

SAFETY DATA SHEET



CARBON TETRACHLORIDE, TECHNICAL GRADE

North America EN
SDS No.: M47013

Rev. Date: 18-Feb-2025
Rev. Num. 07

SECTION 1. CHEMICAL PRODUCT / COMPANY IDENTIFICATION

Company Identification:	Occidental Chemical Corporation 14555 Dallas Parkway, Suite 400 Dallas, Texas 75254-4300
24-Hour Emergency Telephone Number:	1-800-733-3665 (USA); CANUTEC (Canada): 1-613-996-6666; CHEMTREC (within USA and Canada): 1-800-424-9300; CHEMTREC (outside USA and Canada): +1 703-527-3887; CHEMTREC Contract No: CCN16186
To Request an SDS:	MSDS@oxy.com or 1-972-404-3245
Customer Service:	1-800-752-5151 or 1-972-404-3700
Product Identifier:	CARBON TETRACHLORIDE, TECHNICAL GRADE
Synonyms:	CARBON TET; Tetrachloromethane; Perchloromethane; METHANE TETRACHLORIDE
Product Use:	<ul style="list-style-type: none">• Repackaging for use as a laboratory chemical*• *NOTE: As allowed by 40 CFR Chapter I Subchapter R Part 751 Subpart H § 751.707 and § 751.709. Repackaging for use as a laboratory chemical requires customer to provide an ANNUAL certification of compliance with 40 CFR Part 82, Production and Consumption Controls for Protection of Stratospheric Ozone (the "EPA Regulations") to Occidental Chemical Corporation. In addition, all customers must meet reporting and recordkeeping requirements of 40 CFR Part 82.• Industrial processing as a reactant in the production of Hydrochlorofluorocarbons (HCFCs), Hydrofluorocarbons (HFCs), Hydrofluoroolefins (HFOs) and Perchloroethylene (PCE)**• Industrial use as an industrial processing aid in the manufacture of Vinyl Chloride**• Industrial Use in the elimination of Nitrogen Trichloride in the production of Chlorine and Caustic Soda and the recovery of Chlorine in tail gas from the production of Chlorine**• **NOTE: As allowed by 40 CFR Chapter I Subchapter R Part 751 Subpart H §

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751.707 under the use of a Workplace Chemical Protection Program (WCPP).

Uses Advised Against and/or Restricted:

- Should not be used in any applications that are not authorized under the Montreal Protocol, which is implemented in the United States under the federal Clean Air Act regulations 40 CFR Part 82, Subpart A. Prohibited uses include, but are not limited to, dry cleaning, fire extinguishers, and aerosol propellants
- Other Prohibitions of Certain Industrial and Commercial Uses and Manufacturing, Processing, and Distribution in Commerce of Carbon Tetrachloride for Those Uses are specifically identified in 40 CFR Chapter I Subchapter R Part 751 Subpart H § 751.705 —Carbon Tetrachloride Risk Management Rule

Restrictions on Use (United States):

- FOR INDUSTRIAL USE ONLY
- Use of Carbon Tetrachloride in consumer products is banned by the Consumer Product Safety Commission (CPSC), under the Federal Hazardous Substance Act (FHSA) 16 CFR 1500.17
- After June 16, 2025, this chemical substance (as defined in TSCA section 3(2)) may not be distributed in commerce or processed in greater than trace quantities for the following purposes: Incorporation into formulation, mixture or reaction products in petrochemical-derived manufacturing except in the manufacture of vinyl chloride; Industrial and commercial use as an industrial processing aid in the manufacture of petrochemicals-derived products except in the manufacture of vinyl chloride; Industrial and commercial use in the manufacture of other basic chemicals (including manufacturing of chlorinated compounds used in solvents, adhesives, asphalt, and paints and coatings), except for use in the elimination of nitrogen trichloride in the production of chlorine and caustic soda and the recovery of chlorine in tail gas from the production of chlorine; Industrial and commercial use in metal recovery; Industrial and commercial use as an additive; and beginning December 18, 2025, industrial and commercial specialty uses by the U.S. Department of Defense.

Restrictions on Use (EU):

Carbon tetrachloride is restricted by regulation (EC) No 1804/2003 of the European Parliament and of the Council of 22 September 2003 amending Regulation (EC) No 2037/2000, on substances that deplete the ozone layer.

Other Global Restrictions on Use:

Carbon Tetrachloride is considered an ozone depleting substance (ODS) and its production and use are controlled under the 1987 Montreal Protocol on Substances That Deplete the Ozone Layer and its amendments (Montreal Protocol Annex B – Group II). Other restrictions on use based on local, regional, or national regulations may exist and must be determined on a case-by-case basis.

Chemical Family:

Aliphatic halogenated solvent

SECTION 2. HAZARDS IDENTIFICATION

OSHA REGULATORY STATUS: This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

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HEALTH CANADA HPR REGULATORY STATUS: This material is considered hazardous by the Health Canada Hazardous Products Act's Hazardous Products Regulations (HPR) (SOR/2015-17).

EMERGENCY OVERVIEW:

Color: Colorless
Physical State: Liquid
Odor: Mildly sweet odor, Characteristic, ether-like odor
Signal Word: **DANGER**

MAJOR HEALTH HAZARDS: MAY BE HARMFUL IF SWALLOWED. MAY BE FATAL IF SWALLOWED AND ENTERS AIRWAYS. HARMFUL IF INHALED. CAUSES SKIN IRRITATION. MAY BE ABSORBED THROUGH THE SKIN. CAUSES EYE IRRITATION. MAY CAUSE DROWSINESS OR DIZZINESS. SUSPECTED OF CAUSING CANCER. CAUSES DAMAGE TO LIVER, KIDNEY, AND LUNGS (PULMONARY EDEMA). MAY CAUSE DAMAGE TO LIVER AND KIDNEYS THROUGH PROLONGED OR REPEATED EXPOSURE. ALCOHOL CONSUMPTION MAY INCREASE TOXIC EFFECTS.

AQUATIC TOXICITY: HARMFUL TO AQUATIC LIFE. TOXIC TO AQUATIC LIFE WITH LASTING EFFECTS. Marine Pollutant.

ECOLOGICAL HAZARDS: HARMS PUBLIC HEALTH AND THE ENVIRONMENT BY DESTROYING OZONE IN THE UPPER ATMOSPHERE.

PRECAUTIONARY STATEMENTS: Obtain, read, and follow all safety instructions before use. Do not breathe mist, vapors, or spray. Wash hands and exposed skin and clothing thoroughly after handling. Do not touch eyes. Do not eat, drink, or smoke when using this product. Use only outdoors or in a well-ventilated area. Wear protective gloves, protective clothing, eye, and face protection. Wear respiratory protection as required, See Section 8 for additional information. Contaminated work clothing should not be allowed out of the workplace. Avoid release to the environment.

ADDITIONAL HAZARD INFORMATION: Warning: Contains Carbon Tetrachloride, a substance which harms public health and environment by destroying ozone in the upper atmosphere.

HAZARD CLASSIFICATION:

Note: EPA has identified reproductive toxicity as a concern. Based on GHS criteria, reproductive toxicity is not classifiable.

GHS: CONTACT HAZARD - SKIN:	Category 2 - Causes skin irritation
GHS: CONTACT HAZARD - EYE:	Category 2B - Causes eye irritation
GHS: ACUTE TOXICITY - INHALATION:	Category 4 - Harmful if inhaled
ASPIRATION HAZARD:	Category 1 - May be fatal if swallowed and enters airways
GHS: TARGET ORGAN TOXICITY (SINGLE	- Category 1 - Causes damage to Liver, Kidney, and

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EXPOSURE):	Lungs - Category 3 - May cause drowsiness or dizziness
GHS: TARGET ORGAN TOXICITY (REPEATED EXPOSURE):	Category 1 - Causes damage to Liver and Kidney through prolonged or repeated exposure
GHS: CARCINOGENICITY:	Category 2 - Suspected of causing cancer
GHS: HEALTH HAZARDS NOT OTHERWISE CLASSIFIED (HHNOC)	- Acute Toxicity [Oral), Category 5 - May be harmful if swallowed
GHS: HAZARDOUS TO THE OZONE LAYER:	Category 1 - Harms the public health and the environment by destroying ozone in the upper atmosphere
HAZARDS NOT OTHERWISE CLASSIFIED (HNOC):	- ACUTE AQUATIC HAZARD - CATEGORY 3: Harmful to aquatic life - AQUATIC TOXICITY - CHRONIC : Category 2 (Toxic to aquatic life with long lasting effects)

UNKNOWN ACUTE TOXICITY: Not applicable.

Unknown Acute Oral Toxicity:

100% of this product consists of ingredient(s) of known acute oral toxicity.

Unknown Acute Dermal Toxicity:

100% of this product consists of ingredient(s) of known acute dermal toxicity.

Unknown Acute Inhalation Toxicity:

100% of this product consists of ingredient(s) of known acute inhalation toxicity.

GHS SYMBOL: Exclamation mark, Health hazards, Environmental hazard



GHS SIGNAL WORD: DANGER

GHS HAZARD STATEMENTS:

GHS - Health Hazard Statement(s)

- May be harmful if swallowed
- May be fatal if swallowed and enters airways
- Causes skin irritation
- Causes eye irritation
- Harmful if inhaled
- May cause drowsiness or dizziness
- Suspected of causing cancer
- Causes damage to Liver, Kidney, and Lungs (pulmonary edema)
- Causes damage to liver and kidney through prolonged or repeated exposure

GHS - Environmental Hazard Statement(s)

- Harmful to aquatic life
- Toxic to aquatic life with long lasting effects
- Harms public health and the environment by destroying ozone in the upper atmosphere

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GHS - Precautionary Statement(s) - Prevention

- Obtain, read, and follow all safety instructions before use
- Do not breathe mist, vapors, or spray
- Wash hands and exposed skin and clothing thoroughly after handling. Do not touch eyes
- Do not eat, drink, or smoke when using this product
- Use only outdoors or in a well-ventilated area
- Wear protective gloves, protective clothing, eye, and face protection
- Avoid release to the environment

GHS - Precautionary Statement(s) - Response

- IF SWALLOWED: Get emergency medical help immediately
- Do NOT induce vomiting
- IF ON SKIN: Wash with plenty of soap and water
- If skin irritation occurs: Get medical help
- Take off contaminated clothing and wash it before reuse
- IF INHALED: Remove person to fresh air and keep comfortable for breathing
- IF INHALED: Get medical help
- IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
- If eye irritation persists: Get medical help
- IF exposed or concerned: Get emergency medical help immediately
- Contain release
- Specific treatment (see "Notes to Physician" in Section 4 of the SDS)

GHS - Precautionary Statement(s) - Storage

- Store in a well-ventilated place. Keep container tightly closed
- Store locked up

GHS - Precautionary Statement(s) - Disposal

- Dispose of contents and container in accordance with applicable local, regional, national, and/or international regulations
- Refer to manufacturer/supplier for information on recovery/recycling

Health Hazards of Significance Not Mentioned in GHS Classification

- Alcohol consumption may increase toxic effects
- May be absorbed through the skin
- Harms public health and the environment by destroying ozone in the upper atmosphere

Additional Hazard Information

Harms public health and the environment by destroying ozone in the upper atmosphere

Persistent, Bioaccumulative, and Toxic (PBT) and Very Persistent and Very Bioaccumulative (vPvB) Assessment:

Carbon Tetrachloride meets the T criterion and the P criterion but not the B criterion. Therefore, it is not considered either as a PBT or a vPvB substance.

Endocrine Disruptor Assessment:

Carbon Tetrachloride is listed on The Endocrine Disruptors Exchange's (TEDX) List of Potential Endocrine Disruptors database of chemicals with the potential to affect the endocrine system. Every chemical on the TEDX List has one or more verified citations published, accessible, primary scientific research demonstrating effects on the endocrine system.

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Component	Endocrine Screening List
Carbon Tetrachloride	TEDX Potential Endocrine List: Present US EPA Endocrine Final Screening List: Present (SDWA chemical) Japan EXTEND List: Not Currently Tested ATSDR Endocrine List: Present

See Section 11: TOXICOLOGICAL INFORMATION

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Component	Systematic Chemical Name	Common name	CAS Number	Percent [%]
Carbon Tetrachloride 56-23-5	Tetrachloromethane	Carbon Tetrachloride	56-23-5	99.5 - 100

SECTION 4. FIRST AID MEASURES

General Advice: IF exposed or concerned: Get emergency medical help immediately.

EYE CONTACT: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical help.

SKIN CONTACT: IF ON SKIN: Wash with plenty of soap and water. Take off contaminated clothing and wash before reuse. If skin irritation occurs: Get medical help.

INHALATION: IF INHALED: Remove person to fresh air and keep comfortable for breathing. IF INHALED: Get medical help.

INGESTION: IF SWALLOWED: Get emergency medical help immediately. Do NOT induce vomiting. Specific treatment for oral ingestion (see "Notes to Physician" in Section 4 of the SDS).

MOST IMPORTANT SYMPTOMS/EFFECTS (ACUTE AND CHRONIC [DELAYED]):

Acute Symptoms/Effects: The principal clinical syndromes are the same regardless of exposure route and are dose dependent: Central Nervous System (CNS) depression, Gastrointestinal (GI) irritation, cardiovascular disturbances, severe liver and kidney injury.

Eye: Eye Irritation. Eye exposure may cause irritation, tearing, pain, conjunctivitis, clouding of cornea.

Skin: Skin Irritation. Skin exposure may cause burning and prickling sensations, itching, irritation, red skin,

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edema, small peripheral blisters.

Inhalation (Breathing): Respiratory System Effects: Central Nervous System (CNS) effects are characteristic following inhalation of chlorinated hydrocarbons and can range from lightheadedness at low level exposures to loss of consciousness at high levels. CNS effects are an early warning that exposure to high levels has occurred and there is risk of cardiac effects (palpitations, low blood pressure, arrhythmia, arrest). CNS effects include the following symptoms: abdominal pain, nausea, vomiting, headache, lightheadedness, blurry or double vision, personality changes, weakness, slurred speech, stupor, incoordination (disequilibrium, ataxia), coma, and respiratory arrest. May irritate upper airways. Pulmonary edema and liver and kidney injury can be delayed by days.

Ingestion (Swallowing): Ingesting this material may cause gastrointestinal irritation, central nervous system (CNS) depression, CNS symptoms such as sedation, headache, tremor, vision disturbances, memory problems, nausea, vomiting, headache, breathing difficulty, reduced blood pressure, tachycardia, oliguria or anuria, severe liver injury (See Section 11). Ingestion may cause unconsciousness and death.

Chronic (Delayed) Symptoms/Effects: Delayed pulmonary edema has been reported as long as 8 days after the initial intoxication associated with renal failure. Reduced renal output (oliguria). Renal (kidney) failure. Elevation of liver enzymes. Liver failure. May cause chronic dermatitis - rough, dry, red skin due to extraction of fatty materials. May cause eye damage such as corneal damage, decreased vision.

Target Organ Effects: Liver; Kidney

Protection of First-Aid Responders: Protect against vapor/gas exposure. Protect against liquid contamination. Use personal protective equipment (PPE). Refer to Section 8 for specific PPE recommendations. Consider the possibility of high levels of gas in confined/unventilated spaces or low-lying areas.

Notes to Physician: There is no antidote for Carbon Tetrachloride poisoning. Treatment consists of support of respiratory, cardiovascular, hepatic, and renal functions. Catecholamine administration after exposure to this compound MAY pose enhanced risk of cardiac arrhythmia. This material is an aspiration hazard. For ingestion, nasogastric aspiration is recommended if volume ingested is of sufficient volume to aspirate. Protect the airway. Epinephrine and other sympathomimetic amines may initiate cardiac arrhythmias in individuals exposed and experiencing symptoms from this material. This compound is absorbed rapidly by oral administration and causes similar effects to inhalation exposure. Activated charcoal may be administered. Liver, kidney, and pulmonary injury may be delayed several days after exposure. May cross the placenta and may be excreted in breast milk.

Interaction with Other Chemicals Which Enhance Toxicity: There is substantial evidence that the toxicity of Carbon Tetrachloride is dramatically increased by alcohols, ketones and a variety of other chemicals. Many of these might be found at hazardous waste sites also containing Carbon Tetrachloride. Although the precise mechanisms for this marked potentiation are not always known, it is likely that most potentiators act, at least in part, by increasing the metabolic activation of Carbon Tetrachloride to its toxic intermediates and metabolites, thus increasing the induced injury. Other agents may affect the toxic outcome by altering cellular regenerative and tissue repair capacities. The extent to which either or both of these mechanisms are involved in the interaction will substantially affect the relationships among induced injury, duration of toxic damage, and animal survival. Interactions with agents enhancing lipid peroxidation would be expected to increase the severity of cell injury due to increased permeability of cell membranes. General and liver toxicity is significantly increased by alcohols, ketones and other chemicals that use the same metabolic pathways: acetaminophen, phenobarbital, methamphetamine, barbiturates, brominated or chlorinated solvents, DDT, PBB, chlordecone, nicotine, carbon disulfide, or other alkyl disulfides. Hypoxia may also increase sensitivity to toxicity. May potentiate other agents that cause Central Nervous System (CNS) depression and respiratory system depression. Catecholamine administration MAY pose increased risk of cardiac arrhythmias.

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Medical Conditions Aggravated by Exposure: May increase potential for cardiac arrhythmia. Liver disorders, kidney disorders, respiratory system disorders.

SECTION 5. FIRE FIGHTING MEASURES

Fire Hazard: Negligible fire hazard.

Extinguishing Media: Use extinguishing agents appropriate for surrounding fire.

Fire Fighting: Wear NIOSH approved positive-pressure self-contained breathing apparatus operated in pressure demand mode. Move container from fire area if it can be done without risk. Cool containers with water spray until well after the fire is out. Flood with fine water spray. Do not scatter spilled material with high-pressure water streams. Avoid inhalation of material or combustion by-products. Stay upwind and keep out of low areas.

Component	Immediately Dangerous to Life/ Health (IDLH)
Carbon Tetrachloride 56-23-5	200 ppm IDLH

Hazardous Combustion Products: Hydrogen chloride; Chlorine; Phosgene; Oxides of carbon

Sensitivity to Mechanical Impact: Not sensitive.

Sensitivity to Static Discharge: Not sensitive.

Lower Flammability Level (air): Not applicable

Upper Flammability Level (air): Not applicable

Flash point: Not flammable

Auto-ignition Temperature: Not flammable

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal Precautions: Most vapors are heavier than air and will spread along ground and collect in low or confined areas (drains, basements, tanks). Do not breathe vapors, mist, or spray. Ventilate confined spaces before entering. Exposure in an enclosed or poorly ventilated area may be very harmful. Keep unnecessary people away, isolate hazard area and deny entry. Evacuation of surrounding area may be necessary for large spills. Shut off ventilation system if needed. Do not get in eyes, on skin or on clothing. Wear appropriate personal protective equipment recommended in Section 8 of the SDS.

Environmental Precautions: Keep out of water supplies and sewers. Avoid discharge into drains, surface water

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or groundwater. Releases should be reported, if required, to appropriate regulatory agencies.

Methods and Materials for Clean-up

Recovery: In case of spill or leak, stop the leak as soon as possible. Reuse or reprocess, if possible. Ventilate closed spaces before entering. Completely contain spilled materials with dikes, sandbags, etc. Collect with appropriate absorbent and place into suitable container. Keep container tightly closed. Liquid material may be removed with a properly rated vacuum truck.

Neutralization: Absorb spilled liquids into compatible absorbent materials and place into sealed containers.

Final Disposal: Properly dispose of in accordance with all applicable regulations. For waste disposal, see section 13.

Additional Disaster Prevention Measures: Potential Carbon Tetrachloride exposures have special United States EPA requirements as noted in 40 CFR CHAPTER I SUBCHAPTER R PART 751 SUBPART H.

SECTION 7. HANDLING AND STORAGE

Handling:

Precautions for Safe Handling: Use only outdoors or in a well-ventilated area. Do not use cutting or welding torches, open flames or electric arcs on empty or full containers. Protect from physical damage. Do not enter confined spaces without following proper confined space entry procedures.

Technical measures/precautions: Galvanized steel, aluminum or plastic piping should not be used. Chlorinated organics handling/metering equipment must not be constructed of any reactive metals such as aluminum, zinc, brass, or magnesium alloys. Do not store in aluminum container or use aluminum fittings or transfer lines, as flammable hydrogen gas may be generated. Neoprene and natural rubber parts cannot be used for chlorinated organic service. Gaskets used in the service of chlorinated organics may be constructed of PTFE or Teflon® envelope gasket material or graphite with stainless steel metal inserts. Rubber-based products such as neoprene or Buna N gasketing should not be used. If a composition differing from those mentioned above is to be used, it must first be tested with the specific chlorinated organic product to ensure compatibility.

Prevention of contact: Obtain, read, and follow all safety instructions before use. Do not breathe mist, vapors, or spray. Wash hands and exposed skin and clothing thoroughly after handling. Do not touch eyes. Do not eat, drink, or smoke when using this product. Use only outdoors or in a well-ventilated area. Wear protective gloves, protective clothing, eye, and face protection. Avoid release to the environment. See Section 8, Exposure Controls and Personal Protection, for additional information.

Storage:

Safe Storage Conditions: Store and handle in accordance with all current regulations and standards. Keep container properly labeled and tightly closed. Store in a cool, dry area. Protect from sunlight. Prevent water or moist air from entering storage tanks or containers. Store in a well-ventilated area. Keep separated from incompatible substances (see below or Section 10 of the Safety Data Sheet).

Technical measures: Do not store in aluminum container or use aluminum fittings or transfer lines, as flammable hydrogen gas may be generated. Bulk storage containers should be constructed of either carbon or stainless steel. Aluminum or fiberglass reinforced plastic storage tanks are prohibited for chlorinated organic service. Storage tanks should not be constructed of, nor contain, any non-compatible plastic components. All storage facilities should be

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designed to protect the environment from contamination through the use of secondary containment. Typical secondary containment systems employ impermeable surfaces such as double-walled tanks, sumps, dikes (non-earth). All storage tanks should be diked to contain the tank contents in the event of a spill or tank rupture. Containment should be large enough to contain the tank's volume and an additional appropriate volume as a safety factor. Containment volumes and diking requirements are often defined and mandated by individual states and localities. Regulations must be reviewed prior to construction.

Incompatible Substances: Acids, Bases, Oxygen, Peroxides, Alkali metals, Reactive metals, Aluminum, Sodium, Potassium, Oxidizing agents.

Packaging or Materials of Construction: Carbon steel of welded construction is the usual material for storage and handling of chlorinated solvents in bulk tanks. If rust contamination cannot be tolerated, an appropriate grade of stainless steel may be preferred; hot-dip galvanized steel (though not steel galvanized by electroplating or spraying) should be suitable, or a coating may be applied to the steel. A certificate of the suitability of the coating should be obtained from the supplier/manufacturer.

Additional Information:

Harms public health and the environment by destroying ozone in the upper atmosphere. Carbon Tetrachloride may react explosively with reactive metals such as the alkali metals, aluminum, magnesium, and zinc. It can also react violently with boron and silicon hydrides, and upon heating with DMF. Carbon Tetrachloride decomposes with UV light which can lead to the formation of carbon dioxide, hydrochloric acid, and phosgene.

SECTION 8. EXPOSURE CONTROLS / PERSONAL PROTECTION**REGULATORY EXPOSURE LIMIT(S):**

Listed below for the product components that have regulatory occupational exposure limits (OEL's). See 40 CFR Chapter I Part 751 Subpart H Carbon Tetrachloride Risk Management Rule for additional requirements when any Carbon Tetrachloride exposures are at or above the EPA Existing Chemical Exposure Limit (ECEL) action level (0.02 ppm) or 8-hour time-weighted average (TWA) ECEL (0.03 ppm).

Component	EPA ECEL Action Level	EPA ECEL	EPA STEL
Carbon Tetrachloride	0.02 ppm (8-hr TWA) See 40 CFR Chapter I Part 751 Carbon Tetrachloride	0.03 ppm (8-hr TWA) See 40 CFR Chapter I Part 751 Carbon Tetrachloride	None

Existing Chemical Exposure Level (ECEL) is the concentration at which an adult human would be unlikely to suffer adverse effects if exposed for a working lifetime, including susceptible subpopulations, as determined by EPA. EPA has determined as a matter of risk management policy that ensuring exposures remain at or below the ECEL will eliminate the unreasonable risk of injury to health from occupational inhalation exposures for conditions of use identified as presenting unreasonable risk under TSCA.

Component	OSHA Final PEL TWA	OSHA Final PEL STEL	OSHA Final PEL Ceiling
Carbon Tetrachloride	10 ppm (TWA)	-----	25 ppm (Ceiling)

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56-23-5 (99.5 - 100 %)			
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OEL: Occupational Exposure Limit; OSHA: United States Occupational Safety and Health Administration; PEL: Permissible Exposure Limit; TWA: Time Weighted Average; STEL: Short Term Exposure Limit
 OSHA Ceiling values indicate the exposure limit, which at no time shall be exceeded. Instantaneous monitoring is the preferred method to determine compliance with OSHA Ceiling values. If instantaneous monitoring is not feasible, then the ceiling shall be assessed as a 15-minute time weighted average exposure which shall not be exceeded at any time during the working day [29 CFR § 1910.1000(a)(1)]

Component	Canada - TWAs	Canada - STELs	Canada - Ceilings
Carbon Tetrachloride 56-23-5 (99.5 - 100 %)	Ontario - 2 ppm (TWA) Alberta - 5 ppm (TWA) Alberta - 31 mg/m ³ (TWA) British Columbia - 2 ppm (TWA)	Ontario - 3 ppm (STEL)	-----

NON-REGULATORY EXPOSURE LIMIT(S):

Listed below are the product components that have advisory (non-regulatory) occupational exposure limits (OEL's) established.

Component	ACGIH TWA	ACGIH STEL	ACGIH Ceiling	Skin Absorption - ACGIH	NIOSH RELs	AIHA WEELs	OSHA TWA (Vacated)	OSHA STEL (Vacated)	OSHA Ceiling (Vacated)
Carbon Tetrachloride 56-23-5 (99.5 - 100 %)	5ppm TWA	10 ppm (STEL)	-----	Listed	2 ppm (STEL) 12.6 mg/m ³ (STEL)	-----	2 ppm 12.6 mg/m ³	-----	-----

- The Non-Regulatory United States Occupational Safety and Health Administration (OSHA) limits, if shown, are the Vacated 1989 PEL's (vacated by 58 FR 35338, June 30, 1993).

- The American Conference of Governmental Industrial Hygienists (ACGIH) is a voluntary organization of professional industrial hygiene personnel in government or educational institutions in the United States. The ACGIH develops and publishes recommended occupational exposure limits each year called Threshold Limit Values (TLVs) for hundreds of chemicals, physical agents, and biological exposure indices.

ENGINEERING CONTROLS: Use closed systems. Provide local exhaust ventilation where vapor or mist may be generated. Handle product only in closed system or provide appropriate exhaust ventilation at machinery. In case of insufficient ventilation, wear suitable respiratory equipment. All process sampling must be performed using a closed loop sampling system. Ensure compliance with applicable exposure limits. Monitoring should be performed in accordance with 40 CFR CHAPTER I SUBCHAPTER R PART § 751.707(b), Exposure Monitoring under EPA'S Carbon Tetrachloride Risk Management Rule, to determine compliance with applicable exposure level(s).

WORKPLACE CHEMICAL PROTECTION PROGRAM (WCPP): A workplace chemical protection program (WCPP) is required in order to continue 9 conditions of use of Carbon Tetrachloride, including manufacturing and processing for export, except to the extent the conditions of use are prohibited by § 751.705. These uses include:

- (1) Domestic manufacture, except where Carbon Tetrachloride is manufactured solely as a byproduct.
- (2) Import.
- (3) Processing as a reactant in the production of hydrochlorofluorocarbons, hydrofluorocarbons, hydrofluoroolefins

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and perchloroethylene.

(4) Processing: Incorporation into formulation, mixture, or reaction products for agricultural products manufacturing, vinyl chloride manufacturing, and other basic organic and inorganic chemical manufacturing.

(5) Processing: Repackaging for use as a laboratory chemical.

(6) Processing: Recycling.

(7) Industrial and commercial use as an industrial processing aid in the manufacture of agricultural products and vinyl chloride.

(8) Industrial and commercial use in the elimination of nitrogen trichloride in the production of chlorine and caustic soda and the recovery of chlorine in tail gas from the production of chlorine.

(9) Disposal.

- Details of these requirements are in 40 CFR Part 751, subpart B, available at <https://www.ecfr.gov/current/title40/part-751/subpart-B>.

- The WCPP requires that owners and operators of facilities using Carbon Tetrachloride take appropriate measures to meet new inhalation exposure limits (including 0.03 ppm as an 8-hour time weighted average) and develop and implement an exposure control plan, among other requirements.

- For more detailed information on the WCPP requirements for Carbon Tetrachloride, see 40 CFR § 751.707

Applicability of the WCPP:

- The provisions of the WCPP only apply to chemical substances as defined under TSCA section 3, which excludes "any food, food additive, drug, cosmetic, or device (as such terms are defined in Section 201 of the Federal Food, Drug, and Cosmetic Act [21 U.S.C. 321]) when manufactured, processed, or distributed in commerce for use as a food, food additive, drug, cosmetic, or device" and "any pesticide (as defined in the Federal Insecticide, Fungicide, and Rodenticide Act [7 U.S.C. 136 et seq.]) when manufactured, processed, or distributed in commerce for use as a pesticide".

- The provisions of the WCPP do not apply when Carbon Tetrachloride is solely present unintentionally in trace quantities with another chemical substance or mixture, whether as a manufacturing residue, unreacted feedstock, byproduct, or other contaminant. This is considered the "trace quantities exclusion" identified in § 751.701(b)

PERSONAL PROTECTIVE EQUIPMENT:

Eye Protection: Wear chemical safety goggles with a face shield to protect against eye and skin contact when appropriate. Provide an emergency eyewash fountain and quick drench shower in the immediate work area.

Skin and Body Protection: Wear chemical resistant clothing to prevent skin contact. Contaminated clothing should be removed, then discarded or laundered. Provide and require the use of dermal PPE that separates and provides an impervious barrier to prevent skin contact with Carbon Tetrachloride (CTC) to each person who is reasonably likely to be exposed in the work area through direct dermal contact with CTC. Direct dermal contact means direct handling of CTC (including a mixture or product containing CTC) or skin contact with surfaces that may be contaminated with CTC (e.g., equipment or materials on which CTC may be present) under routine conditions in the workplace (see 40 CFR § 751.5 for definition of direct dermal contact). Select and provide appropriate dermal PPE based on an evaluation of the performance characteristics of the dermal PPE relative to the task(s) to be performed, conditions present, and the duration of use. To find a more thorough description of the CTC dermal protection requirements, see 40 CFR § 751.707 pursuant to paragraphs (c) or (d)(1)(ii)(B) and § 751.709(b)(3) or (4).

Hand Protection: This material may be absorbed across the skin causing systemic effects. Wear appropriate chemical resistant gloves that are tested for protection from Carbon Tetrachloride when potential for dermal exposure is possible. Consult a glove supplier for assistance in selecting an appropriate chemical resistant glove. The selection of a specific glove for a particular application and duration of use in a workplace should also take into account all relevant workplace factors like other chemicals which may be handled, physical requirements

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(cut/puncture protection, dexterity, thermal protection), potential body reactions to glove materials, as well as the instructions/specifications provided by the glove supplier. Donning of gloves that are chemically resistant to Carbon Tetrachloride with activity-specific training where dermal contact with Carbon Tetrachloride is possible must be included in a facility specific Workplace Chemical Protection Program (WCPP) (see 40 CFR Part § 751.707 for details of what constitutes an appropriate WCPP).

Protective Material Types: Polyvinyl alcohol (PVA), Nitrile.

Respiratory Protection: Where vapor or mist concentration exceeds or is likely to exceed the EPA ECEL, a NIOSH approved respirator is required according to the selection criteria outlined in 40 CFR § 751.707(f)(2). When an air-purifying respirator is not adequate, for exposures above 30 ppm, or for spills and/or emergencies of unknown concentrations, a NIOSH approved self-contained breathing apparatus or airline respirator with full-face piece with auxiliary self-contained escape pack is required. A respiratory protection program that meets 29 CFR 1910.134 must be followed whenever workplace conditions warrant use of a respirator. Respiratory protection requirements for Carbon Tetrachloride are in 40 CFR Part § 751.707(f)(2).

Component	Immediately Dangerous to Life/ Health (IDLH)
Carbon Tetrachloride 56-23-5 (99.5 - 100 %)	200 ppm IDLH

Other Protective Equipment: Provide an emergency eyewash fountain and quick drench shower in the immediate work area.

HYGIENE MEASURES: Obtain, read, and follow all safety instructions before use. Do not breathe mist, vapors, or spray. Wash hands and exposed skin and clothing thoroughly after handling. Do not touch eyes. Do not eat, drink, or smoke when using this product. Use only outdoors or in a well-ventilated area. Wear protective gloves, protective clothing, eye, and face protection.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State:	Liquid
Color:	Colorless
Odor:	Mildly sweet odor Characteristic, ether-like odor
Odor Threshold [ppm]:	Odor recognition in air for chemically pure is 21.4 ppm; however, can be as high as 250 ppm
Melting Point/Range:	-23 (°C)
Freezing Point/Range:	-9 °F (-23 °C)
Boiling Point °C	76.8°C
Evaporation Rate (ether=1):	0.3
Flammability (solid, gas):	Not applicable
Lower Flammability Level (air):	Not applicable
Upper Flammability Level (air):	Not applicable
Explosion limits:	Non-explosive
Flash point:	Not flammable
Auto-ignition Temperature:	Not flammable

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Decomposition Temperature:	Not determined.
pH:	No data available
Viscosity:	No data available
Dynamic viscosity:	2.03 mPa·s at -23°C
Kinematic viscosity:	No data available
Water Solubility:	793 mg/L at 25°C
Partition Coefficient (n-octanol/water):	2.83
Vapor Pressure:	115 mm Hg at 25°C
Density:	13.26 lbs./gallon
Relative Density/Specific Gravity (water=1):	1.59 @ 25 °C
Vapor Density (air=1):	5.32
Particle Size Distribution:	Not applicable

Other Information

Molecular Formula:	C-Cl ₄
Chemical Family:	Aliphatic halogenated solvent
Molecular Weight:	153.8
Explosive properties:	Not applicable.
Oxidizing properties:	Not applicable.
Volatility:	100%
Surface tension:	3.23X10 ⁻² N/m @ 25.33 K

SECTION 10. STABILITY AND REACTIVITY

Chemical Stability: Stable at normal temperatures and pressures.

Reactivity: Not reactive under normal temperatures and pressures. May react explosively with alkali metals.

Possibility of Hazardous Reactions: The chemical is incompatible with metals that are chemically active (for example barium, lithium, beryllium, and aluminum) and oxidizers. Carbon Tetrachloride can react with active metals, leading to the formation of corrosive gases like hydrogen chloride and phosgene. Avoid heat, flames, sparks, and other sources of ignition. Containers may rupture or explode if exposed to heat. Avoid contact with incompatible substances and conditions due to generation of phosgene and other toxic and irritating substances.

Conditions to Avoid (e.g., static discharge, shock, or vibration): No information available.

Incompatible Substances: Acids, Bases, Oxygen, Peroxides, Alkali metals, Reactive metals, Aluminum, Sodium, Potassium, Oxidizing agents.

Hazardous Decomposition Products: Hydrogen Chloride, Chlorine, Phosgene, Oxides of Carbon.

Hazardous Polymerization: Will not occur.

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SECTION 11. TOXICOLOGICAL INFORMATION

POTENTIAL HEALTH EFFECTS:

ACUTE TOXICITY:

Acute inhalation and oral exposures to high levels of Carbon Tetrachloride have been observed primarily to damage the liver (swollen, tender liver, changes in enzyme levels, and jaundice) and kidneys (nephritis, nephrosis, proteinuria) of humans. Depression of the central nervous system has also been reported. Symptoms of acute exposure in humans include headache, weakness, lethargy, nausea, and vomiting. Delayed pulmonary edema (fluid in lungs) has been observed in humans exposed to high levels of Carbon Tetrachloride by inhalation and ingestion, but this is believed to be due to injury to the kidney rather than direct action of Carbon Tetrachloride on the lung. Acute animal exposure tests in rats, mice, rabbits, and guinea pigs have demonstrated Carbon Tetrachloride to have low toxicity from inhalation exposure, low-to-moderate toxicity from ingestion, and moderate toxicity from dermal exposure.

Eye contact: Vapors may cause mild eye irritation with tearing, redness, or a stinging or burning feeling. Liquids or mist cause severe irritation with redness and pain.

Skin contact: May cause skin irritation with redness, an itching or burning feeling, and swelling of the skin. May be absorbed through the skin to cause effects as detailed in inhalation.

Inhalation: May cause respiratory tract irritation. Breathing this material is harmful and may cause death depending upon level and duration of exposure. Breathing excessively high concentrations of this material can have a direct sensitizing effect on the heart which may lead to irregular heartbeats that may cause death. Exposure leads to rapid depression of the central nervous system. Alcohol consumption increases the toxic effects.

Ingestion: May be harmful if swallowed. Lung aspiration hazard if swallowed. Lung aspiration may result in chemical pneumonitis, pulmonary edema, and damage to lung tissue or death.

CHRONIC TOXICITY:

Chronic inhalation or oral exposure to Carbon Tetrachloride produces liver and kidney damage in humans and animals. No information is available on the reproductive effects of Carbon Tetrachloride in humans. Limited epidemiological data have indicated a possible association between certain birth outcomes (e.g., birthweight, cleft palate) and drinking water exposure. However, as the water contained multiple chemicals, the role of Carbon Tetrachloride is unclear. Decreased fertility and degenerative changes in the testes have been observed in animals exposed to Carbon Tetrachloride by inhalation. Birth defects have not been observed in animals exposed to Carbon Tetrachloride by inhalation or ingestion. Occasional reports have noted the occurrence of liver cancer in workers who had been exposed to Carbon Tetrachloride by inhalation exposure; however, the data are not sufficient to establish a cause-and-effect relationship. Liver tumors have developed in rats and mice exposed to Carbon Tetrachloride by gavage (experimentally placing the chemical in their stomachs). EPA has classified carbon tetrachloride as a Group B2, probable human carcinogen.

Chronic Effects: Chronic overexposure is known to cause liver and kidney damage in animals and humans. Toxic amounts may be absorbed through the skin to cause chronic health effects. As in acute exposures, drinking alcohol may increase the potential for toxic effects. Persons suffering from malnutrition also might be more sensitive. Repeated or prolonged contact may result irritation and dermatitis due to the defatting action on the skin. Effects on vision have been observed in some cases. May cause cancer based on animal data. In animal studies, blood disorders and male reproductive effects have been observed. The relevance of these observations to humans is not clear at this time. Sufficient evidence in animals of fetal toxicity at maternally toxic doses.

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SIGNS AND SYMPTOMS OF EXPOSURE:

Inhalation (Breathing): Respiratory System Effects: Central Nervous System (CNS) effects are characteristic following inhalation of chlorinated hydrocarbons and can range from lightheadedness at low level exposures to loss of consciousness at high levels. CNS effects are an early warning that exposure to high levels has occurred and there is risk of cardiac effects (palpitations, low blood pressure, arrhythmia, arrest). CNS effects include the following symptoms: abdominal pain, nausea, vomiting, headache, lightheadedness, blurry or double vision, personality changes, weakness, slurred speech, stupor, incoordination (disequilibrium, ataxia), coma, and respiratory arrest. May irritate upper airways. Pulmonary edema and liver and kidney injury can be delayed by days.

Skin: Skin Irritation. Skin exposure may cause burning and prickling sensations, itching, irritation, red skin, edema, small peripheral blisters.

Eye: Eye Irritation. Eye exposure may cause irritation, tearing, pain, conjunctivitis, clouding of cornea.

Ingestion (Swallowing): Ingesting this material may cause gastrointestinal irritation, central nervous system (CNS) depression, CNS symptoms such as sedation, headache, tremor, vision disturbances, memory problems, nausea, vomiting, headache, breathing difficulty, reduced blood pressure, tachycardia, oliguria or anuria, severe liver injury (See Section 11). Ingestion may cause unconsciousness and death.

Interaction with Other Chemicals Which Enhance Toxicity: There is substantial evidence that the toxicity of Carbon Tetrachloride is dramatically increased by alcohols, ketones and a variety of other chemicals. Many of these might be found at hazardous waste sites also containing Carbon Tetrachloride. Although the precise mechanisms for this marked potentiation are not always known, it is likely that most potentiators act, at least in part, by increasing the metabolic activation of Carbon Tetrachloride to its toxic intermediates and metabolites, thus increasing the induced injury. Other agents may affect the toxic outcome by altering cellular regenerative and tissue repair capacities. The extent to which either or both of these mechanisms are involved in the interaction will substantially affect the relationships among induced injury, duration of toxic damage, and animal survival. Interactions with agents enhancing lipid peroxidation would be expected to increase the severity of cell injury due to increased permeability of cell membranes. General and liver toxicity is significantly increased by alcohols, ketones and other chemicals that use the same metabolic pathways: acetaminophen, phenobarbital, methamphetamine, barbiturates, brominated or chlorinated solvents, DDT, PBB, chlordecone, nicotine, carbon disulfide, or other alkyl disulfides. Hypoxia may also increase sensitivity to toxicity. May potentiate other agents that cause Central Nervous System (CNS) depression and respiratory system depression. Catecholamine administration MAY pose increased risk of cardiac arrhythmias.

GHS HEALTH HAZARDS:

GHS: CONTACT HAZARD - SKIN: Category 2 - Causes skin irritation

GHS: CONTACT HAZARD - EYE: Category 2B - Causes eye irritation

GHS: ACUTE TOXICITY - ORAL: Category 5 - May be harmful if swallowed

GHS: ACUTE TOXICITY - INHALATION: Category 4 - Harmful if inhaled

GHS: TARGET ORGAN TOXICITY (SINGLE EXPOSURE):

Category 1 - Causes damage to Liver, Kidney, and Lungs

Category 3 - May cause drowsiness or dizziness

GHS: TARGET ORGAN TOXICITY (REPEATED EXPOSURE):

Category 1 - Causes damage to Liver and Kidney through prolonged or repeated exposure

GHS: ASPIRATION HAZARD: Category 1 - May be fatal if swallowed and enters airways

GHS: CARCINOGENICITY: Category 2 - Suspected of causing cancer

TOXICITY DATA:

PRODUCT TOXICITY DATA: Product level testing data as noted below:

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LD50 Oral: 2350 mg/kg oral-rat LD50	LD50 Dermal: >15 gm/kg skin-rabbit LD50	LC50 Inhalation: 8000 ppm (4 hr. - Rat)
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COMPONENT TOXICITY DATA: The component toxicity data is populated by the LOLI database and may differ from the product toxicity data given

Component	Oral LD50	Dermal LD50	Inhalation LC50
Carbon Tetrachloride 56-23-5	2350 mg/kg (Rat)	5070 mg/kg (Rat)	8000 ppm (4-h Rat)
Chloroform 67-66-3	450 mg/kg (Rat)	>20 g/kg (Rabbit)	47702 mg/m ³ (4-h Rat)
Tetrachloroethylene [Perc] 127-18-4	2629 mg/kg (Rat)	No data available	27.8 mg/L (4-h Rat)
Trichloroethylene 79-01-6	4920 mg/kg (Rat)	29000 mg/kg (Rabbit)	26 mg/L (4-h Rat)
Ethylene Dichloride 107-06-2	680 mg/kg (Rat)	4890 mg/kg (Rabbit)	4 mg/L (6-h Rat)
1,1,2- Trichloroethane 79-00-5	836 mg/kg (Rat)	5371 mg/kg (Rabbit)	2.78 mg/L (8-h Rat)
Methylene Chloride (Dichloromethane) 75-09-2	1600 mg/kg (Rat)	>2000 mg/kg (Rat)	53 mg/L (6-h Rat)

EYE IRRITATION/CORROSION: Very light reddening and edema of the conjunctiva without cornea damage after 24 hours of applying 0.1 ml to conjunctiva sac of rabbits. No abnormal findings were detected after 48 hours. This product is classified as causing serious eye irritation (Category 2B) per GHS criteria.

Standard Draize (Eye): 2.2 mg/30 second(s) eyes-rabbit mild; 500 mg/24 hour(s) eyes-rabbit mild.

SKIN IRRITATION/CORROSION: There are reports of “moderately irritating” results in skin irritation tests using rabbits and guinea pigs. The product is classified as cutaneous irritant (Category 2), according to GHS classification criteria.

Standard Draize (Skin): 4 mg skin-rabbit mild; 500 mg/24 hour(s) skin-rabbit mild

SKIN ABSORBENT/DERMAL ROUTE: Yes.

The level of dermal absorption from the gaseous phase is low. The rate of dermal absorption of liquid Carbon Tetrachloride by intact mouse skin was found to be 8.3 ug/cm² a minute. Direct skin exposure to a high dose of Carbon Tetrachloride (CCl₄) can cause systemic effects.

RESPIRATORY OR SKIN SENSITIZATION: There is weak evidence of dermal sensitization in mice using the Local Lymph Node Assay (LLNA) test. Not classified as a skin or respiratory sensitizer per GHS criteria.

CARCINOGENICITY: A number of epidemiological studies have evaluated the association between occupational exposure to Carbon Tetrachloride and cancer risk. Evidence remains inadequate to make definitive conclusions about the carcinogenicity of carbon tetrachloride in humans. In animal studies, Carbon Tetrachloride has induced hepatocellular carcinomas in rodents via all exposure routes. With sufficient evidence of carcinogenicity in experimental animals such as this, and limited evidence of carcinogenicity in humans, various agencies have

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concerns about the risks for cancer from Carbon Tetrachloride (CCl₄) exposure.

- The International Agency for Research on Cancer [IARC 1999] has determined that CCl₄ is possibly carcinogenic to humans (Group 2B)
- The National Institute for Occupational Safety and Health (NIOSH) has identified CCl₄ as a potential occupational human carcinogen [NIOSH 2005]
- The American Conference of Governmental Industrial Hygienists (ACGIH) considers CCl₄ to be a suspected human carcinogen [ACGIH 2016]
- The National Toxicology Program reports that CCl₄ is reasonably anticipated to be a human carcinogen [NTP 2016].

Component	NTP:	IARC (GROUP 1):	IARC (GROUP 2):	OSHA:	ACGIH (American Conference of Governmental Industrial Hygienists)	NIOSH - Pocket Guide - Carcinogens
Carbon Tetrachloride	Reasonably Anticipated To Be A Human Carcinogen		Group 2	Listed	A2 - Suspected Human Carcinogen	potential occupational carcinogen

SPECIFIC TARGET ORGAN TOXICITY (Single Exposure): Regardless of the route of absorption, the clinical picture of Carbon Tetrachloride intoxication is dominated in the first 24 hours by gastrointestinal and neurological symptoms. Liver damage occurs at the earliest after 24 hours. In severe cases ascites and hepatic coma develop and are often accompanied by hemorrhage. Kidney damage is first manifest after 2-3 days, often not until 2-3 weeks after the intoxication. Pulmonary edema is a common finding in humans exposed to lethal levels of Carbon Tetrachloride in air. Thirteen fatal cases were reported following acute inhalation exposure in humans. Inhalation of carbon tetrachloride leads to rapid depression of the central nervous system. Depending on exposure levels, common signs of central nervous system effects include headache, giddiness, weakness, lethargy, and stupor.

SPECIFIC TARGET ORGAN TOXICITY (Repeated or Prolonged Exposure): Carbon Tetrachloride is a powerful hepatotoxic agent in humans and animals. The principal clinical signs of liver injury are swollen and tender liver, elevated levels of hepatic enzyme (aspartate aminotransferase) in the serum, elevated serum bilirubin levels and the appearance of jaundice, and decreased serum levels of proteins such as albumin and fibrinogen. In addition, repeated chronic exposure leads in some cases to fibrosis and/or cirrhosis of the liver. Chronic exposure (6 hours/day, 5 days/week for 2 years) to Carbon Tetrachloride vapor caused renal effects in rodents, with rats being more sensitive than mice.

INHALATION HAZARD: This product is classified as HARMFUL IF INHALED (Category 4) per GHS criteria. Signs of respiratory damage appear to be exceedingly rare in human case reports. However, autopsies of humans and pathological evaluations in animal studies consistently show numerous gross and histological findings, including pulmonary edema; interstitial and alveolar hemorrhage; epithelial cell damage and death; alveolar infiltrates; damage to pulmonary vasculature; alveolar wall thickening, and fibrosis. The mechanism of pulmonary toxicity is multifactorial and includes direct bioactivation of CCl₄ to CCl₃ and other free radicals by cytochrome P450 enzymes in the lung parenchyma, specifically by CYP2E1; hepatopulmonary syndrome, and direct and indirect oxidative stress.

INGESTION HAZARD: Lethal doses of Carbon Tetrachloride ingestion vary widely, with alcohol ingestion increasing the risk. Fatalities have been reported with doses ranging from 5.3 mL to 150 mL, with some cases involving only 1.5 mL. In animal studies, an LD₅₀ value of approximately 13,000 mg/kg was reported for mice, and protein depletion in rats led to increased sensitivity. Single doses as low as 400 mg/kg have resulted in the death of cats. Overall, sensitivity to Carbon Tetrachloride oral toxicity appears to depend on both the dose and the presence of other factors

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such as alcohol consumption and protein levels.

GERM CELL/IN-VITRO MUTAGENICITY: Carbon Tetrachloride has been extensively studied for its genotoxic and mutagenic effects, with largely negative results. When such changes have been seen, they have generally been related to hepatic cytotoxicity. Mutagenic effects, if they occur, would likely be generated through indirect mechanisms resulting from oxidative and lipid peroxidative damage.

REPRODUCTIVE TOXICITY: No information is available on the reproductive effects of Carbon Tetrachloride in humans. Effects on the reproductive organs (e.g., testes, uterus, etc.) have not been observed in sub-chronic and chronic animal studies, which suggests that Carbon Tetrachloride is not likely to be a reproductive toxicant, and that any potential reproductive effects could be only induced at much higher doses than liver toxicity.

DEVELOPMENTAL TOXICITY: Limited evidence from gestational exposure studies in animals suggest that developmental toxicity is not an acute effect nor the most sensitive effect for Carbon Tetrachloride. Developmental toxicity has been observed at oral and inhalation doses accompanied by some degree of maternal toxicity. Teratogenicity has not been observed in the offspring of rats orally exposed to Carbon Tetrachloride.

ASPIRATION HAZARD: Category 1 - May be fatal if swallowed and enters airways. Carbon Tetrachloride has a significant aspiration hazard, meaning inhaling its liquid form can lead to severe lung damage due to its ability to be readily absorbed into the lungs, potentially causing chemical pneumonia and other serious health effects, especially when exposure is high; this is primarily due to its central nervous system depressant effects which can impair the swallowing reflex, allowing liquid to enter the airways.

TOXICOKINETICS: Carbon Tetrachloride is rapidly absorbed by any route of exposure. However, it is noted that the dermally absorbed fraction would be negligible for exposures to Carbon Tetrachloride vapor. Once absorbed, Carbon Tetrachloride is widely distributed among tissues, especially those with high lipid content, reaching peak concentrations in <1–6 hours, depending on exposure concentration or dose. Animal studies show that volatile metabolites are released in exhaled air, whereas nonvolatile metabolites are excreted in feces and to a lesser degree, in urine.

METABOLISM: Carbon Tetrachloride is metabolized in the body, primarily by the liver, but also in the kidney, lung, and other tissues containing CYP450 enzymes. Based on reasonably available information, the initial step in biotransformation of Carbon Tetrachloride is reductive dehalogenation: reductive cleavage of one carbon-chlorine bond to yield chloride ion and the trichloromethyl radical. Biotransformation of Carbon Tetrachloride to reactive metabolites, including the trichloromethyl radical, is hypothesized to be a key event in the toxicity of Carbon Tetrachloride.

BIOLOGICAL DISTRIBUTION: Carbon Tetrachloride, being somewhat lipophilic, diffuses from the blood to various organs such as the liver, kidney, brain, and accumulates in adipose tissue. After absorption through the gastrointestinal tract, it undergoes a first-pass effect in the liver, where it is biotransformed and forms adducts with cell macromolecules. The clearance of unmetabolized Carbon Tetrachloride is slowest in adipose tissue compared to internal organs due to passive diffusion. Quantitative differences in tissue concentrations are observed based on the method of administration (inhalation, oral bolus, or gastric infusion). Inhalation exposure results in similar concentrations in the kidney and liver, while bolus delivery can lead to higher blood levels and more severe hepatic injury compared to gradual delivery. Gradual oral intake, such as from contaminated drinking water, may result in less hepatotoxicity than bolus dosing or inhalation.

PATHOGENICITY AND ACUTE INFECTIOUSNESS (ORAL, DERMAL, AND INHALATION): Not applicable.

ENDOCRINE DISRUPTOR: Carbon Tetrachloride is listed on The Endocrine Disruptors Exchange's (TEDX) List of Potential Endocrine Disruptors database of chemicals with the potential to affect the endocrine system. Every

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chemical on the TEDX List has one or more verified citations published, accessible, primary scientific research demonstrating effects on the endocrine system. An increased incidence of pheochromocytomas (a neuroendocrine tumor of adrenal chromaffin cells-derived from neural crest stem cells) associated with carbon tetrachloride by oral and inhalation exposure in male and female mice, but not in rats by either route of exposure, has been observed.

NEUROTOXICITY: No oral animal toxicity studies reported neurotoxicity following exposure to Carbon Tetrachloride. Human reports of exposure to high doses of Carbon Tetrachloride by inhalation or ingestion mentioned headaches, drowsiness, comas, or seizures. In acute inhalation studies, animals exposed to high doses (4600-1200 ppm) of Carbon Tetrachloride experienced stupor, incoordination, and unconsciousness.

IMMUNOTOXICITY: No studies were located regarding immunological effects in humans after oral exposure to Carbon Tetrachloride. Studies in rodents have shown significant suppression of immune function following exposure to Carbon Tetrachloride.

Health Hazards of Significance Not Mentioned in GHS Classification

- Alcohol consumption may increase toxic effects
- May be absorbed through the skin
- Harms public health and the environment by destroying ozone in the upper atmosphere

SECTION 12. ECOLOGICAL INFORMATION**ECOTOXICITY (EC, IC, and LC):**

Component:	Freshwater Fish:	Invertebrate Toxicity:	Algae Toxicity:	Other Toxicity:
Carbon Tetrachloride 56-23-5 (99.5 - 100 %)	*LC50 Pimephales promelas: 36.3 - 47.3 mg/L 96h flow-through *LC50 Pimephales promelas: 9.68 - 11.3 mg/L 96h static *LC50 Lepomis macrochirus: 23 - 33 mg/L 96h static	*1500 ug/L 7 hour(s) EC50 (Regeneration) Flatworm (Dugesia japonica)	No data available	No data available

Aquatic Toxicity:

ACUTE AQUATIC HAZARD - CATEGORY 3: Harmful to aquatic life

CHRONIC AQUATIC HAZARD - CATEGORY 2: Toxic to aquatic life with long lasting effects

FATE AND TRANSPORT:

PERSISTENCE: AIR: Vapor-phase carbon tetrachloride will be degraded in the atmosphere by reaction with photochemically-produced hydroxyl radicals; the half-life for this reaction in air is estimated to be 366 years. Direct carbon tetrachloride photolysis is not important in the troposphere, but irradiation at higher energies (195-254 nm) such as found in the stratosphere, results in degradation and leads to ozone depletion. It is stable in the troposphere with residence time of 30-50 years. WATER: Primary loss will be by evaporation into the atmosphere. This material is not expected to adsorb to suspended solids and sediment in water. This material has a negligible

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rate of hydrolysis. Henry's Law constant is 2.76×10^{-2} atm-cu m/mole. SOIL: This material is expected to have high mobility in soil based upon a Koc of 71.

BIODEGRADATION: The overwhelming evidence suggests that aerobic biodegradation is very slow and anaerobic biodegradation is moderate to rapid.

- 6 to 12 months (soil - estimated)
- 7 days to 12 months (aerobic water)
- 3 days to 4 weeks (anaerobic water)
- 13 days to 19 months (anaerobic wastewater treatment).

BIOCONCENTRATION: 30 ug/L 1-21 hour(s) BCF (Residue) Bluegill (*Lepomis macrochirus*) 52.3 ug/L. This material is not expected to bioconcentrate, with an estimated bioconcentration factor of 3.2-7.4.

BIOACCUMULATIVE POTENTIAL: The screening criterion of octanol/water partition coefficient shows a limited potential for bioaccumulation: $\log K_{ow} = 2.83$. Estimated and measured BCF and BAF values ranging from 19– 40 indicate that carbon tetrachloride has low bioaccumulation potential in aquatic organisms.

MOBILITY IN SOIL: The Koc for carbon tetrachloride was measured to be 71. According to a classification scheme, this Koc value suggests that carbon tetrachloride is expected to have high mobility in soil. The estimated retardation factor range in breakthrough sampling in groundwater has been reported as 1.44 - 1.8.

ADDITIONAL ECOLOGICAL INFORMATION: Carbon Tetrachloride is considered an ozone depleting substance (ODS) and its production and use are controlled under the 1987 Montreal Protocol on Substances That Deplete the Ozone Layer and its amendments (Montreal Protocol Annex B – Group II).

Persistent, Bioaccumulative, and Toxic (PBT) and Very Persistent and Very Bioaccumulative (vPvB)

Assessment: Carbon Tetrachloride meets the T criterion and the P criterion but not the B criterion. Therefore, it is not considered either as a PBT or a vPvB substance.

SECTION 13. DISPOSAL CONSIDERATIONS

Waste from material:

Reuse or reprocess, if possible. Dispose in accordance with all applicable regulations. Subject to disposal regulations.

- Wastewater: Carbon tetrachloride may be contained in wastewater discharged to POTW or other, non-public treatment works for treatment. Industrial wastewater containing carbon tetrachloride discharged to a POTW may be subject to EPA or authorized NPDES state pretreatment programs.
- Solid Waste: Carbon tetrachloride is both a listed and a characteristic hazardous waste. Carbon tetrachloride is a non-specific-source listed hazardous waste under waste number F001 (spent halogenated degreasing solvents) [40 CFR Section 261.31] and a source-specific listed hazardous waste under waste number K016 (heavy ends or distillation residues from the production of carbon tetrachloride, which may contain residual carbon tetrachloride) [40 CFR Section 261.32]. Discarded, commercial-grade carbon tetrachloride is a listed hazardous waste under waste number U211 40 CFR § 261.33.

Container Management:

Dispose of container in accordance with applicable local, regional, national, and/or international regulations. Refer to manufacturer/supplier for information on recovery/recycling. Containers are non-refillable. Do not reuse or refill containers. Offer for recycling if available. Offer for reconditioning if appropriate. Triple rinse container promptly after emptying. Container rinsate must be disposed of in compliance with applicable regulations.

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Contaminated Material:

Carbon tetrachloride is a toxic contaminant under RCRA with waste number D019. A solid waste can be a hazardous waste due to its toxicity characteristic if its extract following the Toxicity Characteristic Leaching Procedure (TCLP) (or the liquid waste itself if it contains less than 0.5% filterable solids) contains at least 0.5 mg/L of carbon tetrachloride [40 CFR Section 261.24]. Contaminated packaging must be disposed of as unused product by a licensed / permitted waste disposal service.

SECTION 14. TRANSPORT INFORMATION

LAND TRANSPORT

U.S. DOT 49 CFR 172.101:

UN NUMBER: UN1846
PROPER SHIPPING NAME: Carbon tetrachloride
HAZARD CLASS/ DIVISION: 6.1
PACKING GROUP: II
LABELING REQUIREMENTS: 6.1
MARINE POLLUTANT: Carbon tetrachloride

RQ (Lbs.): RQ 10 Lbs. (Carbon tetrachloride)

CANADIAN TRANSPORTATION OF DANGEROUS GOODS:

UN NUMBER: UN1846
SHIPPING NAME: Carbon tetrachloride
CLASS OR DIVISION: 6.1
PACKING/RISK GROUP: II
LABELING REQUIREMENTS: 6.1
CAN. MARINE POLLUTANT: Carbon Tetrachloride
RQ (Lbs.): RQ 10 Lbs. (Carbon tetrachloride)

MARITIME TRANSPORT (IMO / IMDG)

UN NUMBER: UN1846
PROPER SHIPPING NAME: Carbon tetrachloride
HAZARD CLASS / DIVISION: 6.1
Packing Group: II
LABELING REQUIREMENTS: 6.1
MARINE POLLUTANT: Carbon Tetrachloride

AIR TRANSPORT (ICAO / IATA)

Special Instructions CAO: IATA Certificate for shipping personnel is required

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SECTION 15. REGULATORY INFORMATION**U.S. REGULATIONS****OSHA REGULATORY STATUS:**

This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

CERCLA SECTIONS 102a/103 HAZARDOUS SUBSTANCES (40 CFR 302.4):

If a release is reportable under CERCLA section 103, notify the state emergency response commission and local emergency planning committee. In addition, notify the National Response Center at (800) 424-8802 or (202) 426-2675.

Component	U.S. DOT Hazardous Substances/ RQs	CERCLA Hazardous Substances / RQs	CERCLA Section 302 EHS EPCRA RQs	Section 302 Threshold Planning Quantity (TPQ)
Carbon Tetrachloride 56-23-5 (99.5 - 100 %)	10 lbs(RQ)	10 lb	Not listed	Not Listed

SARA EHS Chemical (40 CFR 355.30)

Not regulated.

SARA HAZARD CATEGORIES ALIGNED WITH GHS (2018):

Health Hazard - Carcinogen
Health Hazard - Acute Toxin (any route of exposure)
Health Hazard - Skin Corrosion or Irritation
Health Hazard - Serious eye damage or eye irritation
Health Hazard - Specific Target Organ Toxicity (STOT) Single Exposure (SE)
Health Hazard - Aspiration Hazard
Health Hazard - Specific Target Organ Toxicity (STOT) Repeat Exposure (RE)
Health Hazard - HNOC
Physical Hazard - HNOC

EPCRA SECTION 313 (40 CFR 372.65):

The following chemicals are listed in 40 CFR 372.65 and may be subject to Community Right-to Know Reporting requirements.

Component	SARA 313 - Emission Reporting	SARA 313 PBT
Carbon Tetrachloride 56-23-5 (99.5 - 100)	0.1% (de minimis concentration)	Not Listed

DEPARTMENT OF HOMELAND SECURITY (DHS)- Chemical Facility Anti-Terrorism Standards (6 CFR 27):

Product is not regulated under DHS

OSHA PROCESS SAFETY (PSM) (29 CFR 1910.119):

Not regulated.

EPA'S CLEAN WATER AND CLEAN AIR ACTS:

This substance contains the ozone-depleting substance (ODS) Carbon Tetrachloride which is regulated as a Class I controlled substance by the U.S. Environmental Protection Agency. Class I substances have been completely phased out in the U.S., except for exemptions allowed under 40 CFR Part 82 (ODS regulations) and the Montreal Protocol. Those exemptions include feedstock (transformation) uses, destruction, certain process agent uses, and specific essential uses.

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Component	Clean Water Act - Priority Pollutants	CAA - ODS CLASS 1 AND CLASS 2	CAA - Volatile Organic Compounds (VOCs) in SOCM	CAA - HON Rule - Organic HAPs	CAA - Hazard Air Pollutants	CAA - Urban HAPs List (Integrated Urban Strategy)	SNAP - Substitutes for ODS	EPA RMP Toxic or Flammable TPQ
Carbon Tetrachloride 56-23-5 (99.5 - 100 %)	Present	Class I ODS	Present	Present	Present	Not Listed	Not Listed	Not Listed

NATIONAL INVENTORY STATUS**U.S. INVENTORY STATUS: Toxic Substance Control Act (TSCA):**

Component	TSCA Inventory	TSCA ACTIVE LIST	TSCA 12(b)	TSCA/Section 4	TSCA/Section 5	TSCA/Section 6	TSCA/Section 8
Carbon Tetrachloride 56-23-5 (99.5 - 100 %)	Listed	ACTIVE R	Not Listed	Not listed	Not Listed	Chemicals subject to Risk Evaluation	Not listed

Toxic Substance Control Act (TSCA) Restriction of Use:

• After June 16, 2025, this chemical substance (as defined in TSCA section 3(2)) may not be distributed in commerce or processed in greater than trace quantities for the following purposes: Incorporation into formulation, mixture or reaction products in petrochemical-derived manufacturing except in the manufacture of vinyl chloride; Industrial and commercial use as an industrial processing aid in the manufacture of petrochemicals-derived products except in the manufacture of vinyl chloride; Industrial and commercial use in the manufacture of other basic chemicals (including manufacturing of chlorinated compounds used in solvents, adhesives, asphalt, and paints and coatings), except for use in the elimination of nitrogen trichloride in the production of chlorine and caustic soda and the recovery of chlorine in tail gas from the production of chlorine; Industrial and commercial use in metal recovery; Industrial and commercial use as an additive; and beginning December 18, 2025, industrial and commercial specialty uses by the U.S. Department of Defense.

TSCA 12(b):

- THIS PRODUCT IS NOT EXPORTED FROM THE U.S.

Canadian Chemical Inventory: All components are listed.

Component	DSL	NDSL
Carbon Tetrachloride 56-23-5 (99.5 - 100 %)	Listed	Not Listed

STATE REGULATIONS**California Proposition 65:**

This product contains a chemical known to the State of California to cause cancer, and/or birth defects, and/or other reproductive harm.

Component	U.S. - California - Proposition 65 - Carcinogens List	CA. Prop. 65 Teratogen	California Proposition 65 CRT List - Male reproductive toxin:	California Proposition 65 CRT List - Female reproductive toxin:	Massachusetts Right to Know Hazardous Substance List	Rhode Island Right to Know Hazardous Substance List
Carbon Tetrachloride 56-23-5 (99.5 - 100 %)	Listed	Not listed	Not Listed	Not Listed	Listed	Listed

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Component	New Jersey Right to Know Hazardous Substance List	New Jersey Special Health Hazards Substance List	New Jersey - Environmental Hazardous Substance List	Pennsylvania Right to Know Hazardous Substance List	Pennsylvania Right to Know Special Hazardous Substances	Pennsylvania Right to Know Environmental Hazard List
Carbon Tetrachloride	0347	carcinogen	Listed	Listed	Present	Present

CANADIAN REGULATIONS

This product has been classified in accordance with the hazard criteria of the Workplace Hazardous Materials Information System (WHMIS 2015) which includes the amended Hazardous Products Act (HPA) and the Hazardous Product Regulations (HPR).

Component	Canada - CEPA - Schedule I - List of Toxic Substances	Canada - NPRI	Canada - CEPA - Greenhouse Gases (GHG) Subject to Mandatory Reporting	Canadian Chemical Inventory:	NDSL
Carbon Tetrachloride 56-23-5 (99.5 - 100)	Present (018) Present (065)	Part 1, Group A Substance (037)	Not Listed	Listed	Not Listed

SECTION 16. OTHER INFORMATION

Prepared by: Occidental Chemical Corporation - HES&S Product Stewardship Department

Rev. Date: 18-Feb-2025

Reason for Revision:

- Revision includes requirements outlined in EPA's Carbon Tetrachloride Risk Management Rule: United States EPA requirements as noted in 40 CFR CHAPTER I SUBCHAPTER R PART 751 SUBPART H (<https://www.ecfr.gov/current/title-40/chapter-I/subchapter-R/part-751/subpart-H>)
- Updated SECTIONS 1 and 15 based on finalization of EPA's Risk Assessment Evaluation under TSCA Section 6(a)
- SDS format adopts revisions to the Hazardous Products Regulations (HPR) to include revisions to "Section 9: Physical and chemical properties" and ensures classification with at a minimum the seventh revised edition of GHS and certain elements from the eighth revised edition (Revision 8)
- SDS format adopts revisions to the OSHA's 2024 Hazard Communication Rule 29CFR 1910.1200 and ensures classification with at a minimum the seventh revised edition of GHS and certain elements from the eighth revised edition (Revision 8)

IMPORTANT:

Important: The information presented herein, while not guaranteed, was prepared by technical personnel and is true and accurate to the best of our current knowledge. NO WARRANTY OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE, OR WARRANTY OR GUARANTY OF ANY OTHER KIND, EXPRESS OR IMPLIED, IS MADE REGARDING PERFORMANCE, SAFETY, SUITABILITY, STABILITY OR OTHERWISE. This information is not intended to be all-inclusive as to the manner and conditions of use, handling, storage, disposal, and other factors that may involve other or additional legal, environmental, safety or performance considerations, and Occidental Chemical Corporation assumes no liability whatsoever for the use of or reliance upon this information. Appropriate handling and use of the product remains the responsibility of the customer. No suggestions for use are intended as, and nothing herein shall be construed as, a recommendation to infringe any existing patents or to violate any Federal, State, local or foreign laws.

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OSHA Standard 29 CFR 1910.1200 requires that information be provided to employees regarding the hazards of chemicals by means of a hazard communication program including labeling, safety data sheets, training and access to written records. We request that you, and it is your legal duty to, make all information in this Safety Data Sheet available to your employees.

End of Safety Data Sheet