

Annex

OCCUPATIONAL EXPOSURE VALUES ¹⁾ TWA ¹¹⁾ (mg/m³)

SUBSTANCE [CAS No.] ²⁾	ACGIH ³⁾ TLVs ⁴⁾	OSHA ⁵⁾ PELs ⁶⁾	NIOSH ⁷⁾ RELs ⁸⁾	DFG ⁹⁾ MAKs ¹⁰⁾
Aluminum [7429-90-5] metal and insoluble compounds	1 ¹²⁾	5 ¹²⁾	5 ¹²⁾	4 ¹³⁾ , [1,5 ¹²⁾]
Aluminum [7429-90-5] metal and insoluble compounds, total dust	---	15	10	---
Aluminum [7429-90-5] welding fumes, as Al	---	---	5	---
Aluminum oxide [1344-28-1]	---	5 ¹²⁾	---	4 ¹³⁾ , [1,5 ¹²⁾]
Aluminum oxide [1344-28-1], total dust	---	15	---	---
Boron oxide [1303-86-2]	10	---	10	---
Boron oxide [1303-86-2], total dust	---	15	---	---
Barium [7440-39-3] and soluble compounds, as Ba	0.5	0.5	0.5	---
Barium compounds, soluble, as Ba	---	---	---	0.5 ¹³⁾
Calcium oxide [1305-78-8]	2	5	2	1 ¹³⁾
Calcium carbonate [1317-65-3] (NIOSH : includes [471-34-1])	---	5 ¹²⁾	5 ¹²⁾	---
Calcium carbonate [1317-65-3], total dust	---	15	10	---
Cobalt [7440-48-4] and inorganic compounds, as Co	0.02	---	---	---
Cobalt [7440-48-4] and inorganic compounds, metal dust and fume, as Co	---	0.1	0.05	---
Chromium [7440-47-3] metal	0.5	1	0.5	---
Chromium [7440-47-3] (II) inorganic compounds, as Cr	---	0.5	0.5	---
Chromium [7440-47-3] (VI) compounds, as Cr (VI)	---	0.005	---	---
Chromium [7440-47-3] (III) inorganic compounds, as Cr	0.5	0.5	0.5	---
Chromium [7440-47-3] (VI) inorganic compounds, water-soluble, as Cr	0.05	---	0.0002	---
Chromium [7440-47-3] (VI) inorganic compounds, water-insoluble, as Cr	0.01	---	0.0002	---
Chromium [7440-47-3] (VI) inorganic compounds, water-soluble, as Cr (VI)	---	0.005	---	---
Chromium [7440-47-3] (VI) inorganic compounds, water-insoluble, as Cr (VI)	---	0.005	---	---
Copper [7440-50-8], fume, as Cu	0.2	0.1	0.1	---
Copper [7440-50-8], dusts and mists, as Cu	1	1	1	---
Copper [7440-50-8] and its inorganic compounds	---	---	---	0.01 ¹²⁾
Fluorides, as F	2.5	2.5	2.5	1 ¹³⁾
Iron oxide (Fe ₂ O ₃) [1309-37-1]	5 ¹²⁾	---	---	---
Iron oxide (Fe ₂ O ₃) [1309-37-1], fume	---	10	---	---
Iron oxide (Fe ₂ O ₃) [1309-37-1], dust and fume, as Fe	---	---	5	---
Magnesium oxide [1309-48-4]	10 ¹³⁾	---	---	4 ¹³⁾ , [1,5 ¹²⁾]
Magnesium oxide [1309-48-4], fume, total particulate	---	15	---	---
Manganese [7439-96-5] and inorganic compounds, as Mn	0.1 ¹³⁾ , [0.02 ¹²⁾]	---	1, [3 ¹⁴⁾]	0.2 ¹³⁾ , [0.02 ¹²⁾]
Manganese [7439-96-5], fume, as Mn	0.1 ¹³⁾ , [0.02 ¹²⁾]	5	1, [3 ¹⁴⁾]	0.2 ¹³⁾ , [0.02 ¹²⁾]
Molybdenum [7439-98-7] and soluble compounds, as Mo	0.5 ¹²⁾	5	---	---
Molybdenum [7439-98-7] and insoluble compounds, as Mo	10 ¹³⁾ , [3 ¹²⁾]	---	---	---
Molybdenum [7439-98-7] and insoluble compounds, total dust, as Mo	---	15	---	---
Nickel [7440-02-0], elemental	1.5 ¹³⁾	1	0.015	---
Nickel [7440-02-0] soluble compounds, as Ni (ACGIH : inorganic only)	0.1 ¹³⁾	1	0.015	---
Nickel [7440-02-0] insoluble compounds, as Ni (ACGIH : inorganic only)	0.2 ¹³⁾	1	0.015	---
Nickel [7440-02-0] compounds	---	---	0.015	---
Silica, amorphous, fused (DFG : includes [7699-41-4])	---	---	0.3 ¹²⁾	---
Silica, amorphous, fused, dust	---	A ¹²⁾¹⁵⁾	---	---
Silica, amorphous, fused, total dust	---	B ¹⁶⁾	---	---
Silica, crystalline, α-quartz	0.025 ¹²⁾	---	---	---
Silica, crystalline, α-quartz, dust	---	A ¹²⁾¹⁵⁾	0.05 ¹²⁾	---
Silica, crystalline, α-quartz, total dust	---	B ¹⁶⁾	---	---
Silicon [7440-21-3]	---	5 ¹²⁾	5 ¹²⁾	---
Silicon [7440-21-3], total dust	---	15	10	---
Tin [7440-31-5], metal	2	2	2	---
Tin [7440-31-5], oxide, as Sn	2	---	2	---
Tin [7440-31-5], oxide and inorganic compounds, except SnH ₄ , as Sn	2	---	2	---
Tin [7440-31-5], oxide and inorganic compounds, except oxide and SnH ₄ , as Sn	---	2	---	---
Tin [7440-31-5], organic compounds, as Sn	0.1, [0.2 ¹⁴⁾]	0.1	0.1	0.1 ¹³⁾
Tantalum [7440-25-7], metal	---	5	5, [10 ¹⁴⁾]	4 ¹³⁾ , [1,5 ¹²⁾]
Tantalum [7440-25-7] oxide, dust, as Ta	---	5	5, [10 ¹⁴⁾]	---
Titanium dioxide [13463-67-7]	10	---	---	---
Titanium dioxide [13463-67-7], total dust	---	15	---	---
Vanadium pentoxide [1314-62-1], as V	0.05 ¹²⁾	---	---	---
Ferrovandium [12604-58-9] dust	1, [3 ¹⁴⁾]	1	1, [3 ¹⁴⁾]	---
Tungsten [7440-33-7] and insoluble compounds, as W	5, [10 ¹⁴⁾]	---	5, [10 ¹⁴⁾]	---
Tungsten [7440-33-7], soluble compounds, as W	1, [3 ¹⁴⁾]	---	1, [3 ¹⁴⁾]	---
Zinc oxide [1314-13-2]	2 ¹²⁾ , [10 ¹²⁾¹⁴⁾]	5 ¹²⁾	---	0.1 ¹²⁾ , [2 ¹³⁾]
Zinc oxide [1314-13-2], total dust	---	15	---	---
Zinc oxide [1314-13-2], dust only	---	---	5	---
Zinc oxide [1314-13-2], fume	---	5	5, [10 ¹⁴⁾]	0.1 ¹²⁾ , [2 ¹³⁾]
Zirconium [7440-67-7]	5, [10 ¹⁴⁾]	---	---	---
Zirconium [7440-67-7] compounds, as Zr	5, [10 ¹⁴⁾]	5	5, [10 ¹⁴⁾]	---
Zirconium [7440-67-7] insoluble compounds	---	---	5, [10 ¹⁴⁾]	1 ¹³⁾
Zirconium [7440-67-7] soluble compounds	---	---	5, [10 ¹⁴⁾]	---

(Continued) OCCUPATIONAL EXPOSURE VALUES ¹⁾ TWA¹¹⁾ (ppm)

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Phenol [108-95-2]	5	5	5	---
Carbon monoxide [630-08-0]	25	50	35	30
Carbon dioxide [124-38-9]	5000, [30000 ^{14), 15)}	5000	5000, [30000 ¹⁴⁾	5000
Phosgene [75-44-5]	0.1	0.1	0.1	0.1
Hydrogen fluoride [7664-39-3] as F	0.5, [2 ¹⁴⁾	3	3	1
Nitric oxide [10102-43-9]	25	25	25	---
Nitrogen dioxide [10102-44-0]	0.2	---	1 ¹⁴⁾	0.5
Ozone [10028-15-6]	---	0.1	0.1 ¹⁴⁾	---
Heavy work	0.05	---	---	---
Moderate work	0.08	---	---	---
Light work	0.1	---	---	---
Light, moderate, or heavy workload (≤ 2 hours)	0.2	---	---	---
Phosphine [7803-51-2]	0.3, [1 ¹⁴⁾	0.3	0.3, [1 ¹⁴⁾	0.1

- 1) 2014 Guide to Occupational Exposure Values, ACGIH
- 2) Chemical Abstract Service Registry Number
- 3) American Conference of Governmental Industrial Hygienists
- 4) ACGIH Threshold Limit Values
- 5) U.S. Occupational Safety and Health Administration
- 6) OSHA Permissible Exposure Limits
- 7) U.S. National Institute for Occupational Safety and Health
- 8) NIOSH Recommended Exposure Limits
- 9) Deutsche Forschungsgemeinschaft
- 10) DFG Maximum Concentrations at the Workplace
- 11) Time-weighted average exposure concentration for a conventional 8-hour (TLV, PEL) or up to a 10-hour (REL) workday and a 40-hour workweek
- 12) Measured as respirable fraction of the aerosol.
- 13) Measured as inhalable fraction of the aerosol.
- 14) The concentration that shall not be exceeded during any part of the working exposure
- 15) $\frac{250\text{mppcf}}{\%SiO^2+5}$ or $\frac{10\text{mg}/\text{m}^3}{\%SiO^2+2}$
- 16) $\frac{30\text{mg}/\text{m}^3}{\%SiO^2+2}$