

# SAFETY DATA SHEET



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## PERCHLOROETHYLENE

North America EN  
SDS No.: M47014

Rev. Date: 18-Feb-2025  
Rev. Num. 06

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### SECTION 1. CHEMICAL PRODUCT / COMPANY IDENTIFICATION

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<b>Company Identification:</b>	Occidental Chemical Corporation 14555 Dallas Parkway, Suite 400 Dallas, Texas 75254-4300
<b>24-Hour Emergency Telephone Number:</b>	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
<b>To Request an SDS:</b>	MSDS@oxy.com or 1-972-404-3245
<b>Customer Service:</b>	1-800-752-5151 or 1-972-404-3700
<b>Product Identifier:</b>	<b>PERCHLOROETHYLENE</b>
<b>Trade Name:</b>	PERCHLOROETHYLENE, TECHNICAL; PERCHLOROETHYLENE, FLUOROCARBON (PTAP); PERCHLOROETHYLENE, INDUSTRIAL; PERCHLOROETHYLENE, ISOMERIZATION
<b>Synonyms:</b>	1,1,2,2-TETRACHLOROETHENE; TETRACHLOROETHENE; TETRACHLOROETHYLENE; PERCHLOROETHYLENE; PERCHLOROETHENE
<b>Product Use:</b>	<ul style="list-style-type: none"><li>• Industrial use as a processing aid in catalyst regeneration in petrochemical manufacturing*</li><li>• Industrial processing as a reactant / intermediate in refrigerant manufacturing*</li><li>• Industrial use for metal cleaning*</li><li>• *NOTE: Listed uses are subject to the Workplace Chemical Protection Program (WCPP) requirements of 40 CFR 751.607. Also of note, all listed uses are "Industrial Use" only. No "Commercial Use" of this product is contemplated and all "Commercial Use" of this chemical substance will be formally prohibited under EPA's Perchloroethylene Risk Management Rule after June 27, 2027</li></ul>
<b>Uses Advised Against and/or Restricted:</b>	<ul style="list-style-type: none"><li>• NOT FOR USE IN ANY CONSUMER USE PRODUCTS</li><li>• NOT FOR USE IN DRY CLEANING AND RELATED SPOT CLEANING, WHETHER FOR INDUSTRIAL OR COMMERCIAL USES</li></ul>

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## Restrictions on Use (United States):

- EPA 40 CFR Part 63 National Perchloroethylene Air Emission Standards for Dry Cleaning Facilities restricts/bans the use of Perchloroethylene in dry cleaning operations
- After December 8, 2026 this chemical substance (as defined in TSCA section 3(2))/ product cannot be distributed in commerce to retailers for any use. After March 8, 2027, this chemical substance (as defined in TSCA section 3(2))/product is and can only be distributed in commerce or processed with a concentration of PCE (Perchloroethylene) equal to or greater than 0.1% by weight for the following purposes: (1) Processing as a reactant/intermediate; (2) Processing into formulation, mixture or reaction product; (3) Processing by repackaging; (4) Recycling; (5) Industrial and commercial use as solvent in open-top batch vapor degreasing; (6) Industrial and commercial use as solvent in closed-loop batch vapor degreasing; (7) Industrial and commercial use in maskant for chemical milling; (8) Industrial and commercial use as a processing aid in catalyst regeneration in petrochemical manufacturing; (9) Industrial and commercial use as a processing aid in sectors other than petrochemical manufacturing; (10) Industrial and commercial use as solvent for cold cleaning of tanker vessels; (11) Industrial and commercial use as energized electrical cleaner; (12) Industrial and commercial use in laboratory chemicals; (13) Industrial and commercial use in solvent-based adhesives and sealants; (14) Industrial and commercial use in dry cleaning in 3rd generation machines until December 20, 2027; (15) Industrial and commercial use in all dry cleaning and related spot cleaning until December 19, 2034; (16) Export; and (17) Disposal.

## Other Global Restrictions on Use:

NOT FOR SALE FOR USE IN CONSUMER USE PRODUCTS OR IN DRY CLEANING OR SPOT CLEANING OPERATIONS, WHETHER FOR COMMERCIAL OR INDUSTRIAL USE AND REGARDLESS OF NATIONAL, REGIONAL OR LOCAL REGULATIONS. 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

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## SECTION 2. HAZARDS IDENTIFICATION

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

**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).

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## EMERGENCY OVERVIEW:

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**Color:** Colorless  
**Physical State:** Liquid  
**Odor:** Chloroform-like odor

**Signal Word:** **DANGER**

**MAJOR HEALTH HAZARDS:** MAY BE HARMFUL IF SWALLOWED. MAY BE HARMFUL IF SWALLOWED AND ENTERS AIRWAYS. CAUSES SKIN IRRITATION. CAUSES EYE IRRITATION. MAY CAUSE DROWSINESS OR DIZZINESS. MAY CAUSE CANCER. MAY CAUSE DAMAGE TO LIVER, KIDNEY, IMMUNE AND HEMATOLOGIC SYSTEMS THROUGH PROLONGED OR REPEATED EXPOSURE. CAUSES DAMAGE TO NERVOUS SYSTEM, INCLUDING VISUAL EFFECTS. THIS MATERIAL IS A POTENTIAL ENDOCRINE DISRUPTOR.

**AQUATIC TOXICITY:** TOXIC TO AQUATIC LIFE. HARMFUL TO AQUATIC LIFE WITH LONG LASTING EFFECTS.

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

**HAZARD CLASSIFICATION:**

<b>GHS: CONTACT HAZARD - SKIN:</b>	Category 2 - Causes skin irritation
<b>GHS: CONTACT HAZARD - EYE:</b>	Category 2B - Causes eye irritation
<b>GHS: TARGET ORGAN TOXICITY (SINGLE EXPOSURE):</b>	- Category 1 - Causes damage to nervous system including visual effects - Category 3 - May cause drowsiness or dizziness
<b>GHS: TARGET ORGAN TOXICITY (REPEATED EXPOSURE):</b>	Category 2 - May cause damage to liver, kidney, immune and hematologic systems through prolonged or repeated exposure
<b>GHS: CARCINOGENICITY:</b>	Category 1B - May cause cancer
<b>GHS: HEALTH HAZARDS NOT OTHERWISE CLASSIFIED (HHNOC)</b>	- Acute Toxicity [Oral], Category 5 - May be harmful if swallowed - Aspiration Hazard, Category 2 - Chemicals which cause concern owing to the presumption that they cause human aspiration toxicity hazard
<b>HAZARDS NOT OTHERWISE CLASSIFIED (HNOC):</b>	- AQUATIC TOXICITY - ACUTE: Category 2 (Toxic to aquatic life) - AQUATIC TOXICITY - CHRONIC: Category 3 (Harmful to aquatic life with long lasting effects)

**Unknown Acute Oral Toxicity:**

0.02% of this product consists of ingredient(s) of unknown acute oral toxicity.

**Unknown Acute Dermal Toxicity:**

Not applicable.

**Unknown Acute Inhalation Toxicity:**

0.081% of this product consists of ingredient(s) of unknown acute inhalation toxicity.

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**GHS SYMBOL:** Health hazards, Exclamation mark



**GHS SIGNAL WORD:** DANGER

**GHS HAZARD STATEMENTS:**

**GHS - Health Hazard Statement(s)**

- May be harmful if swallowed
- May be harmful if swallowed and enters airways
- Causes skin irritation
- Causes eye irritation
- May cause drowsiness or dizziness
- May cause cancer
- Causes damage to nervous system, including visual effects
- May cause damage to liver, kidney, immune and hematologic systems through prolonged or repeated exposure

**GHS - Environmental Hazard Statement(s)**

- Toxic to aquatic life
- Harmful to aquatic life with long lasting effects

**GHS - Precautionary Statement(s) - Prevention**

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

**GHS - Precautionary Statement(s) - Response**

- IF SWALLOWED: Get emergency medical help immediately
  - Do NOT induce vomiting
  - IF INHALED: Remove person to fresh air and keep comfortable for breathing
  - IF INHALED: Get medical help if you feel unwell
  - IF ON SKIN: Wash with plenty of soap and water
  - Specific treatment for skin contact (see First Aid information on product label and/or Section 4 of the SDS)
  - If skin irritation occurs: Get medical help
  - Take off contaminated clothing and wash it before reuse
  - 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
  - Get medical help if you feel unwell
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- Specific treatment (see First Aid information on product label and/or Section 4 of the SDS)
- Contain release

**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

**Physical Hazards of Significance Not Mentioned in GHS Classification**

- Perchloroethylene decomposes upon heating and exposure to UV light to give phosgene and HCl
- Reacts violently with finely dispersed light metals (aluminum) and zinc
- Mixtures with finely divided barium or lithium metal can detonate

**Health Hazards of Significance Not Mentioned in GHS Classification**

- Potential endocrine disruptor
- The transfer of tetrachloroethylene in milk was reported in laboratory animals and women

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

Taking into consideration PBT criteria detailed in Annex XIII of REACH and by registrant submitted information, Perchloroethylene meets criteria for persistence (P and vP), but does not meet the criteria for bioaccumulation (B or vB) and toxicity (T)

Overall, Perchloroethylene (PCE) may be persistent or very persistent in the environment. It has moderate potential to accumulate in wastewater biosolids, soil, and sediment, and has low potential to bioaccumulate. In the environment, PCE is expected to largely volatilize to the atmosphere where it may undergo long-range transport and slowly degrade via indirect photolysis

Not B and not vB based on: BCF  $\leq$  2,000 L/kg (the highest observed BCF in fish was 49 l/kg, based on whole body w.wt. in of a flow-through exposure study)

Not T based on: EC10 or NOEC  $\geq$  0.01 mg/L for marine / freshwater organisms (long-term toxicity) Toxicity assessment: The acute effect concentrations for all three trophic levels are much higher than the screening criterion of 0.1 mg/l. It can therefore be expected that Perchloroethylene is not potentially toxic towards aquatic organisms. The chronic effect concentrations for invertebrates and algae were higher than the defined criterion of 0.01 mg/l.

**Endocrine Disruptor Assessment:**

The components in the table below are listed on one or more global endocrine screening lists as noted: The Endocrine Disruptors Exchange's (TEDX) List of Potential Endocrine Disruptors database of chemicals has one or more verified citations published, accessible, primary scientific research demonstrating effects on the endocrine system.

Component	Endocrine Screening List
Tetrachloroethylene [Perc]	EU Endocrine Candidate Group II Chemical EU Endocrine Category: Category 2 EU Environmental Endocrine Category: Category 3 EU Health Endocrine Category: Category 2 TEDX Potential Endocrine List: Present US EPA Endocrine Final Screening List: Present

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Component	Endocrine Screening List
	(SDWA chemical) Japan EXTEND List: Not Currently Tested

See Section 11: TOXICOLOGICAL INFORMATION

## SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Component	Systematic Chemical Name	Common name	CAS Number	Percent [%]
Tetrachloroethylene [Perc] 127-18-4	Ethene, 1,1,2,2-tetrachloro	Perchloroethylene	127-18-4	99.0 - 100.0

## SECTION 4. FIRST AID MEASURES

**General Advice:** If exposed or concerned, or if you feel unwell: Get medical help.

**EYE CONTACT:** 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. IF SKIN IRRITATION OCCURS: GET MEDICAL HELP. Take off contaminated clothing and wash before reuse. See Notes to Physician below and Section 11 for more information.

**INHALATION:** IF INHALED: Remove person to fresh air and keep comfortable for breathing. IF INHALED: Get medical help if you feel unwell. See Notes to Physician below and Section 11 for more information.

**INGESTION:** IF SWALLOWED: Get emergency medical help immediately. Do NOT induce vomiting. This material is an aspiration hazard.

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

**Acute Symptoms/Effects:** Effects resulting from acute (short term) high-level inhalation exposure of humans to Perchloroethylene include irritation of the upper respiratory tract and eyes, kidney dysfunction, and neurological effects such as reversible mood and behavioral changes, impairment of coordination, dizziness, headache, sleepiness, and unconsciousness.

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

**Skin:** Skin Irritation. Skin exposure may cause irritation, rough red, dry skin, edema, blisters.

**Inhalation (Breathing):** The initial effects of exposure to vapor are transient, slight eye irritation and possibly lightheadedness. 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

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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.

**Ingestion (Swallowing):** Ingesting this material may cause gastrointestinal irritation, nausea, vomiting, headache, breathing difficulty, reduced blood pressure, weak and rapid pulse, Central Nervous System (CNS) depression, and Central Nervous System (CNS) symptoms such as sedation, headache, tremor, nystagmus and memory problems. Ingestion may cause unconsciousness and death.

**Other Health Effects:** The distinctive odor of perchloroethylene does not necessarily provide adequate warning. Because perchloroethylene quickly desensitizes olfactory responses, persons can suffer exposure to vapor concentrations in excess of occupational exposure levels without smelling it. Vapors are heavier than air, can collect in low lying areas and cause asphyxiation. CNS effects have been observed at exposures of 100 to 300 ppm. Exposures of 1000 to 1500 ppm for less than 2 hours have caused symptoms of mood changes, slight ataxia, faintness and dizziness. Exposure to higher concentrations for longer periods can lead to collapse, coma, or death.

**Chronic (Delayed) Symptoms/Effects:** The primary effects from chronic (long term) inhalation exposure are neurological, including impaired cognitive and motor neurobehavioral performance. Perchloroethylene exposure may also cause adverse effects in the kidney, liver, immune system and hematologic system, and on development and reproduction. Studies of people exposed in the workplace have found associations with several types of cancer including bladder cancer, non-Hodgkin lymphoma, multiple myeloma. EPA has classified Perchloroethylene as likely to be carcinogenic to humans. Respiratory System Effects: May cause chemical or irritant induced asthma or bronchoconstriction. May cause a chemical pneumonitis. Reduced renal output (oliguria), elevation of liver enzymes, to renal failure and liver failure. May cause effects to the skin such as chronic dermatitis, dermal hypersensitivity. May cause eye damage such as corneal damage, decreased vision. May cause delayed liver and kidney effects. Prolonged exposures may result in memory and concentration impairment, vision disturbances, dizziness, irritability, ataxia (difficulty walking), and peripheral neuropathy.

**Target Organ Effects:** Repeated exposure to more than 200 ppm is associated with neurotoxicity, (central nervous system depression, sleeplessness, irritability), and liver damage; Acute prolonged exposure around the PEL has been associated with local anesthetic effects on the peripheral nervous system, and caused behavioral effects such as hallucinations and distorted perceptions

**Protection of First-Aid Responders:** Protect against inhalation exposure. Do not breathe vapors, mist, or spray. Avoid contact with skin and eyes. Use personal protective equipment (PPE). Refer to Section 8 for specific PPE recommendations. Consider the possibility of high levels of vapors in confined/unventilated spaces or low-lying areas.

**Notes to Physician:** There is no antidote for perchloroethylene poisoning. Treatment consists of support of respiratory and cardiovascular functions. Catecholamine administration after exposure to this compound MAY pose enhanced risk of cardiac arrhythmia. 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. Anti-arrhythmic agents may help prevent recurrent ventricular arrhythmias. Absorption from skin is slow, and unless prevented from evaporating, systemic toxicity is unlikely. This compound is absorbed rapidly by oral administration and causes similar effects to inhalation exposure. Activated charcoal may be administered. Liver injury may be delayed several days after exposure.

**Interaction with Other Chemicals Which Enhance Toxicity:** May potentiate other agents that cause Central

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Nervous System (CNS) depression and respiratory system depression. Liver toxicity may be enhanced by other agents that cause liver damage, such as alcohol, acetaminophen. Catecholamine administration MAY pose increased risk of cardiac arrhythmias.

**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:** Non-flammable liquid.

**Explosive properties:** In fire situation, storage containers and parts of containers may rocket great distances, in many directions. Mixtures with lithium shavings are impact-sensitive and will explode, sometimes violently. The presence of 0.5% of trichloroethylene as impurity in perchloroethylene during unheated drying over solid sodium hydroxide can cause the generation of dichloroacetylene and after subsequent fractional distillation, explode. It should be noted that the maximum amount of trichloroethylene in this product as purchased is 10 ppm (0.001%). Mixtures of dinitrogen tetroxide with tetrachloroethylene are explosive when subjected to shock of 25 g TNT equivalent or less.

**Extinguishing Media:** Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

**Specific Hazards:** Non-combustible, substance itself does not burn but may decompose upon heating to produce corrosive and/or toxic fumes. Containers may explode when heated. Vapors are heavier than air and will collect in low areas.

**Unusual Hazards:** Decomposes slowly on contact with moisture. This produces trichloroacetic acid and hydrochloric acid.

**Fire Fighting:** Avoid inhalation of material or combustion by-products. Wear NIOSH approved positive-pressure self-contained breathing apparatus. Stay upwind and keep out of low areas. Move container from fire area if it can be done without risk. Cool containers with water from unmanned hose holder or monitor nozzles until well after the fire is out. Flood with fine water spray. Do not scatter spilled material with high-pressure water streams. Keep water runoff out of water supplies and sewers (see Section 6 of the SDS).

Component	Immediately Dangerous to Life/ Health (IDLH)
Tetrachloroethylene [Perc] 127-18-4	150 ppm IDLH

**Hazardous Combustion Products:** Not combustible, but if involved in a fire decomposes to produce hydrogen chloride and phosgene

**Products Formed During Combustion and Thermal Degradation:** Thermal decomposition or combustion products: hydrogen chloride, chlorine, phosgene, oxides of carbon

**Sensitivity to Mechanical Impact:** Not sensitive.

**Sensitivity to Static Discharge:** Not sensitive.

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**Lower Flammability Level (air):** Not flammable

**Upper Flammability Level (air):** Not flammable

**Flash point:** Not flammable

**Auto-ignition Temperature:** Not applicable > 650 °C @1 atm

**Physical Hazards of Significance Not Mentioned in GHS Classification**

- Perchloroethylene decomposes upon heating and exposure to UV light to give phosgene and HCl
- Reacts violently with finely dispersed light metals (aluminum) and zinc
- Mixtures with finely divided barium or lithium metal can detonate

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## SECTION 6. ACCIDENTAL RELEASE MEASURES

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**Personal Precautions:** Keep unnecessary and unprotected 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. Do not breathe vapors, mist, or spray. Ventilate closed spaces before entering. Most vapors are heavier than air and will spread along ground and collect in low or confined areas (drains, basements, tanks). Wear appropriate personal protective equipment recommended in Section 8, Exposure Controls / Personal Protection, of the SDS.

**Personal Protective Equipment:** See Section 8 for information on personal protective equipment. Cleanup personnel must wear proper protective equipment. Wear protective gloves, protective clothing, eye, and face protection. Use respiratory protection as required. For Unknown Concentrations or exposures above IDLH (Immediately Dangerous to Life or Health) - Any supplied-air respirator with full facepiece and operated in a pressure-demand or other positive-pressure mode in combination with a separate escape supply. Any self-contained breathing apparatus with a full facepiece.

**Emergency Procedures:** For other than minor leaks, immediately implement the facility's predetermined emergency response plan. Evacuate unnecessary personnel and eliminate all sources of ignition. Stop leak, if possible, without personal risk. Shut off ventilation systems to occupied areas where they can be impacted by vapors picked up by the intake systems.

**Environmental Precautions:** Keep out of water supplies, sewers, and soil. Avoid discharge into drains, surface water or groundwater. Releases should be reported, if required, to appropriate 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.

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

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## SECTION 7. HANDLING AND STORAGE

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### Handling:

**Precautions for Safe Handling:** Most vapors are heavier than air and will spread along ground and collect in low or confined areas (drains, basements, tanks). Use only in well-ventilated areas. Avoid breathing vapor, mist, or spray. Avoid contact with skin, eyes, and clothing. Wear personal protective equipment as described in Exposure Controls/Personal Protection (Section 8) of the SDS. Do not taste or swallow. Wash thoroughly after handling. Do not eat, drink, or smoke in areas where this material is used.

**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. 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, vapor, or spray. Wash hands thoroughly after handling. 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. Store in a well-ventilated area. Store away from open flames, and combustibles. Do not enter confined spaces without following proper confined space entry procedures. Do not store in aluminum container or use aluminum fittings or transfer lines. Protect from sunlight. Do not reuse drum without recycling or reconditioning in accordance with any applicable federal, state, or local laws. Do not use cutting or welding torches, open flames, or electric arcs on empty or full containers. Keep separated from incompatible substances (see below or Section 10 of the Safety Data Sheet).

**Technical measures:** 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 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, Strong oxidizing agents, Oxygen, Peroxides, Reactive Metals (e.g., such as Barium, Lithium, Beryllium, and Aluminum).

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**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, 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:

### Physical Hazards of Significance Not Mentioned in GHS Classification

- Perchloroethylene decomposes upon heating and exposure to UV light to give phosgene and HCl
- Reacts violently with finely dispersed light metals (aluminum) and zinc
- Mixtures with finely divided barium or lithium metal can detonate

## 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 G Perchloroethylene Risk Management Rule for additional requirements when any Perchloroethylene exposures are at or above the EPA Existing Chemical Exposure Limit (ECEL) action level (0.07 ppm) or 8-hour time-weighted average (TWA) ECEL (0.14 ppm).

Component	EPA ECEL Action Level	EPA ECEL	EPA STEL
Tetrachloroethylene [Perc]	0.07 ppm (8-hr TWA) See 40 CFR Chapter I Part 751 Perchloroethylene	0.14 ppm (8-hr TWA) See 40 CFR Chapter I Part 751 Perchloroethylene	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
Tetrachloroethylene [Perc] 127-18-4 (99.0 - 100.0 %)	100 ppm (TWA)	-----	200 ppm { Ceiling}

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
Tetrachloroethylene [Perc] 127-18-4 (99.0 - 100.0 %)	Ontario - 25 ppm (TWA) Alberta - 25 ppm (TWA) Alberta - 170 mg/m <sup>3</sup> (TWA)	Ontario - 100 ppm (STEL)	-----

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Component	Canada - TWAs	Canada - STELs	Canada - Ceilings
	British Columbia - 25 ppm (TWA)		

**NON-REGULATORY EXPOSURE LIMIT(S):**

Listed below for the product components that have non-regulatory occupational exposure limits (OELs).

Component	ACGIH TWA	ACGIH STEL	ACGIH Ceiling	Skin Absorption - ACGIH	NIOSH RELs	AIHA WEELs	OSHA TWA (Vacated)	OSHA STEL (Vacated)	OSHA Ceiling (Vacated)
Tetrachloroethylene [Perc] 127-18-4 (99.0 - 100.0 %)	25ppm TWA	100 ppm (STEL)	-----	-----	-----	-----	25 ppm 170 mg/m <sup>3</sup>	-----	-----

- 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 when possible. 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 40CFR CHAPTER I SUBCHAPTER R PART 751.607(b)(3), Exposure Monitoring under EPA'S Perchloroethylene 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 14 conditions of use of Perchloroethylene, including manufacturing and processing for export, except to the extent the conditions of use are prohibited by § 751.605. These uses include:

1. Domestic manufacturing
2. Import
3. Processing as a reactant/intermediate
4. Processing in incorporation into formulation, mixture, or reaction product
5. Repackaging
6. Industrial and commercial use as solvent for open-top batch vapor degreasing
7. Industrial and commercial use as solvent for closed-loop batch vapor degreasing
8. Industrial and commercial use in maskant for chemical milling
9. Industrial and commercial use in solvent-based adhesives and sealants
10. Industrial and commercial use as a processing aid in catalyst regeneration in petrochemical manufacturing
11. Industrial and commercial use as a processing aid in sectors other than petrochemical manufacturing
12. Industrial and commercial use for cold cleaning of tanker vessels
13. Recycling
14. 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>.

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- The WCPP requires that owners and operators of facilities using Perchloroethylene take appropriate measures to meet new inhalation exposure limits (including 0.14 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 Perchloroethylene, see 40 CFR 751.611(b)(2) and 751.607
- EPA has issued additional guidance about the WCPP, see their manual, titled "A Compliance Guide for the Workplace Chemical Protection Program Under the Toxic Substances Control Act" and other materials related to the WCPP are available at [https://www.epa.gov/assessing-and-managing-chemicals-under-tsca/guidance-regulations-issued-under-toxic\\_substances](https://www.epa.gov/assessing-and-managing-chemicals-under-tsca/guidance-regulations-issued-under-toxic_substances).

**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 only apply when Perchloroethylene is present in a formulation at 0.1% or greater (e.g., the de minimis threshold to account for impurities and the unintended presence of Perchloroethylene).

**PERSONAL PROTECTIVE EQUIPMENT:**

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

**Skin and Body Protection:** Provide and require the use of dermal PPE that separates and provides an impervious barrier to prevent skin contact with Perchloroethylene (PCE) to each person who is reasonably likely to be exposed in the work area through direct dermal contact with PCE. Direct dermal contact means direct handling of PCE (including a mixture or product containing PCE) or skin contact with surfaces that may be contaminated with PCE (e.g., equipment or materials on which PCE may be present) under routine conditions in the workplace (see 40 CFR 751.5). 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. Contaminated clothing should be removed, then discarded or laundered. Always place pants legs over boots. There are additional dermal protection requirements in the EPA Perchloroethylene (PCE) rule that apply to a workplace using PCE as an energized electrical cleaner. To find a more thorough description of these requirements, see 40 CFR 751.611(b)(1)(ii) and 40 CFR 751.607(f)(3).

**Hand Protection:** This material may be absorbed across the skin causing systemic effects. Wear appropriate chemical resistant gloves that are tested for protection from Perchloroethylene 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 consider all relevant workplace factors like other chemicals which may be handled, physical requirements (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 Perchloroethylene with activity-specific training where dermal contact with Perchloroethylene is possible must be included in a facility specific Workplace Chemical Protection Program (WCPP) (see 40 CFR § 751.607(f)(3) for details of dermal protection requirements under the WCPP).

**Protective Material Types:** Polyvinyl alcohol (PVA), Teflon®, Viton®, 4H®/Silver Shield®, CPF® 3,

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Responder®, Trelchem®, Tychem®.

**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 40CFR 751.607(f)(2). When an air-purifying respirator is not adequate, for exposures above 140 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 Perchloroethylene are in 40 CFR Part 751.607(f)(2).

Component	Immediately Dangerous to Life/ Health (IDLH)
Tetrachloroethylene [Perc] 127-18-4 (99.0 - 100.0 %)	150 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 affected skin immediately after handling, before breaks, and at the end of the workday. 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

<b>Physical State:</b>	Liquid
<b>Color:</b>	Colorless
<b>Odor:</b>	Chloroform-like odor
<b>Odor Threshold [ppm]:</b>	27 ppm (causes olfactory fatigue)
<b>Melting Point/Range:</b>	-22.3°C
<b>Freezing Point/Range:</b>	-2 °F (-19 °C)
<b>Boiling Point °C</b>	121.3°C
<b>Evaporation Rate (ether=1):</b>	0.1 (ether=1)
<b>Flammability (solid, gas):</b>	Not flammable
<b>Lower Flammability Level (air):</b>	Not flammable
<b>Upper Flammability Level (air):</b>	Not flammable
<b>Explosion limits:</b>	Non-explosive
<b>Flash point:</b>	Not flammable
<b>Auto-ignition Temperature:</b>	Not applicable > 650 °C @1 atm
<b>Decomposition Temperature:</b>	Not determined.
<b>pH:</b>	No data available
<b>Viscosity:</b>	0.839 cP at 25°C
<b>Viscosity (Liquid):</b>	0.932cP @ 15°C; 0.839cP @ 25°C; 0.657cP @ 50 °C; 0.534cP @ 75°C
<b>Viscosity (Vapor):</b>	9900 cP @ 60 °C
<b>Dynamic viscosity:</b>	0.891 mPa.s (dynamic) at 20 °C
<b>Kinematic viscosity</b>	No data available

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<b>Water Solubility:</b>	206 mg/L at 20°C
<b>Partition Coefficient (n-octanol/water):</b>	log Kow = 3.4 @ 20°C
<b>Vapor Pressure:</b>	13 mmHg @ 20 °C 18.5 mm Hg @ 25 °C (77 °F)
<b>Density:</b>	8.34 lbs./gal.
<b>Relative Density/Specific Gravity (water=1):</b>	1.623 g/cm <sup>3</sup> at 20°C
<b>Vapor Density (air=1):</b>	5.83 (relative to air)
<b>Particle Size Distribution:</b>	Not applicable

## Other Information

<b>Molecular Formula:</b>	C2-Cl4
<b>Chemical Family:</b>	Aliphatic halogenated solvent
<b>Molecular Weight:</b>	165.8
<b>Explosive properties:</b>	Not applicable.
<b>Oxidizing properties:</b>	Not applicable.
<b>Volatility:</b>	100%
<b>Surface tension:</b>	32.3 mN/m

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## SECTION 10. STABILITY AND REACTIVITY

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**Chemical Stability:** Stable at normal temperatures and pressures.

**Reactivity:** Not reactive under normal temperatures and pressures.

**Possibility of Hazardous Reactions:** The chemical is incompatible with metals that are chemically active (for example barium, lithium, beryllium, and aluminum) and oxidizers. Perchloroethylene 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, Strong oxidizing agents, Oxygen, Peroxides, Reactive Metals (e.g., such as Barium, Lithium, Beryllium, and Aluminum).

**Hazardous Decomposition Products:** Thermal decomposition or combustion products: hydrogen chloride, chlorine, phosgene, oxides of carbon.

**Hazardous Polymerization:** Will not occur.

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## SECTION 11. TOXICOLOGICAL INFORMATION

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## POTENTIAL HEALTH EFFECTS:

### TOXICITY:

Chlorinated hydrocarbons can act as simple asphyxiants, posing a risk by their displacement of oxygen in the air, thus causing hypoxic environmental conditions leading to reduced oxygen uptake and hypoxemia. Some direct toxicity is also likely, especially at very high exposure levels. The toxic mechanisms include direct myocardial depression and sensitization of the myocardium to endogenous catecholamines. With very high level, as in inhalation abuse, both direct toxicity and reduced oxygen concentrations may exist and can interact to further increase risk. Sudden death may occur. Effects of low level, accidental exposure to chlorinated aliphatic hydrocarbons are usually limited to mild upper respiratory tract irritation and/or mild CNS effects. Direct pulmonary toxicity is usually of little clinical concern; however, moderate to high levels of exposure may result in significant upper airway irritation, pneumonitis, and CNS depressant effects. Very high exposures may result in severe respiratory depression or failure. Cardiac arrhythmias are generally associated with moderate to severe exposures. Exposure to high levels produces direct liver and kidney toxicity. The onset of elevated liver enzymes and indicators of renal impairment may be delayed.

### ACUTE TOXICITY:

Effects resulting from acute (short term) high-level inhalation exposure of humans to Perchloroethylene include irritation of the upper respiratory tract and eyes, kidney dysfunction, and neurological effects such as reversible mood and behavioral changes, impairment of coordination, dizziness, headache, sleepiness, and unconsciousness.

**Eye contact:** Eye contact may cause tearing, redness, pain, conjunctival irritation, corneal edema, whitening, corneal erosion, decreased vision.

**Skin contact:** Skin contact may cause irritation, rough, red, dry skin, edema, blisters.

**Inhalation:** Inhaling this material may cause sedation, bronchospasm, shortness of breath, lightheadedness, loss of consciousness, cardiotoxicity, palpitations, low blood pressure, arrhythmia, arrest, nausea, vomiting, headache, alterations of light perception, weakness, stupor, incoordination (disequilibrium, ataxia), coma, and respiratory arrest. May irritate upper airways.

**Ingestion:** This material can get into the lungs during swallowing or vomiting. Ingestion of this material may cause gastrointestinal irritation, central nervous system (CNS) depression, central nervous system symptoms such as tremor, ataxia (difficulty walking), and memory problems; nausea, vomiting, headache, difficulty breathing, reduced blood pressure, weak and rapid pulse. Ingestion may cause unconsciousness and death.

### CHRONIC TOXICITY:

The primary effects from chronic (long term) inhalation exposure are neurological, including impaired cognitive and motor neurobehavioral performance. Perchloroethylene exposure may also cause adverse effects in the kidney, liver, immune system and hematologic system, and on development and reproduction. Studies of people exposed in the workplace have found associations with several types of cancer including bladder cancer, non-Hodgkin lymphoma, multiple myeloma. EPA has classified Perchloroethylene as likely to be carcinogenic to humans.

**Chronic Effects:** The carcinogenicity of perchloroethylene has been documented in certain strains of mice and rats exposed by inhalation or oral routes. Other long-term inhalation studies in rats failed to show tumorigenic response. Human data are limited and have not established an association between perchloroethylene exposure and cancer.

## SIGNS AND SYMPTOMS OF EXPOSURE:

**Inhalation (Breathing):** The initial effects of exposure to vapor are transient, slight eye irritation and possibly lightheadedness. 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

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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.

**Skin:** Skin Irritation. Skin exposure may cause irritation, rough red, dry skin, edema, blisters.

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

**Ingestion (Swallowing):** Ingesting this material may cause gastrointestinal irritation, nausea, vomiting, headache, breathing difficulty, reduced blood pressure, weak and rapid pulse, Central Nervous System (CNS) depression, and Central Nervous System (CNS) symptoms such as sedation, headache, tremor, nystagmus and memory problems. Ingestion may cause unconsciousness and death.

### Other Health Effects:

The distinctive odor of perchloroethylene does not necessarily provide adequate warning. Because perchloroethylene quickly desensitizes olfactory responses, persons can suffer exposure to vapor concentrations in excess of occupational exposure levels without smelling it.

Vapors are heavier than air, can collect in low lying areas and cause asphyxiation. CNS effects have been observed at exposures of 100 to 300 ppm. Exposures of 1000 to 1500 ppm for less than 2 hours have caused symptoms of mood changes, slight ataxia, faintness and dizziness. Exposure to higher concentrations for longer periods can lead to collapse, coma, or death.

**Interaction with Other Chemicals Which Enhance Toxicity:** May potentiate other agents that cause Central Nervous System (CNS) depression and respiratory system depression. Liver toxicity may be enhanced by other agents that cause liver damage, such as alcohol, acetaminophen. 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: TARGET ORGAN TOXICITY (SINGLE EXPOSURE):**

Category 1 - Causes damage to nervous system including visual effects

Category 3 - May cause drowsiness or dizziness

**GHS: TARGET ORGAN TOXICITY (REPEATED EXPOSURE):**

Category 2 - May cause damage to liver, kidney, immune and hematologic systems through prolonged or repeated exposure

**GHS: ASPIRATION HAZARD:** Category 2 - May be harmful if swallowed and enters airways

**GHS: CARCINOGENICITY:** Category 1B - May cause cancer

### TOXICITY DATA:

#### PRODUCT TOXICITY DATA:

LD50 Oral:	LD50 Dermal:	LC50 Inhalation:
2629 mg/kg oral-rat LD50	>2000 mg/kg skin-rabbit LD50	5200 ppm (4 hr. - Rat)

#### COMPONENT TOXICITY DATA:

The component toxicity data is populated by the LOLI database and may differ from the product toxicity data given.

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Component	Oral LD50	Dermal LD50	Inhalation LC50
Tetrachloroethylene [Perc] 127-18-4	2629 mg/kg (Rat)	No data available	27.8 mg/L (4-h Rat)
Tripropylene 27215-95-8	2100 mg/kg (Rat)	5000 mg/kg (Rabbit)	No data available
Carbon Tetrachloride 56-23-5	2350 mg/kg (Rat)	5070 mg/kg (Rat)	8000 ppm (4-h Rat)

**EYE IRRITATION/CORROSION:** High concentrations of Perchloroethylene vapor or direct contact with the liquid can cause intense conjunctival and scleral irritation, pain, swelling, lacrimation, and photophobia. This product is classified as causing serious eye irritation (Category 2B) per GHS criteria.

**Standard Draize (Eye):** Draize (rabbit/ dose 500 mg/24hr) "Mild"; Draize (rabbit/ dose 162 mg) "Mild".

**SKIN IRRITATION/CORROSION:** Direct contact with the liquid can cause skin irritation and burns. The product is classified as cutaneous irritant (Category 2), according to GHS classification criteria.

**Standard Draize (Skin):** Draize (rabbit/810mg/24hr); Draize (rabbit/500mg/24hr)

**SKIN ABSORBENT/DERMAL ROUTE:** Yes.

The volatility of Perchloroethylene significantly decreases the expected dermal absorption under non-occluded conditions.

**RESPIRATORY OR SKIN SENSITIZATION:** This material is classified as a skin sensitizer according to Korean REACH regulation's harmonized classification scheme; however, manufacturer GHS self-classification does not indicate this grade of Perchloroethylene is a skin sensitizer. Perchloroethylene is unlikely to be a skin sensitizer based on the mode of action for small molecules, which would include covalent binding to biomolecules (proteins); however, the stabilizer n-Butyl glycidyl ether (BGE) used only in the degreasing grades of perchloroethylene is a skin sensitizer. See SDS for perchloroethylene degreasing grades for additional information. Perchloroethylene has not been widely reported to be a respiratory sensitizer; however, high level exposure might give rise to Reactive Airways Dysfunction Syndrome (RADS).

**CARCINOGENICITY:** Studies of dry-cleaning workers exposed to Perchloroethylene have shown associations between exposure to Perchloroethylene and several types of cancer, specifically bladder cancer, non-Hodgkin lymphoma and multiple myeloma. There is also limited evidence suggestive of associations with esophageal, kidney, cervical and breast cancer. Animal studies have reported an increased incidence of liver tumors in mice, from inhalation and oral exposure, and kidney and mononuclear cell leukemias in rats, via inhalation exposure. EPA has classified Perchloroethylene as likely to be carcinogenic to humans by all routes of exposure based on suggestive evidence in epidemiological studies and conclusive evidence in rats (mononuclear cell leukemia) and mice (increased incidence of liver tumors). The International Agency for Research on Cancer (IARC) has classified perchloroethylene as probably carcinogenic to humans (Group 2A). Classified as Category 1B (May cause cancer) under GHS.

Component	NTP:	IARC (GROUP 1):	IARC (GROUP 2):	OSHA:	ACGIH (American Conference of Governmental Industrial Hygienists)	NIOSH - Pocket Guide - Carcinogens
Tetrachloroethylene	Reasonably		Group 2	Listed	A3 - Confirmed	potential

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[Perc]	Anticipated To Be A Human Carcinogen				Animal Carcinogen with Unknown Relevance to Humans	occupational carcinogen
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**SPECIFIC TARGET ORGAN TOXICITY (Single Exposure):** Data from acute exposure studies in animals and human incidents indicate that short term exposure to Perchloroethylene may cause neurotoxicity which can impair cognitive function and evoke prolonged visual disturbances. In addition, the neurotoxicity effects can include central nervous system depression, including loss of consciousness which can result in death.

**SPECIFIC TARGET ORGAN TOXICITY (Repeated or Prolonged Exposure):** Exposure to concentrations greater than 200 ppm may be associated with neurotoxicity and liver damage. The NOAEL was 800 ppm the NOEL was 200 ppm. Congestion of the lungs was reported in rats exposed intermittently to 1600 ppm for 13 weeks. In mice exposed intermittently at 100 ppm for 103 weeks, acute passive congestion of the lungs was observed. In animals, hypertrophy, fatty degeneration, and peroxisome proliferation characterize liver effects. Kidney effects, including cancer, have been noted in animals, predominantly male rats. The mechanism for the development of kidney effects in rats (protein droplet nephropathy) may differ from that in humans. The major effects from chronic inhalation exposure to Perchloroethylene noted in humans, generally at higher exposure levels, include liver damage, kidney effects, immune and hematologic effects.

**INHALATION HAZARD:** Inhalation of Perchloroethylene vapors can irritate the respiratory tract and cause symptoms such as dizziness, headache, nausea, and lack of coordination. Prolonged exposure may lead to more severe effects, such as kidney and liver disorders.

**INGESTION HAZARD:** Acute Toxicity Estimate (oral) is 2629 mg/kg and meets the GHS classification criteria of more than 2000 mg/kg and less than or equal to 5000 mg/kg. Therefore, this mixture is classified as Category 5 Acute Toxin Oral (may be harmful if swallowed).

**GERM CELL/IN-VITRO MUTAGENICITY:** Perchloroethylene shows little to no genotoxic activity in the absence of metabolic activation. Several metabolites resulting from both the oxidative and conjugation pathways have shown some indication of mutagenic activity in vitro. However, the primary metabolite in the liver, trichloroacetic acid (TCA), has shown little to no genotoxic activity in vitro, but testing of this compound is confounded by the pH changes it induces. In vivo studies examining genotoxicity have shown negative or modest genotoxic effects. Not classified as a mutagen per GHS criteria.

**REPRODUCTIVE TOXICITY:** Some adverse reproductive effects, such as menstrual disorders, altered sperm structure, and reduced fertility, have been reported in studies of workers occupationally exposed to perchloroethylene. However, the evidence is inconclusive. Some studies of residents exposed to drinking water contaminated with perchloroethylene and other solvents during pregnancy suggest an association of perchloroethylene exposure with birth defects, however firm conclusions cannot be drawn due to several limitations of these studies. Not classified as a developmental or reproductive toxicant. In laboratory animal studies, effects on the fetus and reproductive system have been seen only at doses that produced significant toxicity to the parent animal.

**DEVELOPMENTAL TOXICITY:** The epidemiological evidence for developmental effects associated with Perchloroethylene (PCE) exposure is suggestive based on several studies of maternal occupational exposure to PCE that suggest an increased risk of spontaneous abortion at high concentrations. Research involving animals generally corroborates the findings from epidemiological studies regarding developmental effects; however, the data is insufficient for hazard classification.

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**ASPIRATION HAZARD:** When swallowed, Perchloroethylene can be aspirated into the lungs during vomiting, leading to chemical pneumonia and other complications. Category 2 - May be harmful if swallowed and enters airways.

**TOXICOKINETICS:** Human and animal evidence indicates that relatively little of the absorbed Perchloroethylene is metabolized; the fraction of the absorbed dose which is metabolized decreases with increasing dose in a manner consistent with saturable metabolism. Maximum rates of metabolism have been measured in mice in which 25% of a low dose (20 mg/kg/day) was metabolized, compared with only 5% of a high dose (2000 mg/kg/day). In humans, less than 2% of the retained amount of Perchloroethylene was metabolized and excreted in the urine within 67 hours following a 3-hour exposure to 87 ppm (600 mg/m<sup>3</sup>). A mean half-life of about 144 hours for the elimination of urinary metabolites following inhalation exposure has been calculated in humans. The metabolites of Perchloroethylene are excreted in the urine (approx. 8% of an inhaled dose), with very low percentages of the absorbed amount exhaled as carbon dioxide (1%) or eliminated in the feces (2%). The half-life of elimination of Perchloroethylene in humans is estimated to be 6-10 days. Based on the findings of the various studies, there is no bioaccumulation potential for Perchloroethylene.

**METABOLISM:** Available information suggests that cytochrome P450-dependent oxidation is likely the dominant metabolic pathway for Perchloroethylene (PCE) in rodents and humans, with the glutathione conjugation pathway contributing to PCE metabolism at a much lower extent. Metabolic flux through the oxidative pathway was ~30-fold higher than through the conjugation pathway in male mice of three different strains following single oral doses of 1,000 mg/kg PCE. The primary oxidative metabolite of PCE is trichloroacetic acid (TCA), which is thought to be formed from spontaneous decomposition of trichloroacetyl chloride (TCAC). Dechlorination of TCA could yield dichloroacetic acid (DCA); however, most of the DCA excreted after exposure to PCE is believed to be produced in the kidney as an end product of  $\beta$ -lyase metabolism.

**BIOLOGICAL DISTRIBUTION:** See Toxicokinetics above.

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

**ENDOCRINE DISRUPTOR:** Perchloroethylene 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.

**NEUROTOXICITY:** Perchloroethylene is considered a neurotoxic substance, meaning it can cause damage to the nervous system, primarily affecting cognitive function, memory, and visual perception, with potential impacts on reaction time and color discrimination due to chronic exposure through inhalation. Breathing this material may cause central nervous system depression with symptoms including nausea, headache, dizziness, fatigue, drowsiness, or unconsciousness.

**IMMUNOTOXICITY:** Animal studies have evaluated the association between Perchloroethylene (PCE) exposure and autoimmunity, hypersensitivity, immunosuppression and general immune measures and have identified associations with PCE for each type of measure in some (but not all) studies.

## Health Hazards of Significance Not Mentioned in GHS Classification

- Potential endocrine disruptor
  - The transfer of tetrachloroethylene in milk was reported in laboratory animals and women
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## SECTION 12. ECOLOGICAL INFORMATION

### ECOTOXICITY (EC, IC, and LC):

#### Aquatic Toxicity:

Chlamydomonas reinhardtii 72 hr EC50 = 3.64 mg/l  
Chlamydomonas reinhardtii EC50-3.64 mg/l

#### Fish Toxicity:

Salmo gairdneria 96 hr LC50 = 5 mg/l  
Jordanella floridae 96 hr LC50 = 8.4 mg/l  
Pimephales promelas 96 hr LC50 = 18.4 -21.4 mg/l  
Jordanella floridae 10 day NOEC = 1.99 mg/l; LOEC = 4.85 mg/l (larvae)  
Jordanella floridae 28 day NOEC = 2.34 mg/l; LOEC = 5.82 mg/l (fry)

#### Invertebrate Toxicity:

LC50 (Static) Mysid shrimp (96 hr.) = 10.2 ppm  
LC50 Daphnia magna (48 hr.) = 18 mg/L  
Daphnia magna 48 hr EC50 = 8.5 mg/l  
Daphnia magna 28 d NOEC = 0.51 mg/l; LOEC = 1.1 mg/l

### FATE AND TRANSPORT:

**PERSISTENCE:** AIR: In the environment, PCE is expected to largely volatilize to the atmosphere where it may undergo long-range transport and slowly degrade via indirect photolysis, with a half-life  $\leq 6$  months. SOIL: PCE has low potential to partition to or accumulate in soil and is primarily expected to volatilize to air or migrate through soil into groundwater based on its physical-chemical properties. WATER: Based on its Henry's Law constant (0.0177 atm-m<sup>3</sup>/mole) and vapor pressure (18.5 mmHg at 25°C), PCE can be expected to volatilize from surface water to air and from soil to air. Predicted volatilization from surface water to be 1.4 hours for rivers and 123 hours for lakes.

**BIODEGRADATION:** Biodegradation may occur under anaerobic conditions (in the absence of oxygen).

**BIOCONCENTRATION:** Bioconcentration potential is low to moderate with a BCF of 26-77.

**BIOACCUMULATIVE POTENTIAL:** With measured bioconcentration factors of 312 or lower and estimated bioaccumulation factor of 46, perchloroethylene has limited bioaccumulation potential.

**MOBILITY IN SOIL:** Average Koc of 237 suggests moderate mobility in soil. This material can leach rapidly through sandy soil to reach groundwater. Soil adsorption potential is low. Will not significantly hydrolyze in soil or water under normal environmental conditions.

**ADDITIONAL ECOLOGICAL INFORMATION:** Perchloroethylene has a negligible tropospheric ozone creation potential in the atmosphere.

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

**Assessment:** Taking into consideration PBT criteria detailed in Annex XIII of REACH and by registrant submitted information, Perchloroethylene meets criteria for persistence (P and vP), but does not meet the criteria for bioaccumulation (B or vB) and toxicity (T). Overall, Perchloroethylene (PCE) may be persistent or very persistent

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in the environment. It has moderate potential to accumulate in wastewater biosolids, soil, and sediment, and has low potential to bioaccumulate. In the environment, PCE is expected to largely volatilize to the atmosphere where it may undergo long-range transport and slowly degrade via indirect photolysis. Not B and not vB based on: BCF  $\leq$  2,000 L/kg (the highest observed BCF in fish was 49 l/kg, based on whole body w.wt. in of a flow-through exposure study). Not T based on: EC10 or NOEC  $\geq$  0.01 mg/L for marine / freshwater organisms (long-term toxicity) Toxicity assessment: The acute effect concentrations for all three trophic levels are much higher than the screening criterion of 0.1 mg/l. It can therefore be expected that Perchloroethylene is not potentially toxic towards aquatic organisms. The chronic effect concentrations for invertebrates and algae were higher than the defined criterion of 0.01 mg/l.

## SECTION 13. DISPOSAL CONSIDERATIONS

### **Waste from material:**

Reuse or reprocess, if possible. Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber. Keep out of water supplies, sewers, and soil. Recovered liquids may be sent to a licensed reclaimer or incineration facility. Wastewater from contaminant suppression, cleaning of protective clothing/equipment, or contaminated sites should be contained and evaluated for subject chemical or decomposition product concentrations. Concentrations shall be lower than applicable environmental discharge or disposal criteria. Alternatively, pretreatment and/or discharge to a permitted wastewater treatment facility is acceptable only after review by the governing authority and assurance that "pass through" violations will not occur. Due consideration shall be given to remediation worker exposure (inhalation, dermal and ingestion) as well as fate during treatment, transfer, and disposal. If it is not practicable to manage the chemical in this fashion, it must be evaluated in accordance with United States Environmental Protection Agency (US EPA) 40 CFR Part 261, specifically Subpart B, in order to determine the appropriate local, state, and federal requirements for disposal.

### **Container Management:**

Dispose of container in accordance with applicable local, regional, national, and/or international regulations. Container rinsate must be disposed of in compliance with applicable regulations.

### **Contaminated Material:**

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:** UN1897

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**PROPER SHIPPING NAME:** Tetrachloroethylene  
**HAZARD CLASS/ DIVISION:** 6.1  
**PACKING GROUP:** III  
**LABELING REQUIREMENTS:** 6.1  
**MARINE POLLUTANT:** Tetrachloroethylene

**RQ (Lbs.):** RQ 100 Lbs. (Tetrachloroethylene)  
 RQ 10 Lbs. (Carbon tetrachloride)

**CANADIAN TRANSPORTATION OF DANGEROUS GOODS:**

**UN NUMBER:** UN1897  
**SHIPPING NAME:** Tetrachloroethylene  
**CLASS OR DIVISION:** 6.1  
**PACKING/RISK GROUP:** III  
**LABELING REQUIREMENTS:** 6.1  
**CAN. MARINE POLLUTANT:** Tetrachloroethylene

**MARITIME TRANSPORT (IMO / IMDG)**

**UN NUMBER:** UN1897  
**PROPER SHIPPING NAME:** Tetrachloroethylene  
**HAZARD CLASS / DIVISION:** 6.1  
**Packing Group:** III  
**MARINE POLLUTANT:** Tetrachloroethylene

**AIR TRANSPORT (ICAO / IATA)**

**Special Instructions CAO:** IATA Certificate for shipping personnel is required

## 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)
Tetrachloroethylene [Perc] 127-18-4 (99.0 - 100.0 %)	100 lbs(RQ)	100 lb	Not listed	Not Listed

**SARA EHS Chemical (40 CFR 355.30)**

Not regulated.

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**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 - Specific Target Organ Toxicity (STOT) Repeat Exposure (RE)  
 Health Hazard - Aspiration Hazard  
 Health 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
Tetrachloroethylene [Perc] 127-18-4 (99.0 - 100.0)	0.1% (de minimis concentration)	Not Listed

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

No components in this material are 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.

Component	Clean Water Act - Priority Pollutants	CAA - ODS CLASS 1 AND CLASS 2	CAA - Volatile Organic Compounds (VOCs) in SOCM1	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
Tetrachloroethylene [Perc] 127-18-4 (99.0 - 100.0 %)	Present	Not Listed	Present	Present	Present	Present	Not Listed	Not Listed
Tripropylene 27215-95-8 (<0.08 %)	Not Listed	Not Listed	Present	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
Diallylamine 124-02-7 (<0.02 %)	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
Carbon Tetrachloride 56-23-5 (<0.005 %)	Present	Class I ODS	Present	Present	Present	Not Listed	Not Listed	Not Listed
Phenol, 4-(1,1-dimethylpropyl)- 80-46-6 (<0.001 %)	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed

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

Component	TSCA Inventory	TSCA ACTIVE	TSCA 12(b)	TSCA/Section 4	TSCA/Section 5	TSCA/Section 6	TSCA/Section 8

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		LIST					
Tetrachloroethylene [Perc] 127-18-4 (99.0 - 100.0 %)	Listed	ACTIVE R	Not Listed	Not listed	Not Listed	Chemicals subject to Risk Evaluation	Listed
Tripropylene 27215-95-8 (<0.08 %)	Listed	ACTIVE	Not Listed	Not listed	Not Listed	Not Listed	Not listed
Diallylamine 124-02-7 (<0.02 %)	Listed	ACTIVE	Not Listed	Not listed	Not Listed	Not Listed	Not listed
Carbon Tetrachloride 56-23-5 (<0.005 %)	Listed	ACTIVE R	Not Listed	Not listed	Not Listed	Chemicals subject to Risk Evaluation	Not listed
Phenol, 4-(1,1-dimethylpropyl)- 80-46-6 (<0.001 %)	Listed	ACTIVE	Not Listed	Not listed	Not Listed	Not Listed	Listed

### Toxic Substance Control Act (TSCA) Restriction of Use:

- EPA 40 CFR Part 63 National Perchloroethylene Air Emission Standards for Dry Cleaning Facilities restricts/bans the use of Perchloroethylene in dry cleaning operations
- After December 8, 2026 this chemical substance (as defined in TSCA section 3(2))/ product cannot be distributed in commerce to retailers for any use. After March 8, 2027, this chemical substance (as defined in TSCA section 3(2))/product is and can only be distributed in commerce or processed with a concentration of PCE (Perchloroethylene) equal to or greater than 0.1% by weight for the following purposes: (1) Processing as a reactant/intermediate; (2) Processing into formulation, mixture or reaction product; (3) Processing by repackaging; (4) Recycling; (5) Industrial and commercial use as solvent in open-top batch vapor degreasing; (6) Industrial and commercial use as solvent in closed-loop batch vapor degreasing; (7) Industrial and commercial use in maskant for chemical milling; (8) Industrial and commercial use as a processing aid in catalyst regeneration in petrochemical manufacturing; (9) Industrial and commercial use as a processing aid in sectors other than petrochemical manufacturing; (10) Industrial and commercial use as solvent for cold cleaning of tanker vessels; (11) Industrial and commercial use as energized electrical cleaner; (12) Industrial and commercial use in laboratory chemicals; (13) Industrial and commercial use in solvent-based adhesives and sealants; (14) Industrial and commercial use in dry cleaning in 3rd generation machines until December 20, 2027; (15) Industrial and commercial use in all dry cleaning and related spot cleaning until December 19, 2034; (16) Export; and (17) Disposal.

### TSCA 12(b):

- Section 12(b) of the Toxic Substances Control Act (TSCA) requires any person who exports or intends to export a chemical substance or mixture that is regulated under TSCA sections 4, 5, 6 and/or 7 to notify EPA of such export or intent to export. This requirement is described in more detail in the Code of Federal Regulations (CFR) at 40 CFR part 707, subpart D
- Perchloroethylene is subject to TSCA 12(b) annual reporting requirements (per country)  
De minimis reporting level: 0.1%  
TSCA Section(s): 6(a)

**Canadian Chemical Inventory:** All components of this product are listed on either the DSL or the NDSL.

Component	DSL	NDSL
Tetrachloroethylene [Perc] 127-18-4 (99.0 - 100.0)	Listed	Not Listed
Tripropylene 27215-95-8 (<0.08)	Listed	Not Listed
Diallylamine 124-02-7 (<0.02)	Listed	Not Listed
Carbon Tetrachloride 56-23-5 (<0.005)	Listed	Not Listed

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Phenol, 4-(1,1-dimethylpropyl)- 80-46-6 (<0.001)	Listed	Not Listed
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## 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 as listed under Proposition 65 State Drinking Water and Toxic Enforcement Act.

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
Tetrachloroethylene [Perc] 127-18-4 (99.0 - 100.0 %)	Listed	Not listed	Not Listed	Not Listed	Listed	Listed
Tripropylene 27215-95-8 (<0.08 %)	Not listed	Not listed	Not Listed	Not Listed	Listed	Not Listed
Diallylamine 124-02-7 (<0.02 %)	Not listed	Not listed	Not Listed	Not Listed	Not Listed	Not Listed
Carbon Tetrachloride 56-23-5 (<0.005 %)	Listed	Not listed	Not Listed	Not Listed	Listed	Listed
Phenol, 4-(1,1-dimethylpropyl)- 80-46-6 (<0.001 %)	Not listed	Not listed	Not Listed	Not Listed	Listed	Not Listed

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
Tetrachloroethylene [Perc] 127-18-4 (99.0 - 100.0 %)	1810	carcinogen	Listed	Listed	Present	Present
Tripropylene 27215-95-8 (<0.08 %)	Not Listed	Not Listed	Not Listed	Listed	Not Listed	Not Listed
Diallylamine 124-02-7 (<0.02 %)	0609	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
Carbon Tetrachloride 56-23-5 (<0.005 %)	0347	carcinogen	Listed	Listed	Present	Present
Phenol, 4-(1,1-dimethylpropyl)- 80-46-6 (<0.001 %)	Not Listed	Not Listed	Not Listed	Listed	Not Listed	Not Listed

## 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
Tetrachloroethylene [Perc] 127-18-4 (99.0 - 100.0 %)	Present (044) Present (065)	Part 1, Group A Substance (165)	Not Listed	Listed	Not Listed
Tripropylene 27215-95-8 (<0.08 %)	Present (065)	Not Listed	Not Listed	Listed	Not Listed
Diallylamine 124-02-7 (<0.02 %)	Not listed	Not Listed	Not Listed	Listed	Not Listed
Carbon Tetrachloride 56-23-5 (<0.005 %)	Present (018) Present (065)	Part 1, Group A Substance (037)	Not Listed	Listed	Not Listed
Phenol, 4-(1,1-dimethylpropyl)- 80-46-6 (<0.001 %)	Schedule 1, Part 3 Substance	Not Listed	Not Listed	Listed	Not Listed

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## SECTION 16. OTHER INFORMATION

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**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 Perchloroethylene Risk Management Rule: United States EPA requirements as noted in 40CFR CHAPTER I SUBCHAPTER R PART 751 SUBPART G (<https://www.ecfr.gov/current/title-40/chapter-I/subchapter-R/part-751/subpart-G>)
- 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)
- 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)

**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.

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.

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**End of Safety Data Sheet**

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