values will be reconsidered for the "Adopted" list. Documentation is available for each of these substances.

Substance	ppm ^{a)}	mg/M ^{3b)}
Acetaldehyde.....	100	180
C Acetic anhydride.....	5	20
Ammonia.....	25	18
+ Baygon.....	—	0.5
Bismuth telluride.....	—	10
Bismuth telluride (Se-doped).....	—	5
Butane.....	500	1,200
+ Caprolactam (2-Oxo-hexamethylenimine)		
Dust.....	—	1
Vapor.....	5	25
+ Carbofuran — Skin.....	—	0.05
Chloroform (trichloromethane).....	25	120
+ bis-Chloromethyl ether..	—	A ^{1b}
+ Chloromethyl ether.....	—	A ^{1b}

Capital letters refer to Appendices.
*1972 Revision or Addition.