

7. REGULATIONS AND ADVISORIES

Table 7-1 summarizes international, national, and state regulations and guidelines on human exposure to carbon disulfide. No EPA, NTP, or IARC cancer classifications were reported for carbon disulfide.

ATSDR has derived an inhalation MRL of 0.3 ppm for chronic-duration inhalation exposure in humans exposed 8 hours/day, 5 days/week; this MRL is based on a LOAEL of 7.6 ppm (Johnson et al. 1983). In addition, ATSDR has derived an oral MRL of 0.01 mg/kg/day for acute-duration oral exposure; this MRL is based on a LOAEL of 3 mg/kg/day in mice (Masuda et al. 1986).

An oral reference dose (RfD) of 0.1 mg/kg/day has been derived by EPA for carbon disulfide (IRIS 1995). The RfD is based on a NOAEL of 11 mg/kg/day carbon disulfide for fetal toxicity in rabbits following inhalation exposure (Hardin et al. 1981). An inhalation reference concentration (RfC) of 0.7 mg/m³ (0.2 ppm) was also derived for carbon disulfide (IRIS 1995). The RfC was based on a benchmark concentration (human-equivalent) of 19.7 mg/m³ (6.3 ppm) divided by an uncertainty factor of 30 (Johnson et al. 1983).

The Clean Air Act regulates carbon disulfide for equipment leaks of volatile organic compounds in the synthetic organic chemical manufacturing industry (EPA 1995g).

OSHA has limited the 8-hour workplace exposure to carbon disulfide to 20 ppm (OSHA 1995a). This OSHA exposure value reflects the limit that was in effect prior to the issuance of the new limits (carbon disulfide was 4 ppm (PEL), 12 ppm (STEL) and 500 ppm (IDLH)) on January 19, 1989, which were vacated by the Eleventh Circuit Court of Appeals on July 7, 1992. NIOSH has recommended a TWA of 1 ppm and a STEL of 10 ppm (NIOSH 1994). The ACGIH has recommended a TLV-TWA of 10 ppm (ACGIH 1995).

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TABLE 7-1. Regulations and Guidelines Applicable to Carbon Disulfide

Agency	Description	Information	References
<u>INTERNATIONAL</u>			
WHO	Occupational exposure limits TWA (male human) TWA (females of fertile age) STEL (15-minute)	10 mg/m ³ (3.2 ppm) 3 mg/m ³ (0.96 ppm) 60 mg/m ³ (19.2 ppm)	WHO 1981
<u>NATIONAL</u>			
Regulations:			
a. Air:			
EPA	Standards of performance for new stationary sources: requirements to prevent equipment leaks of volatile organic compounds (VOCs) in the synthetic organic chemical manufacturing industry (SOCMI) in compliance with the Clean Air Act; carbon disulfide	Yes	EPA 1995a (48 FR 48335)
OSHA	Final rule limits: PEL TWA (8-hour) STEL (15-minute) Skin designation Max peak (30-minute) Ceiling IDHL	20 ppm (60 mg/m ³) 12 ppm (36 mg/m ³) Yes 100 ppm (300 mg/m ³) 30 ppm (90 mg/m ³) 500 ppm	OSHA 1995a (58 FR 40191)
b. Water:			
EPA OWRS	NPDES permit application testing requirements; toxic pollutants and hazardous substances required to be identified by existing dischargers if expected to be present	Yes	EPA 1995b (48 FR 14153)
c. Food:			
EPA	Removal of carbon disulfide's exemption from the requirement of a tolerance in or on raw agricultural commodities; 40 CFR 180 amended	Yes	EPA 1995c (54 FR 6130)
	Tolerances for the nematicide, insecticide, and fungicide from the application of sodium tetrathiocarbonate in or on grapefruit, grapes, lemons, and oranges	0.1 ppm	EPA 1995d (58 FR 33771)

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TABLE 7-1. Regulations and Guidelines Applicable to Carbon Disulfide (continued)

Agency	Description	Information	References
<u>NATIONAL</u> (Cont.)			
d. Other:			
DOT	DOT-Hazard: Flammable Liquid Label: Flammable Liquid	Yes	DOT 1995a (55 FR 52472)
	DOT-IMO: Flammable Liquid Label: Flammable Liquid, Poison	Yes	DOT 1995b (55 FR 52582)
EPA OERR	CERCLA reportable quantity	100 pounds (45.4 kg)	EPA 1995e (50 FR 13474)
	Extremely hazardous substance TPQ	10,000 pounds	EPA 1995f (55 FR 5546)
EPA OSW	Designation of hazardous substance under section 311(b)(2)(A) of the Federal Water Pollution Control Act	Yes	EPA 1995g (54 FR 33482)
	Listed as toxic waste from nonspecific sources: spent nonhalogenated solvents such as carbon disulfide; spent solvent mixtures containing a total of at least 10% (by volume) of carbon disulfide before use; and still bottoms from the recovery of above nonhalogenated solvent and solvent mixtures; this item was listed as a hazardous waste due to its toxicity and ignitability	Yes	EPA 1995h (46 FR 4618)
	Listed as hazardous waste: discarded commercial chemical products, off- specification species, container residues, and spill residues thereof	Yes	EPA 1995i (45 FR 78529)
	Listed as a hazardous constituent	Yes	EPA 1995j (56 FR 7568)
	Groundwater monitoring requirement list	Yes	EPA 1995k (52 FR 25947)
EPA OTS	Toxic chemical release reporting: community-right-to-know	Yes	EPA 1995l (60 FR 34187)
OSHA	Meets criteria for OSHA medical records rule	Yes	OSHA 1995b (48 FR 35736)
Guidelines:			
a. Air:			
ACGIH	TLV TWA	10 ppm (31 mg/m ³)	ACGIH 1995
	Skin designation	Yes	ACGIH 1995
	BEI: 2-thiothiazolidine-4- carboxylic acid in urine at the end of shift	5 mg/g creatinine	ACGIH 1995

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TABLE 7-1. Regulations and Guidelines Applicable to Carbon Disulfide (*continued*)

Agency	Description	Information	References
<u>NATIONAL</u> (Cont.)			
NIOSH	REL TWA (10-hour) Skin designation STEL (15-minute)	1 ppm (3 mg/m ³) Yes 10 ppm (30 mg/m ³)	NIOSH 1994 NIOSH 1994 NIOSH 1994
b. Other: EPA	RfD (oral) RfC (inhalation)	1×10 ⁻¹ mg/kg/day 7×10 ⁻¹ mg/m ³	IRIS 1995 IRIS 1995
<u>STATE</u> ^a			
Regulations and Guidelines:			
a. Air:	Acceptable ambient air concentrations		NATICH 1995
Arizona	(1-hour)	0.029 ppm (0.091 mg/m ³)	
	(24-hour)	0.008 ppm (0.024 mg/m ³)	
Connecticut	(8-hour)	0.019 ppm (0.0600 mg/m ³)	
Florida	(8-hour)	0.096 ppm (0.300 mg/m ³)	
Florida	(8-hour)	0.038 ppm (0.120 mg/m ³)	
	(24-hour)	0.009 ppm (0.0280 mg/m ³)	
	(annual)	0.00 ppm (0.00001 mg/m ³)	
Louisiana	(8-hour)	0.028 ppm (0.086 mg/m ³)	
Nevada	(8-hour)	0.228 ppm (0.7140 mg/m ³)	
New York	(1-year)	0.032 ppm (0.100 mg/m ³)	
North Carolina	(24-hour)	0.060 ppm (0.186 mg/m ³)	
North Dakota	(8-hour)	0.100 ppm (0.3100 mg/m ³)	
Oklahoma	(24-hour)	0.020 ppm (0.062 mg/m ³)	
South Carolina	(24-hour)	0.048 ppm (0.150 mg/m ³)	

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TABLE 7-1. Regulations and Guidelines Applicable to Carbon Disulfide (continued)

Agency	Description	Information	References
<u>STATE</u> (Cont.)			
Texas	(30-minute)	0.010 ppm (0.030 mg/m ³)	
	(annual)	0.001 ppm (0.003 mg/m ³)	
Vermont	(24-hour)	0.228 ppm (0.714 mg/m ³)	
Virginia	(24-hour)	0.166 ppm (0.520 mg/m ³)	
Washington	(24-hour)	0.032 ppm (0.099 mg/m ³)	
Wisconsin	(24-hour)	0.230 ppm (0.720 mg/m ³)	
b. Water:	Drinking water quality guidelines		HSDB 1995
Arizona		830 µg/L	
Michigan		80 µg/L	
Minnesota		700 µg/L	

^aState regulations are not necessarily applied state-wide. For specific information as to the areas affected by the regulations refer to NATICH 1992.

ACGIH = American Conference of Governmental Industrial Hygienists; BEI = Biological Exposure Index; CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act; CFR = Code of Federal Regulations; DOT = Department of Transportation; DOT-IMO = Department of Transportation/International Maritime Organization; EPA = Environmental Protection Agency; NIOSH = National Institute for Occupational Safety and Health; NPDES = National Pollutant Discharge Elimination System; OERR = Office of Emergency and Remedial Response; OSHA = Occupational Safety and Health Administration; OSW = Office of Solid Wastes; OTS = Office of Toxic Substances; OWRS = Office of Water Regulations and Standards; PEL = Permissible Exposure Limit; REL = Recommended Exposure Limit; RfC = Reference Concentration; RfD = Reference Dose; STEL = Short-Term Exposure Limit; TLV = Threshold Limit Value; TPQ = Threshold Planning Quantity; TWA = Time-Weighted Average; WHO = World Health Organization

