

Exposure Limits For Laboratory Chemicals

Below are airborne chemical concentration limits above which you can not legally be exposed at work. These limits are administered by the California Occupational Safety and Health Administration (Cal-OSHA). The materials listed here are a fraction of the total number (500+) of OSHA exposure limits – for the complete list, see: http://www.dir.ca.gov/Title8/5155table_ac1.html If workers have reason to believe they might be exposed any hazardous materials, contact EH&S, x-4899, or x-8243. All workers should strive to maintain their chemical exposures to as low as reasonably achievable at all times, regardless of the legal exposure limits. Given the volatility of these materials, they should always be used in a properly functioning fume hood, or glove box, or in completely-sealed systems. The “S” notation indicates material is also readily skin absorbed.

Chemical Abstracts Registry Number ^(a)	Skin ^(b)	Name	Permissible Exposure Limit ^(d)		Ceiling Limit ^(g)	Short-term Exposure Limit ^(o)	
			ppm ^(e)	mg/M ^{3(f)}		ppm ^(e)	mg/M ^{3(f)}
64197		Acetic acid	10	25	40 ppm	15	37
67641		Acetone	500	1200	3000 ppm	750	1780
75058	S	Acetonitrile	40	70		60	105
79061	S	Acrylamide	--	0.03			
7664417		Ammonia	25	18		35	27
62533	S	Aniline	2	7.6			
7440371		Argon	(h)				
		Arsenic and inorganic arsenic compounds	--	0.01			
71432	S	Benzene	1			5	--
7726956		Bromine	0.1	0.7	C		
7440439		Cadmium metal dust, as Cd		0.005			
630080		Carbon monoxide	25	29	200 ppm		
7782505		Chlorine	0.5	1.5		1	3
67663		Chloroform; trichloromethane	2	9.78			
110827		Cyclohexane	300	1,050			
287923		Cyclopentane	600	1,720			
75343		1,1-Dichloroethane	100	400			
68122	S	Dimethylformamide; DMF	10	30			
74840		Ethane	(h)				
141786		Ethyl acetate	400	1,400			
64175		Ethyl alcohol; ethanol	1,000	1,900			
74851		Ethylene	(h)				
60297		Ethyl ether	400	1,200		500	1500
50000		Formaldehyde	0.75	--		2	--
75127	S	Formamide	10	18			
64186		Formic acid	5	9		10	19
7440597		Helium	(h)				
142825		n-Heptane	400	1,600		500	2000
110543	S	n-Hexane	50	180			
1333740		Hydrogen	(h)				
10035106		Hydrogen bromide	3	10	C		

7647010		Hydrogen chloride; muriatic acid	5	7	C		
7664393		Hydrogen fluoride, as F	3	2.5		6	--
7722841		Hydrogen peroxide, as H ₂ O ₂	1	1.4			
7783064		Hydrogen sulfide	10	14	50 ppm	15	21
26675467		Isoflurane	2	15			
67630		Isopropyl alcohol	400	980		500	1225
7439976	S	Mercury, metallic and inorganic compounds as Hg	--	0.025	0.1 mg/M ³		
67561	S	Methyl alcohol; methanol	200	260	1000 ppm	250	325
75092		Methylene chloride; dichloromethane	25	87		125	435
7697372		Nitric acid	2	5		4	10
10102439		Nitric oxide	25	30			
7727379		Nitrogen	(h)				
75525		Nitromethane	2	5			
1321126,	S	Nitrotoluene	2	11			
111659		Octane	300	1,450		375	1800
8012951		Oil (mineral) mist, particulate		5			
20816120		Osmium tetroxide, as Os	0.0002	0.002		0.0006	0.006
10028156		Ozone	0.1	0.2		0.3	0.6
109660		Pentane	600	1,800			
127184		Perchloroethylene	25	170	300 ppm	100	685
108952	S	Phenol	5	19			
7664382		Phosphoric acid	--	1		--	3
1310583		Potassium hydroxide; caustic potash	--	2	C		
110861		Pyridine	5	15			
61790532		Silica, amorphous, total dust	-	6			
61790532		Silica, crystalline; quartz total dust	-	0.3			
1310732		Sodium hydroxide; caustic soda	--	2	C		
7664939		Sulfuric acid	--	1		--	3
109999		Tetrahydrofuran	200	590		250	735
108883	S	Toluene; toluol	50	188	500 ppm	150	560
76039		Trichloroacetic acid	1	5			
1330207		Xylene; xylol; dimethylbenzene	100	435	300 ppm	150	655

Footnotes to Table. Footnotes have been edited for clarity. For the complete Cal-OSHA Table and complete footnotes, see: http://www.dir.ca.gov/Title8/5155table_ac1.html (b) The substances designated by "S" in the skin notation column indicates material may be absorbed into the bloodstream through the skin, the mucous membranes and/or the eye, and contribute to the overall exposure. Appropriate protective clothing shall be provided for and used by employees as necessary; (d) Permissible Exposure Limit (PEL) = the maximum permitted 8-hour time-weighted average concentration of an airborne contaminant; (e) Parts of gas or vapor per million parts of air by volume at 25°C and 760mm Hg pressure; (f) Milligrams of substance per cubic meter of air at 25°C and 760mm Hg pressure; (g) Ceiling Limit = the maximum concentration of an airborne contaminant to which an employee may be exposed at any time. A numerical entry in this column represents a ceiling value in addition to the PEL values. A "C" notation means the value given in the PEL columns are also ceiling values; (h) A number of gases and vapors, when present in high concentrations, act primarily as asphyxiants without other adverse effects. A concentration limit is not included for each material because the limiting factor is the available oxygen. (Several of these materials present fire or explosion hazards.); (o) Short-Term Exposure Limit = a 15-minute time-weighted average airborne exposure which is not to be exceeded at any time during a workday even if the 8-hour time-weighted average is below the PEL.