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Solvent Data Table

EXPLANATION OF COLUMN HEADINGS

SOLVENT NAME AND SYNONYMS: Full entries are in bold type. Entries that are not bold refer you from a synonym to a full entry.

CAS NUMBER: an identification number assigned to each chemical. The hyphens in the numbers are sometimes left out.

FIRE HAZARD: Numbers in parentheses are the NFPA fire rating:

- (0) not flammable: will not burn
- (1) combustible liquid: able to catch fire if heated over 100 degrees F.
- (2) flammable liquid: can catch fire at ordinary room temperatures (100 degrees F. or less)
- (3) highly flammable
- (4) explosive



VOLATILITY RATING: Describes how quickly a liquid solvent will evaporate (how quickly it goes into the air as a vapor). The ratings are based on vapor pressure in millimeters of mercury (mmHg) at a warm room temperature (77 degrees F):

- Less than 1 mmHg: VERY LOW
- 1-10 mmHg: LOW
- 10-100 mmHg: MEDIUM
- 100-760 mmHg: HIGH
- More than 760 mmHg: Gas at room temperature.

One mmHg is very roughly equal to 1300 ppm at normal temperature and pressure.

LEGAL EXPOSURE LIMITS: These are Cal/OSHA's Permissible Exposure Limits; they are legal requirements. The "SKIN" notation means that skin contact must be prevented.

RECOMMENDED EXPOSURE LIMITS: Several organizations recommend voluntary standards for occupational exposures. Standards that are lower (more protective) than the OSHA PEL are listed here. Standards used in this table are:

- NIOSH: National Institute for Occupational Safety and Health (a federal government agency)
- HBEL: Health Based Exposure Levels recommended by the Health-Based Exposure Guidelines Committee (associated with the Santa Clara Center for Occupational Safety and Health)
- TLV: Threshold Limit Values recommended by the American Congress of Governmental Industrial Hygienists (ACGIH)

ODOR THRESHOLD: The smallest amount that most people can smell. Individuals vary greatly in the ability to detect solvents, so the odor threshold is given as a range. If the threshold is greater than the PEL, you could be overexposed without a warning odor. If the threshold is smaller than the PEL, you may smell the odor yet not be overexposed.

OVERALL TOXICITY RATING: Rates how poisonous the solvent is; this rating includes both immediate and long-term health effects.

SPECIAL HEALTH HAZARDS / OTHER INFORMATION: Unusual or special hazards to health. Because almost every solvent can cause dermatitis and affect the brain (central nervous system), these effects are not included in the table.

SPECIAL RESPIRATOR NOTES: Some limitations and warnings about using respirators for the solvent. Always get expert advice when selecting and using respirators.

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Solvent Name and Synonyms	CAS Number	Fire Hazard	Volatility	Legal Exposure Limits (Cal/OSHA)	Recommended Exposure Limit	Odor Threshold	Overall Toxicity Rating	Special Health Hazards / Other Information	Special Respirator Notes
cyclohexane	110-82-7	flammable	MEDIUM 99 mmHg	300 ppm 8-hr TWA		25-250 ppm	Not very toxic	Irritant.	
cyclohexanone	108-94-1	flammable	LOW 4 mmHg	25 ppm 8-hr TWA SKIN	HBEL 7 mg/m ³	1-10 ppm	Not very toxic	Irritant. Easily absorbed through skin.	
dichlorodifluoromethane (FC 12)	75-71-8	will not burn	Gas at room temp	1000 ppm 8-hr TWA 6200 ppm ceiling	HBEL 0.69 mg/m ³		Not very toxic	Extremely high concentrations can cause heart palpitations and heart failure at the time of exposure.	Not suitable for use with filter-type respirators due to inadequate warning properties.
1,1-dichloroethane (ethylidene chloride)	75-34-3	very flammable	HIGH 232 mmHg	100 ppm 8-hr TWA	NIOSH potential carcin, 100 ppm. HBEL 0.0032 mg/m ³		Moderately toxic	Damages kidneys and liver at very high exposure levels. Suspect cancer-causing agent, based on weak information.	
1,2-dichloroethane (ethylene dichloride)	107-06-2	flammable	MEDIUM 81 mmHg	1 ppm 8-hr TWA 2 ppm STEL 200 ppm ceiling	HBEL 0.0002 mg/m ³	88-880 ppm	Extremely toxic	Causes cancer in animals.	
1,1-dichloroethylene, see vinylidene chloride									
1,2-dichloroethylene (DCE)	540-59-0	flammable	HIGH 198-334 mmHg	200 ppm 8-hr TWA	HBEL 0.11 mg/m ³	17-170 ppm	Moderately toxic	Very high exposures can damage the liver, lungs, and heart.	
dichlorofluoromethane (FC 21)	75-43-4	will not burn		10 ppm 8-hr TWA			Highly toxic	Liver damage. Possible hazard to pregnancy at very high exposure levels. Harmful to ozone in the upper atmosphere.	
dichloromethane, see methylene chloride									
1,2-dichlorotetrafluoroethane (FC 114)	76-14-2	will not burn	Gas at room temp	1000 ppm 8-hr TWA			Not very toxic	Extremely high concentrations can cause heart palpitations and heart failure at the time of exposure.	Not suitable for use with filter-type respirators due to inadequate warning properties.
diethylene glycol butyl ether (DEGBE)	112-34-5	combustible	Very low <0.2 mmHg	no PEL			Not very toxic	DEGBE does not have the reproductive toxic hazards that some other glycol ethers do.	
diethylene glycol dibutyl ether (DEGDBE)	112-73-2	combustible	Very low <0.4 mmHg	no PEL			Not very toxic	DEGDBE does not have the reproductive toxic hazards that some other glycol ethers do.	
diethylene glycol diethyl ether (DEGDDE)	112-36-7		Very low 0.4 mmHg	5 ppm 8-hr TWA SKIN			Highly toxic	This is a glycol ether that is a reproductive toxin. Easily absorbed through skin.	
diethylene glycol dimethyl ether (diglyme; DEGDME)	111-96-6	combustible	Low 2.4 mmHg	1ppm 8-hr TWA SKIN			Extremely toxic	This is a glycol ether that is a reproductive toxin. Easily absorbed through skin.	
diethylene glycol ethyl ether (DEGEE)	111-90-0	combustible	Very low 0.13 mmHg	no PEL				It is not known whether DEGEE has the reproductive toxic hazards that some other glycol ethers do.	
diethylene glycol methyl ether (DEGME)	111-77-3	combustible	Very low 0.18 mmHg	no PEL				It is likely that DEGME has some of the reproductive toxic hazards that some other glycol ethers do.	

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diethyl ether, see ethyl ether diglyme, see diethylene glycol dimethyl ether									
dimethyl acetamide (DMAC)	127-19-5	combustible	Very low 0.56 mmHg	10 ppm 8-hr TWA SKIN		50-500 ppm	Highly toxic	Can damage liver. Can cause birth defects or fetal loss in animals. May damage testicles. Skin absorption is extremely high!	
dimethyl benzene, see xylene dimethylformamide (DMF)	68-12-2	combustible	LOW 3 mmHg	10 ppm 8-hr TWA SKIN	HBEL 0.10 mg/m3	2-20 ppm	Highly toxic	Can damage liver. Nausea, vomiting and abdominal pain are symptoms of overexposure. May damage kidneys. Causes birth defects in animals. Suggested possible cause of testicular cancer. Extremely easily absorbed through skin as a liquid or vapor.	
n,n-dimethyl formic acid, see dimethylformamide									
dimethyl ketone, see acetone									
DMF, see dimethylformamide									
dioxane (1,4-dioxane)	123-91-1	flammable	MEDIUM 37 mmHg	25 ppm 8-hr TWA SKIN	NIOSH 1 ppm/ 30 minutes HBEL 0.0017 mg/m3	25-250 ppm	Extremely toxic	Causes cancer in animals. Toxic to liver and kidneys. Easily absorbed through skin, causing poisoning without any warning signs.	Not suitable for use with filter-type respirators due to inadequate warning properties.
dioxolane	646-06-0	flammable	HIGH 110 mmHg	no PEL			Not very toxic	Irritant.	
1,2-ethanediol, see ethylene glycol									
ethanol	64-17-5	flammable	MEDIUM 58 mmHg	1000 ppm 8-hr TWA		85-850 ppm	Not very toxic	Vapors are not very toxic, but are irritating. Industrial ethanol is often "denatured" (by adding methanol or other toxic substances) in order to prevent people from drinking it. Denatured alcohol is often labeled "SD Alcohol".	
2-ethoxyethanol	110-80-5	combustible	LOW 5 mmHg	5 ppm 8-hr TWA SKIN	NIOSH 0.5 ppm SKIN HBEL 0.7 mg/m3	3-30 ppm	Extremely toxic	This solvent is a glycol ether. Causes birth defects and testicular damage in animals. Damages blood cells and bone marrow. Easily absorbed through skin.	Not suitable for use with filter-type respirators due to inadequate warning properties.
ethyl acetate	141-78-6	flammable	MEDIUM 95 mmHg	400 ppm 8-hr TWA	HBEL 9.6 mg/m3	4-40 ppm	Not very toxic	Irritant.	
ethyl alcohol, see ethanol									
ethyl benzene	100-41-4	flammable	LOW 9.6 mmHg	100 ppm 8-hr TWA 125 ppm STEL	HBEL 3.4 mg/m3	2-20 ppm	Moderately toxic	Irritant. Weak evidence for cancer-causing ability. Weak reproductive hazard. Easily absorbed through skin.	
ethylene dichloride, see 1,2-dichloroethane									
ethylene glycol	107-21-1	can burn if heated	VERY LOW 0.075 mmHg	50 ppm ceiling	(NIOSH says 50 ppm is not protective) HBEL 21.3 mm/m3		Moderately toxic	Damages kidneys (when ingested). Very high exposures cause birth defects in animals. Vapor exposures are usually too low to be harmful.	

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ethylene glycol butyl ether (EGBE)	111-76-2	combustible	LOW 1.1 mmHg	25 ppm 8-hr TWA SKIN	NIOSH 5 ppm HBEL 0.069 mg/m3	0.1-1 ppm	Moderately toxic	This solvent is a glycol ether. Damages blood cells, but does not have the reproductive toxic hazards that some other glycol ethers do. Easily absorbed through skin.	
ethylene glycol diethyl ether (EGDEE)	629-14-1		LOW-MED 10 mmHg	5 ppm 8-hr TWA SKIN			Highly toxic	This solvent is a glycol ether and a reproductive toxin.	
ethylene glycol dimethyl ether (EGDME)	110-71-4	moderate fire risk	MEDIUM 75 mmHg	1 ppm 8-hr TWA SKIN			Extremely toxic	This solvent is a glycol ether. Causes birth defects and testicular damage in animals. Easily absorbed through skin.	
ethylene glycol monoethyl ether, see 2-ethoxyethanol									
ethylene glycol monomethyl ether, see 2-methoxyethanol									
ethyl ether (diethyl ether)	60-29-7	very flammable; explosive if distilled to dryness	HIGH 538 mmHg	400 ppm 8-hr TWA 500 ppm STEL-15	(NIOSH says the PEL is not protective) HBEL 2.1 mg/m3	9-90 ppm	Not very toxic	Irritant. Discontinued use as anesthetic gas mainly because of explosive hazard and risk of death at anesthetic levels.	
FC-11, see trichlorofluoromethane									
FC-12, see dichlorodifluoromethane									
FC-22, see dichlorodifluoromethane									
FC-113, see 1,1,2-trichloro-1,2,2-trifluoroethane									
FC-114, see 1,2-dichlorotetrafluoroethane									
fluorocarbons (Freons®; a group of related solvents and solvent mixtures)		will not burn	Most are gases at room temp	varies from 10 ppm to 1000 ppm, 8-hr TWA		varies, depending which type of fluorocarbon	Varies (most are of low toxicity)	See individual entries. Severe overexposure to fluorocarbon vapors can cause heart palpitations and heart failure at the time of exposure. Many are harmful to ozone layer in the upper atmosphere.	Unsuitable for use with filter-type respirators due to inadequate warning properties.
formamide	75-12-7	combustible	Very low	10 ppm 8-hr TWA SKIN		nearly odorless	Highly toxic	Birth defects in animals. Liver damage.	
furfural	98-01-1	combustible	Low 2.2 mmHg	2 ppm 8-hr TWA SKIN	(NIOSH says the PEL is not protective) HBEL 0.07 mg/m3	0.1-1 ppm	Extremely toxic	Can damage liver. Some evidence of cancer in animals. Easily absorbed through skin.	
gasoline	8006-61-9	flammable	MEDIUM to HIGH 38-300 mmHg	300 ppm 8-hr TWA 500 ppm STEL-15			Moderately toxic	Often contains benzene (see above) and other highly toxic substances such as organic lead. Causes cancer in rats but possibly not in humans.	
grain alcohol, see ethanol									
heptane (n-heptane)	142-82-5	flammable	MEDIUM 46 mmHg	400 ppm 8-hr TWA 500 ppm STEL	NIOSH 85 ppm 440 ppm STEL-15	150-1500 ppm	Not very toxic	Good substitute for hexane.	
hexachlorobutadiene	87-68-3	non-flammable	VERY LOW	0.02 ppm 8-hr TWA SKIN			Extremely toxic	Causes cancer in animals. Easily absorbed through skin.	

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hexamethylene, see cyclohexane									
hexane (except for n-hexane)		flammable	HIGH 152 mmHg	500 ppm 8-hr TWA 1000 ppm STEL-15	NIOSH 100 ppm; 510 ppm for 15 min.	130-1300 ppm	Not very toxic	Hexane is a mixture of several molecular forms. It often contains n-hexane.	
n-hexane (a type of hexane)	100-54-3	flammable	HIGH 152 mmHg	50 ppm 8-hr TWA	HBEL 0.69 mg/m3	130-1300 ppm	Highly toxic	Causes peripheral neuropathy (nerve damage in the legs and arms).	Unsuitable for use with filter-type respirators due to inadequate warning properties.
2-hexanone, see methyl n-butyl ketone									
High Flash Naphtha, see Stoddard Solvent									
isopropanol, see isopropyl alcohol									
isopropyl alcohol	67-63-0	flammable	MEDIUM 46 mmHg	400 ppm, 8-hr TWA 500 ppm STEL		22-220 ppm	Not very toxic	Irritant	
d-limonene	5989-27-5	combustible	LOW 1.9 mmHg	no PEL	30 ppm 8-hr TWA (AIHA)	1 ppb (0.001 ppm)	Moderately toxic	Can cause allergic contact dermatitis in a large proportion of users. Can damage the liver. Causes cancer in rats but probably not in humans. Easily absorbed through skin.	
MEK, see methyl ethyl ketone									
methanol	67-56-1	flammable	HIGH 128 mmHg	200 ppm 8-hr TWA 250 ppm STEL-15 1000 ppm ceiling SKIN	HBEL 5.3 mg/m3	100-1000 ppm	Moderately toxic	Can cause blindness or death if swallowed. (Breathing vapors and skin absorption are not likely to cause blindness.) Absorbed easily through the skin.	Organic vapor respirator cartridges (charcoal) are NOT effective; also has inadequate warning properties.
2-methoxyethanol (methyl Cellosolve; EGMF)	109-86-4	combustible	LOW-MED 9.8 mmHg	5 ppm 8-hr TWA SKIN	NIOSH 0.1 ppm SKIN HBEL 0.07 mg/m3	2.3-23 ppm	Extremely toxic	This solvent is a glycol ether. Causes birth defects and testicular damage in animals. Damages blood cells and bone marrow. Easily absorbed through skin.	Unsuitable for use with filter-type respirators due to inadequate warning properties.
methyl acetate	79-20-9	flammable	HIGH 219 mmHg	200 ppm 8-hr TWA 250 ppm STEL-15	HBEL 10.7 mg/m3	5-50 ppm	Not very toxic	Irritant. Extremely high levels can damage optic nerve (eyes).	
methyl acetic ester, see methyl acetate									
methyl alcohol, see methanol									
methyl benzene, see toluene									
methyl Cellosolve, see 2-methoxyethanol									
methyl chloride	74-87-3	flammable	Gas at room temp	5 ppm 8-hr TWA 100 ppm STEL-15 300 ppm ceiling	NIOSH carcin; lowest feasible exposure. HBEL 0.0029 mg/m3		Extremely toxic	Reproductive hazard. Possible carcinogen. Strong effects on brain. Symptoms can be delayed for several hours after exposure. Easily absorbed through skin.	Organic vapor respirator cartridges (charcoal) are NOT effective for methyl chloride.

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methyl chloroform, see 1,1,1-trichloroethane methylene chloride	75-09-2	will not burn	HIGH 442 mmHg	50 ppm 8-hr TWA	NIOSH carcinogen; lowest feasible exposure. HBEL 0.011 mg/m ³	250-2500 ppm	Highly toxic	Causes cancer in animals; suspected of causing cancer in humans. Changes to carbon monoxide in the body. Can aggravate pre-existing heart disease. Easily absorbed through skin.	Unsuitable for use with filter-type respirators due to inadequate warning properties.
methyl ethyl ketone	78-93-3	flammable	MEDIUM 96 mmHg	200 ppm 8-hr TWA 300 ppm STEL-15	HBEL 3.4 mg/m ³	5.5-55 ppm	Not very toxic	Makes n-hexane and methyl n-butyl ketone more able to cause nerve damage.	
methyl isobutyl ketone (MIBK; hexone)	108-10-1	flammable	MEDIUM 20 mmHg	50 ppm 8-hr TWA 75 ppm STEL	HBEL 0.28 mg/m ³	0.7-7 ppm	Not very toxic		
methyl n-butyl ketone (methyl butyl ketone; MBK; 2-hexanon)	591-78-6	flammable	MEDIUM 12 mmHg	5 ppm 8-hr TWA SKIN	NIOSH 1 ppm	0.08-0.8 ppm	Extremely toxic	Can cause nerve damage to the arms and legs (peripheral neuropathy). Easily absorbed through skin.	
N-methyl formamide (NMF)	123-39-7		VERY LOW	no PEL			Highly toxic	Can damage liver. Easily absorbed through skin.	
N-methyl pyrrolidone (NMP)	872-50-4	combustible	VERY LOW 0.3 mmHg	no PEL			Moderately toxic	Causes birth defects in animals. Easily absorbed through skin. May cause miscarriage if absorbed during pregnancy.	
mineral spirits, see Stoddard Solvent									
morpholine	110-91-8	flammable	LOW-MED 10 mmHg	20 ppm 8-hr TWA 30 ppm STEL-15 SKIN		0.01-0.10 ppm	Highly toxic	Strong irritant. High exposures can damage the lungs, liver, and kidney. Possible carcinogen. Easily absorbed through skin.	
naphtha, coal tar petroleum naphtha)	8030-31-7	combustible	LOW <5 mmHg	100 ppm 8-hr TWA			Moderately toxic		
2-nitropropane	79-46-9	flammable	MEDIUM 17 mmHg	10 ppm 8-hr TWA	NIOSH carcinogen; lowest feasible exposure	70-700 ppm	Extremely toxic	Affects kidneys and liver. Causes cancer in animals.	
p-dioxane, see dioxane									
pentane (n-pentane)	109-66-0	very flammable	HIGH 519 mmHg	600 ppm 8-hr TWA 750 STEL-15	NIOSH 120 ppm; 610 ppm STEL-15	400-4000 ppm	Not very toxic		
perc, see perchloroethylene perchloroethylene (perc; tetrachloroethylene)	127-18-4	will not burn	MEDIUM 18 mmHg	25 ppm 8-hr TWA 300 ppm ceiling	NIOSH carcin; lowest feasible exposure. HBEL 0.01 mg/m ³	27-270 ppm	Highly toxic	Damages liver, kidneys. Causes cancer in animals.	
petroleum naphtha, see VM&P naphtha									
phenol	108-95-2	combustible	VERY LOW 0.4 mmHg	5 ppm 8-hr TWA SKIN	NIOSH ceiling 15.6 ppm 15 min. HBEL 6.4 mg/m ³	0.04-0.4 ppm	Extremely toxic	Death or serious illness can occur after skin absorption with no warning properties. Easily absorbed through skin, even as a vapor. Can cause burns.	
2-propanol, see isopropyl alcohol									
2-propanone, see acetone									
propylene glycol (propanediol)	57-55-6	combustible	VERY LOW 0.2 mmHg	no PEL	HBEL 20.7 mg/m ³		Not very toxic	Very low toxicity.	

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1,1,2-trichloro-1,2,2-trifluoroethane (Freon 113)	76-13-1	will not burn	HIGH 369 mmHg	1000 ppm 8-hr TWA 1250 ppm STEL-30 2000 ppm ceiling	HBEL 93.1 mg/m3	45-450 ppm	Not very toxic	Extremely high vapor concentrations can cause heart palpitations and heart failure at the time of exposure. Harmful to ozone layer in the upper atmosphere.	Not suitable for use with filter-type respirators due to inadequate warning properties.
triethylene glycol dimethyl ether (TEGDME)	112-49-2		VERY LOW 0.9 mmHg	5 ppm 8-hr TWA SKIN			Highly toxic	This is a glycol ether and a reproductive toxin.	
vinylidene chloride	75-35-4	flammable	HIGH 608 mmHg	1 ppm 8-hr TWA	NIOSH carcinogen: minimize exposure HBEL 0.00011 mg/m3	190-1900 ppm	Extremely toxic	Causes liver and kidney damage; suspected carcinogen.	
vinyl trichloride, see 1,1,2-trichloroethane									
VM&P Naphtha	8032-32-4	flammable	MEDIUM	300 ppm 8-hr TWA 400 ppm STEL-15	NIOSH: approx 85 ppm; Ceiling approx 440 ppm		Not very toxic		
wood alcohol (wood spirit), see methanol									
xylene (a mixture of o-xylene, m-xylene, and p-xylene)	1330-20-7 95-47-6 108-38-3 106-42-3	flammable	LOW 6.6-9.6 mmHg	100 ppm 8-hr TWA 150 ppm STEL-15 300 ppm ceiling	HBEL 2.1 mg/m3	1-10 ppm	Moderately toxic	May damage kidneys, liver, gastrointestinal tract, and cornea of the eye. Easily absorbed through skin.	