

SAFETY DATA SHEET



CHLOROFORM (ALL GRADES)

North America EN
SDS No.: M47011

Rev. Date: 03-Dec-2025
Rev. Num. 13

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:	CHLOROFORM; CHLOROFORM TECHNICAL GRADE; CHLOROFORM FLUOROCARBON GRADE; CHLOROFORM ALCOHOL STABILIZED GRADE
Trade Name:	Chloroform; Chloroform Technical Grade; Chloroform Fluorocarbon Grade; Chloroform Alcohol Stabilized Grade
Synonyms:	METHYL TRICHLORIDE; FORMYL TRICHLORIDE; METHANE TRICHLORIDE; METHENYL TRICHLORIDE; TRICHLOROFORM; TRICHLOROMETHANE
Product Use:	<ul style="list-style-type: none">- Technical Grade is used as a chemical intermediate in the preparation of dyes, plastics, resins and pesticides. It can also be involved as an industrial solvent in photography and as a heat transfer medium in fire extinguishers;- Fluorocarbon Grade is primarily used as a precursor for HCFC-22, which serves as a key ingredient in producing PTFE fluoropolymer;- Alcohol Stabilized Grade is primarily used as a solvent in pharmaceutical extraction and purification processes, with additional applications in purifying antibiotics, alkaloids, vitamins, and as a laboratory reagent for preparing various fine chemicals
Restrictions on Use (United States):	Chloroform may NOT be used as an ingredient in cosmetic products or food packaging. In addition, all drug products containing chloroform have been

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removed from the market, and a new drug application is required for approval. For cosmetic products, the regulation makes an exception for residual amounts, in certain cases, from its use as a processing solvent during manufacture, or as a byproduct from the synthesis of an ingredient (21 CFR 700.18).

Restrictions on Use (EU): FOR INDUSTRIAL USE ONLY. Chloroform use is restricted in the EU and shall not be placed on the market, or used, as substances or as constituents of other substances, or in mixtures in concentrations equal to or greater than 0,1 % by weight, where the substance or mixture is intended for supply to the general public and/or is intended for diffusive applications such as in surface cleaning and cleaning of fabric.

Other Global Restrictions on Use: FOR USE IN INDUSTRIAL INSTALLATIONS ONLY. 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: Halogenated Organic Chemicals

Note: The Alcohol Stabilized Grade contains small amounts of ethanol as a stabilizer. The Technical and Fluorocarbon Grades do not.

Additional Information: The manufacturing process for Alcohol Stabilized Chloroform does not incorporate all of the measures specified in the U.S. Food and Drug Administration's current Good Manufacturing Practices (cGMP). It is the responsibility of the user to assess their use of Alcohol Stabilized Chloroform products in food, feed, or pharmaceutical related applications and to determine whether appropriate regulatory requirements are being met.

SECTION 2. HAZARDS IDENTIFICATION

OSHA REGULATORY STATUS: Health hazard classifications were performed using OSHA Hazard Communication 2024 (1910.1200) Appendix A and/or UN GHS Rev. 8 (2019). 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).

EMERGENCY OVERVIEW:

Color:	Colorless
Physical State:	Liquid
Appearance:	Clear liquid
Odor:	Mildly sweet odor, Pleasant, etheric

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Signal Word: **DANGER**

MAJOR HEALTH HAZARDS: HARMFUL IF SWALLOWED. MAY BE HARMFUL IF SWALLOWED AND ENTERS AIRWAYS. CAUSES SKIN IRRITATION. CAUSES SERIOUS EYE IRRITATION. HARMFUL IF INHALED. MAY CAUSE DROWSINESS OR DIZZINESS. SUSPECTED OF CAUSING CANCER. SUSPECTED OF DAMAGING FERTILITY OR THE UNBORN CHILD. CAUSES DAMAGE TO LIVER, KIDNEYS, AND HEART. CAUSES DAMAGE TO LIVER THROUGH PROLONGED OR REPEATED EXPOSURE. MAY CAUSE DAMAGE TO KIDNEYS THROUGH PROLONGED OR REPEATED EXPOSURE. THIS MATERIAL IS A POTENTIAL ENDOCRINE DISRUPTOR.

AQUATIC TOXICITY: HARMFUL TO AQUATIC LIFE. TOXIC TO AQUATIC LIFE WITH LONG LASTING EFFECTS, FOR CHRONIC EXPOSURES.

PRECAUTIONARY STATEMENTS: Obtain, read, and follow all safety instructions before use. Do not breathe mist, vapors, or spray. Wash hands and exposed skin 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. Avoid release to the environment. Wear protective gloves, protective clothing, eye, and face protection.

HAZARD CLASSIFICATION:

GHS: CONTACT HAZARD - SKIN:	Category 2 - Causes skin irritation
GHS: CONTACT HAZARD - EYE:	Category 2 - Causes serious eye irritation
GHS: ACUTE TOXICITY - INHALATION:	Category 4 - Harmful if inhaled
GHS: ACUTE TOXICITY - ORAL:	Category 4 - Harmful if swallowed
ASPIRATION HAZARD:	Category 2 - May be harmful if swallowed and enters airways
SPECIFIC TARGET ORGAN TOXICITY (STOT) - SINGLE EXPOSURE (SE):	- Category 1 - Causes damage to liver, kidney, and heart - Category 3 - May cause drowsiness or dizziness
SPECIFIC TARGET ORGAN TOXICITY (STOT) - REPEAT EXPOSURE (RE):	- Category 1 - Causes damage to liver through prolonged or repeated exposure - Category 2 - May cause damage to kidneys through prolonged or repeated exposure
GHS: CARCINOGENICITY:	Category 2 - Suspected of causing cancer
GHS: REPRODUCTIVE TOXICITY:	Category 2 - Suspected of damaging fertility or the unborn child
HAZARDS NOT OTHERWISE CLASSIFIED (HNO):	- ACUTE AQUATIC HAZARD - CATEGORY 3: Harmful to aquatic life - AQUATIC TOXICITY - ACUTE: Category 2 (Toxic to aquatic life)

UNKNOWN ACUTE TOXICITY:**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:

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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)

- Harmful if swallowed
- May be harmful if swallowed and enters airways
- Causes skin irritation
- Causes serious eye irritation
- Harmful if inhaled
- May cause drowsiness or dizziness
- Suspected of causing cancer
- Suspected of damaging fertility or the unborn child
- Causes damage to liver, kidneys, and heart
- May cause damage to Liver through prolonged or repeated exposure
- May cause damage to kidneys through prolonged or repeated exposure

Additional Hazards - GHS Hazards Not Otherwise Classified (HNOC):

- ACUTE AQUATIC HAZARD - CATEGORY 3: Harmful to aquatic life
- CHRONIC AQUATIC HAZARD - CATEGORY 2: Toxic 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 and exposed skin 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
- Avoid release to the environment
- Wear protective gloves/protective clothing/eye protection/face protection

GHS - Precautionary Statement(s) - Response

- IF SWALLOWED: Get medical help
- IF SWALLOWED: Rinse mouth. Do NOT induce vomiting
- IF INHALED: Remove person to fresh air and keep comfortable for breathing
- IF INHALED: Get medical help
- IF ON SKIN: Wash with plenty of soap and water
- Specific treatment for skin contact (see First Aid Information in 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

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- If eye irritation persists: Get medical help
- IF exposed or concerned: Get emergency medical help immediately
- Specific treatment (see "Notes to Physician" in 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

Health Hazards Not Mentioned in GHS Classification

- Potential endocrine disruptor

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

Chloroform is not PBT / vPvB, as it partitions primarily to the atmosphere with a mean half-life of 70 days and does not accumulate in the environment. While chloroform fulfils the toxicity criterion, it is not considered persistent or bioaccumulative.

Component	U.S. - CERCLA/SARA - Section 313 - PBT Chemical Listing	EU - PBT / vPvB Status
Chloroform	Not listed	Considered not to be an EU PBT
Ethyl Alcohol (Alcohol Stabilized Grade Only)	Not listed	Considered not to be an EU PBT

Endocrine Disruptor Assessment:

Chloroform is a chemical that may interfere with the endocrine system; however, the exact mechanism by which chloroform interferes with the endocrine system is not fully understood.

Component	Endocrine Screening List	EU - REACH (1907/2006) - Article 59(1) - Candidate List of Substances of Very High Concern (SVHC) for Authorisation
Chloroform	TEDX Potential Endocrine List: Present Japan EXTEND List: Not Currently Tested	Not Listed as SVHC
Ethyl Alcohol (Alcohol Stabilized Grade Only)	TEDX Potential Endocrine List: Present	Not Listed as SVHC

See Section 11: TOXICOLOGICAL INFORMATION

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SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Component	Systematic Chemical Name	Common name	CAS Number	Percent [%]
Chloroform 67-66-3	Trichloromethane	Chloroform	67-66-3	> 99
Ethyl Alcohol (Alcohol Stabilized Grade Only) 64-17-5	Ethanol	Ethyl Alcohol	64-17-5	< 1

Notes: *The Alcohol Stabilized Grade contains small amounts of ethanol as a stabilizer. The Technical and Fluorocarbon Grades do not.*

SECTION 4. FIRST AID MEASURES

General Advice: IF exposed or concerned: Get emergency medical help immediately. Specific treatment (see "Notes to Physician" below).

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 or hair, wash with plenty of soap and water. If skin irritation occurs: Get medical help. Take off contaminated clothing and wash it before reuse.

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

INGESTION: IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. IF SWALLOWED: Get medical help.

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

Acute Symptoms/Effects:

Eye: Eye Irritation: Eye exposure may cause irritation, tearing, conjunctivitis, corneal edema, cornea epithelial damage.

Skin: Skin Irritation: Exposure to skin may cause redness, dryness, localized edema, ulcerations. This material may be absorbed across the skin causing systemic effects. Chloroform absorbed through the skin and into the blood is expected to be metabolized and to cause toxicity in much the same way as chloroform absorbed by other exposure routes.

Inhalation (Breathing): Respiratory System Effects: Inhalation of this material may cause acute respiratory depression with central nervous system (CNS) depression, resulting in lightheadedness to possibly rapid loss of consciousness. High concentrations can cause cardiac arrhythmias and cardiac arrest due to sensitization of the myocardium to epinephrine.

Ingestion (Swallowing): Gastrointestinal System Effects: May be fatal if swallowed.

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Chronic (Delayed) Symptoms/Effects: Respiratory System Effects: Chemical pneumonitis and delayed pulmonary edema. Skin: Repeated and prolonged skin contact may cause a chronic dermatitis. May cause delayed hepatotoxicity. Specific treatment: See "Notes to Physicians" below in this Section of the safety data sheet (SDS). Acute renal toxicity has been rarely reported. Suspected of causing cancer. Suspected of damaging fertility or the unborn child.

Target Organ Effects: Heart; Liver; Kidney

Protection of First-Aid Responders: Protect against vapor/gas exposure. Do not breathe gas, fumes, vapor, mist, or spray. Protect against liquid contamination/frostbite. Avoid contact with skin and eyes. Use personal protective equipment (PPE). Refer to Section 8 for specific PPE recommendations.

Notes to Physician: For ingestion, nasogastric aspiration is recommended if volume ingested is of sufficient volume to aspirate. Protect the airway, onset of respiratory depression may be rapid. Consider EKG monitoring to detect cardiac arrhythmias. Monitor blood pressure for hypotension. Avoid catecholamines, especially in the presence of arrhythmias. For very high exposures, (intentional, solvent abuse), oxygen, advanced cardiac life support, intubation and volume support may be required. For skin exposures, wash the area with soap and water, and treat any irritation symptomatically. Thorough decontamination of the eye is important. N-acetylcysteine has been used clinically in patients with chloroform-induced liver dysfunction, based upon the similarity between the mechanism of chloroform and acetaminophen hepatotoxicity. This is based upon 2 case reports, 1 dosed at 600 mg/day, while a second mirrored dosing recommended for acetaminophen toxicity: 150 mg/kg over 1 hour, 50 mg/kg over 4 hours, then an IV infusion of 6.25 mg/kg/h. The clinical efficacy and benefit of N-acetylcysteine for chloroform hepatotoxicity is currently unproven. If chloroform is absorbed through the skin, a medical evaluation should include a thorough physical examination focused on the affected area. Specifically, the clinician should examine for evidence of erythema (redness), dermatitis (skin inflammation), and other lesions that may indicate irritation or injury. If the skin exposure results in symptoms that are more than mild and not resolving—such as persistent irritation, swelling, or the development of skin lesions—medical assessment and observation are recommended. The evaluation may also include monitoring for signs of systemic toxicity, especially if a significant amount of chloroform was absorbed, as skin exposure can occasionally lead to systemic effects. See section 11 for additional toxicology information.

Interaction with Other Chemicals Which Enhance Toxicity: Alcohol may enhance toxic effects. May potentiate other agents that cause central nervous system (CNS) and respiratory system depression, such as alcohol, opiates. Liver toxicity may be enhanced by other agents that cause liver damage, such as alcohol, acetaminophen. Catechol amines may potentiate arrhythmias.

Medical Conditions Aggravated by Exposure: May increase potential for cardiac arrhythmia. Persons with alcoholism, kidney disorders, liver disorders, or central nervous system disorders may be more susceptible to toxicity.

SECTION 5. FIRE FIGHTING MEASURES

Fire Hazard: Negligible fire hazard.

Explosive properties: This product does not contribute to the spreading of flames, nor is it combustible or explosive.

Extinguishing Media: Use media appropriate for surrounding fire.

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Specific Hazards: Non-combustible, substance itself does not burn but may decompose upon heating to produce corrosive and/or toxic fumes.

Unusual Hazards: Containers may explode when heated. Runoff may pollute waterways.

Fire Fighting: Wear NIOSH approved positive-pressure self-contained breathing apparatus operated in pressure demand mode. Move container from the 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. Keep water runoff out of water supplies and sewers (see Section 6 of the SDS).

Component	Immediately Dangerous to Life/ Health (IDLH)
Chloroform 67-66-3	500 ppm IDLH
Ethyl Alcohol (Alcohol Stabilized Grade Only) 64-17-5	3300 ppm IDLH

Hazardous Combustion Products: Thermal decomposition or 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 flammable

Upper Flammability Level (air): Not flammable

Flash point: Not flammable

Auto-ignition Temperature: Not flammable

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal Precautions: Keep unnecessary and unprotected people away. Isolate hazard areas and deny entry. Evacuation of surrounding area may be necessary for large spills. Do not get in eyes, on skin or on clothing. Do not breathe dust, fumes, gas, mist, vapors, or spray. Most vapors are heavier than air and will spread along ground and collect in low or confined areas (drains, basements, tanks). Ventilate closed spaces before entering. 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.

Emergency Procedures: For other than minor leaks, immediately implement the facility's predetermined emergency response plan. Restrict access to the area until cleanup is complete. Prevent material and runoff from entering sewers and waterways if it can be done safely well ahead of the release. Ventilate confined area, if possible, without placing personnel at risk. Cleanup personnel must wear proper protective equipment. Notify all downstream

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water users of possible contamination.

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

Methods and Materials for Containment, Confinement, and/or Abatement: Stop leak, if possible, without personal risk. Shut off ventilation system if needed. Ventilate closed spaces before entering. Completely contain spilled materials with dikes, sandbags, etc. Remove contaminated soil or collect with appropriate absorbent and place into suitable container. Keep container tightly closed. Liquid material may be removed with a properly rated vacuum truck. Dispose of in accordance with all applicable regulations. See Section 13, Disposal considerations, for additional information.

Methods and Materials for Clean-up

Recovery: In case of spill or leak, stop the leak as soon as possible. Shut off ventilation systems to occupied areas where they can be impacted by vapors picked up by the intake systems. Ventilate closed spaces before entering. Liquid material may be removed with a properly rated vacuum truck. Small and large spills: Contain spilled material if possible. After containment, collect the spilled material and transfer to a chemical waste area. Spills must be surrounded by absorbent material in order to delimit its extension, then complete its absorption. The recovered material must be placed in a suitable container and labelled with corresponding identification.

Neutralization: No additional information available.

Final Disposal: For waste disposal, see section 13.

Additional Disaster Prevention Measures: No information available.

SECTION 7. HANDLING AND STORAGE

Handling:

Precautions for Safe Handling:

Review and adhere to requirements in 49 CFR 177.834 for unloading product. Most vapors are heavier than air and will spread along ground and collect in low or confined areas (drains, basements, tanks). Before entering tanks or opening service lines that may have contained chlorinated organics, they should be completely emptied and checked for vapors before performing maintenance activities. Never enter a confined space (which includes tanks or pits) without following proper entry procedures such as 29 CFR 1910.146.

Technical measures/precautions: 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.

Other precautions: Obtain special instructions before use. Do not handle until all safety precautions have been read and understood.

Prevention of contact: Do not breathe mist, vapor, or spray. Wash skin and contaminated clothing thoroughly after handling. Do not eat, drink, or smoke when using this product. Use only outdoors or in a well-ventilated area. Wear

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protective gloves, protective clothing, eye, and face protection.

Storage:

Safe Storage Conditions: Store and handle in accordance with all current regulations and standards. Keep container tightly closed and properly labeled. Store in a cool, dry area. Store in a well-ventilated area. Prevent water or moist air from entering storage tanks or containers. 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. 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 Section 10 of SDS).

Technical measures: 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. Always store chlorinated organic drums in areas equipped with secondary containment systems. Containment systems should be adequate to hold 110% of the largest expected amount of drummed product to be stored, and should be impermeable to chlorinated organics.

Incompatible Materials: bases, reactive metals, metallic fines or powders, oxidizing materials, halogens, acetone, aluminum, disilane, magnesium, potassium, sodium.

Packaging or Materials of Construction: 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. The storage tanks exterior should be cleaned, primed and painted with a white or aluminum colored paint to aid in keeping the tank and its contents cool.

Additional Information:

Keep containers tightly closed in a cool, well-ventilated place.

SECTION 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

REGULATORY EXPOSURE LIMIT(S):

Listed below for the product components that have regulatory occupational exposure limits (OEL's).

Component	OSHA Final PEL TWA	OSHA Final PEL STEL	OSHA Final PEL Ceiling
Chloroform 67-66-3 (> 99 %)	-----	-----	50 ppm { Ceiling} 240 mg/m ³ { Ceiling}
Ethyl Alcohol (Alcohol Stabilized Grade Only) 64-17-5 (< 1 %)	1000 ppm (TWA) 1900 mg/m ³ (TWA)	-----	-----

OEL: Occupational Exposure Limit; OSHA: United States Occupational Safety and Health Administration;

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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
Chloroform 67-66-3 (> 99 %)	Ontario - 10 ppm (TWA) Alberta - 10 ppm (TWA) Alberta - 49 mg/m ³ (TWA) British Columbia - 2 ppm (TWA)	-----	-----
Ethyl Alcohol (Alcohol Stabilized Grade Only) 64-17-5 (< 1 %)	Alberta - 1000 ppm (TWA) Alberta - 1880 mg/m ³ (TWA)	Ontario - 1000 ppm (STEL)	-----

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)
Chloroform 67-66-3 (> 99 %)	10 ppm TWA	-----	-----	-----	2 ppm (STEL) 9.78 mg/m ³ (STEL)	-----	2 ppm (9.78 mg/m ³)	-----	-----
Ethyl Alcohol (Alcohol Stabilized Grade Only) 64-17-5 (< 1 %)	-----	1000 ppm (STEL)	-----	-----	1000 ppm (TWA) 1900 mg/m ³ (TWA)	-----	1000 ppm 1900 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.

Additional Advice: SEE SECTION 11 FOR ADDITIONAL TOXICOLOGICAL INFORMATION.

ENGINEERING CONTROLS: Provide local exhaust or process enclosure ventilation system. Ensure compliance with applicable exposure limits.

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.

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Skin and Body Protection: Wear chemical resistant clothing to prevent skin contact. Thoroughly clean and dry contaminated clothing before reuse. Discard contaminated leather goods.

Hand Protection: Wear appropriate chemical resistant gloves. Consult a glove supplier for assistance in selecting an appropriate chemical resistant glove.

Protective Material Types: Viton®, Polyvinyl alcohol (PVA), Polyethylene (PE).

Respiratory Protection: Where vapor concentration exceeds or is likely to exceed applicable exposure limits, a NIOSH approved respirator is required. A NIOSH approved self-contained positive pressure breathing apparatus with full-face piece or airline respirator is required for spills, emergencies and/or IDLH concentrations. A respiratory protection program that meets 29 CFR 1910.134 must be followed whenever workplace conditions warrant use of a respirator.

Component	Immediately Dangerous to Life/ Health (IDLH)
Chloroform 67-66-3 (> 99 %)	500 ppm IDLH
Ethyl Alcohol (Alcohol Stabilized Grade Only) 64-17-5 (< 1 %)	3300 ppm IDLH

HYGIENE MEASURES: An emergency eyewash fountain and quick drench shower should be provided in the immediate work area.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Clear liquid
Physical State:	Liquid
Color:	Colorless
Odor:	Mildly sweet odor Pleasant, etheric
Odor Threshold [ppm]:	85 ppm (ACGIH 2007) 205-307 ppm (causes olfactory fatigue) Odor Threshold Low: 133.0 [ppm] Odor Threshold High: 276.0 [ppm] Detection odor threshold from AIHA (mean = 192 ppm)
Melting Point/Range:	-63.41°C
Freezing Point/Range:	-83 ° F (-63.9 ° C)
Boiling Point °C	61.12 °C
Evaporation Rate (ether=1):	0.56
Flammability (solid, gas):	Not flammable
Lower Flammability Level (air):	Not flammable
Upper Flammability Level (air):	Not flammable
Explosion limits:	Not applicable
Flash point:	Not flammable
Auto-ignition Temperature:	Not flammable

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Decomposition Temperature:	450 - 700°C
pH:	Not applicable
Viscosity:	5.63 mP (dynamic) @ 20 °C; 5.10 mP (dynamic) @ 30 °C
Dynamic Viscosity:	~ 0.536 mPa.-s
Kinematic Viscosity:	~ 3.62 X 10 ⁻⁷ m ² /s or 0.362 cSt
Water Solubility:	0.8% @ 25 °C
Partition Coefficient (n-octanol/water):	log Kow = 1.97
Vapor Pressure:	160 mmHg @ 20° C 197 mmHg @ 25° C
Density:	12.3313 lbs./gal @ 25°C
Relative Density:	~ 1483 kg/m ³
Relative Density/Specific Gravity (water=1):	1.48 @ 25 ° C
Vapor Density (air=1):	4.1
Particle Size Distribution:	Not applicable to liquids

Other Information

Molecular Formula:	CHCl ₃
Chemical Family:	Halogenated Organic Chemicals
Molecular Weight:	119.38
Explosive properties:	Not applicable
Oxidizing properties:	Not applicable
Bulk Density:	Not applicable for liquids
Crystallization Temperature:	Same as freezing point / melting point
Volatility:	100%
Surface Tension:	27.1 dynes/cm = 0.0271 N/m at 20 °C
Hygroscopic:	Not applicable
Radioactivity:	Not applicable

SECTION 10. STABILITY AND REACTIVITY

Chemical Stability: Stable at normal temperatures and pressures.

Reactivity: Not reactive under normal temperatures and pressures.

Possibility of Hazardous Reactions: Keep away from heat. Containers may rupture or explode if exposed to heat. Will attack some forms of plastics, rubber, and coatings. 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): None known.

Incompatible Materials: bases, reactive metals, metallic fines or powders, oxidizing materials, halogens, acetone, aluminum, disilane, magnesium, potassium, sodium.

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

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Hazardous Polymerization: Will not occur.

SECTION 11. TOXICOLOGICAL INFORMATION

POTENTIAL HEALTH EFFECTS:

TOXICITY:

Chloroform was used as an anesthetic for humans (10,000 - 22,500 ppm), but is no longer recommended for this use due to liver and kidney damage. Intentional abuse can result in significant toxicity. Respiratory depression, with central nervous system depression and delayed hepatotoxicity are indicative of chloroform poisoning. Symptoms of central nervous system depression have been reported in workers at concentrations of 80-240 ppm. Dizziness, vertigo, fatigue, and headache have been reported from exposure to 920 ppm for approximately 3 minutes. Exposure to levels of 1500-2000 ppm have been reported to cause slight anesthesia. Irregular heartbeat may occur from exposure to levels of 8000 ppm or higher. This material is likely to be fatal after 5-10 minutes of 25,000 ppm.

ACUTE TOXICITY:

Eye contact: Eye contact may cause irritation, conjunctivitis, tearing, swelling, eye pain, corneal edema, blurred vision, cornea epithelial damage.

Skin contact: Skin contact may cause irritation, redness, dryness, localized edema, ulcerations after significant long-term exposure.

Inhalation: Not a pulmonary irritant. May cause respiratory depression. May cause slightly sweet odor on breath. May cause central nervous system (CNS) depression resulting in lightheadedness to rapid loss of consciousness. Moderate to severe exposures may cause cardiac arrhythmias.

Ingestion: May cause gastrointestinal effects, liver damage, kidney damage, unconsciousness and death.

CHRONIC TOXICITY:

Chronic Effects: Increased irritability and decreased concentration was reported in female workers exposed to levels of 77 ppm or greater in the workplace. Deliberate abuse has been associated with depression, hallucinations, delirium and degenerative changes in central and peripheral nervous system tissues. May be excreted in breast milk. Repeated exposure has been associated with liver and kidney damage in animals. In addition, nasal cavity changes were observed in rats and mice exposed for 7 days. Long-term ingestion may cause liver damage, reproductive effects and cancer. Interstitial pneumonitis was observed in male rats and in rabbits exposed to this material for six months. This effect was not observed in other species.

SIGNS AND SYMPTOMS OF EXPOSURE:

Inhalation (Breathing): Respiratory System Effects: Inhalation of this material may cause acute respiratory depression with central nervous system (CNS) depression, resulting in lightheadedness to possibly rapid loss of consciousness. High concentrations can cause cardiac arrhythmias and cardiac arrest due to sensitization of the myocardium to epinephrine.

Skin: Skin Irritation: Exposure to skin may cause redness, dryness, localized edema, ulcerations. This material may be absorbed across the skin causing systemic effects. Chloroform absorbed through the skin and into the blood is expected to be metabolized and to cause toxicity in much the same way as chloroform absorbed by other exposure routes.

Eye: Eye Irritation: Eye exposure may cause irritation, tearing, conjunctivitis, corneal edema, cornea epithelial

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damage.

Ingestion (Swallowing): Gastrointestinal System Effects: May be fatal if swallowed.

Interaction with Other Chemicals Which Enhance Toxicity: Alcohol may enhance toxic effects. May potentiate other agents that cause central nervous system (CNS) and respiratory system depression, such as alcohol, opiates. Liver toxicity may be enhanced by other agents that cause liver damage, such as alcohol, acetaminophen. Catechol amines may potentiate arrhythmias.

GHS HEALTH HAZARDS:

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

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

GHS: ACUTE TOXICITY - ORAL: Category 4 - Harmful if swallowed

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

SPECIFIC TARGET ORGAN TOXICITY (STOT) - SINGLE EXPOSURE (SE):

Category 1 - Causes damage to liver, kidney, and heart

Category 3 - May cause drowsiness or dizziness

SPECIFIC TARGET ORGAN TOXICITY (STOT) - REPEAT EXPOSURE (RE):

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

Category 2 - Causes damage to Kidney through prolonged or repeated exposure

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

GHS: CARCINOGENICITY: Category 2 - Suspected of causing cancer

GHS: REPRODUCTIVE TOXICITY: Category 2 - Suspected of damaging fertility or the unborn child

TOXICITY DATA:**PRODUCT TOXICITY DATA:**

LD50 Oral: 300-695 mg/kg oral-rat LD50	LD50 Dermal: > 20 gm/kg skin-rabbit LD50	LC50 Inhalation: 9771 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
Chloroform 67-66-3	908 – 1117 mg/kg (Rat)	>20 g/kg (Rabbit)	10.5 mg/L (Rat) 4-hour
Ethyl Alcohol (Alcohol Stabilized Grade Only) 64-17-5	7060 mg/kg (Rat)	No data available	116.9 – 133.8 mg/L (Rat) 4-hour

EYE IRRITATION/CORROSION: This product is classified as causing serious eye irritation (Category 2) per GHS criteria.

SKIN IRRITATION/CORROSION: The product is classified as cutaneous irritant (Category 2), according to GHS classification criteria.

SKIN ABSORBENT/DERMAL ROUTE: Yes.

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Research on the dermal absorption of chloroform has focused on how quickly it diffuses through the skin and the extent of systemic uptake. Studies in humans have estimated the dermal permeability coefficient (KP) for chloroform, with values ranging from 0.015 to 0.166 cm/hour depending on exposure method and experimental conditions. Measurements using excised human skin and live subjects show variation, likely due to differing methodologies. In swimming pool environments, dermal exposure contributed up to about 24% of total chloroform body burden in scuba divers, and increased physical activity appeared to raise absorption rates in swimmers. Animal studies, particularly in hairless rats and mice, demonstrated rapid absorption of chloroform through the skin, with blood concentrations rising within minutes of exposure. The rate of absorption can be influenced by species, skin type, and exposure duration, while chloroform is quickly eliminated from the skin surface after exposure ends. Overall, these findings highlight the significance of dermal exposure as a route for chloroform uptake in both humans and animals. [ATDSR Oct 2024].

RESPIRATORY OR SKIN SENSITIZATION: Not classified as a skin or respiratory sensitizer per GHS and/or CLP criteria.

CARCINOGENICITY: Classified as Category 2 under GHS (suspected of causing cancer).

- Human studies investigating the cancer risk from chloroform exposure have yielded inconsistent and inconclusive results, often due to confounding factors and limited sample sizes. While some epidemiological research has suggested possible links between chloroform (especially in drinking water) and certain cancers, meta-analyses and many individual studies have failed to confirm these associations. Occupational exposure studies generally do not show a clear connection between chloroform and most cancer types, with rare exceptions based on limited data. Overall, regulatory bodies classify chloroform as possibly carcinogenic to humans, relying primarily on strong evidence from animal studies rather than definitive human data.

- Animal studies have demonstrated that high levels of chloroform exposure can cause liver and kidney tumors in rodents, mainly through inhalation or oral routes. Male mice and rats exposed to elevated concentrations showed increased incidences of renal and liver cancers, while female mice and other species did not consistently exhibit similar effects. Some research indicates chloroform acts as a tumour promoter or initiator, particularly following prior exposure to other carcinogens. The consensus is that chloroform's carcinogenicity in animals' results from chronic tissue damage and regenerative cell proliferation, supporting its classification as possibly carcinogenic to humans.

- The potential bladder effects of chloroform exposure mainly concern a possible increased risk of bladder cancer, but current evidence is not definitive and is confounded by other factors. Most regulatory assessments are based on animal data showing liver and kidney tumors, with less clear evidence for effects on the bladder.

Component	NTP:	IARC (GROUP 1):	IARC (GROUP 2):	OSHA:	ACGIH (American Conference of Governmental Industrial Hygienists)	NIOSH - Pocket Guide - Carcinogens
Chloroform	Reasonably Anticipated - Reasonably Anticipated to be a Human Carcinogen	Not listed	Group 2B - Possibly Carcinogenic to Humans	Listed	A3 - Confirmed Animal Carcinogen with Unknown Relevance to Humans	Potential occupational carcinogen
Ethyl Alcohol (Alcohol Stabilized Grade Only)	Not listed	Not listed	Not listed	Not Listed	A3 - Confirmed Animal Carcinogen with Unknown Relevance to Humans	Not listed

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SPECIFIC TARGET ORGAN TOXICITY (Single Exposure): Chloroform is a highly cytotoxic compound that rapidly enters cells due to its lipid solubility, causing significant tissue and organ damage. In humans, acute exposure primarily affects the central nervous system (CNS) and heart, leading to CNS depression, cardiac arrhythmias, and potentially cardiac arrest. The liver and kidneys are especially vulnerable, with necrosis observed in both organs; a fatal oral dose may be as little as 10 ml. Post-mortem findings in fatal cases reveal fatty degeneration in the liver, kidneys, and heart. Animal studies confirm similar toxic effects, including severe liver and kidney damage, respiratory issues, and high mortality at elevated exposure levels. Acute chloroform exposure can also cause neurological symptoms like dizziness and impaired coordination, with the severity of effects increasing alongside exposure dose and duration. Category 1 - Causes damage to liver, kidney, and heart. Category 3 - Narcotic Effects.

SPECIFIC TARGET ORGAN TOXICITY (Repeated or Prolonged Exposure):

- Chloroform is highly toxic to the liver in both humans and animals, with exposure—whether acute or chronic—leading to a range of liver injuries from mild, reversible changes to severe, sometimes fatal liver failure. Animal studies confirm that liver damage is dose- and duration-dependent, with mice generally more sensitive than rats, and more severe effects seen with higher or repeated exposures. The underlying cause involves metabolic activation, glutathione depletion, oxidative stress, and binding of toxic metabolites, with the severity of harm increasing alongside exposure levels and duration. Chloroform is classified as Category 1 for STOT Repeat Exposure to the Liver.

- Animal studies show that chloroform exposure consistently causes significant, dose-related kidney toxicity, with male rodents—particularly mice and rats—being most susceptible, especially in the proximal convoluted tubule. Both acute and chronic exposures, including inhalation and oral dosing, result in a range of kidney injuries, while other mammals like dogs and rabbits display similar toxic effects. In humans, kidney damage from chloroform is mainly documented in case reports involving high-level exposure, which can lead to tubular degeneration and abnormal urinalysis, but most reversible after cessation of exposure. However, evidence for chronic, low-level kidney toxicity in humans is limited and much weaker than that observed in animal studies. Chloroform is classified as Category 2 for STOT Repeat Exposure to the Kidney.

INHALATION HAZARD: Animal studies show that acute inhalation exposures to chloroform result in deaths at lower concentrations than those used for human anesthesia, likely due to longer exposure durations in animals. Mice are generally more sensitive to chloroform toxicity than rats, especially adult male mice. For rats, a 4-hour LC50 was determined at 9,770.6 ppm, and exposures of 8,000 ppm for 4 hours resulted in most rats dying. In mice, a 50% lethal time (LT50) of 560 minutes was found at 4,500 ppm. Adult male mice were more susceptible than young males, with all adults dying after 1-hour exposures to 983 ppm, while young males survived higher concentrations. However, both groups died after longer exposures at lower concentrations. Renal toxicity was linked to the deaths in male mice, while female mice exposed similarly did not die. (ATSDR Oct 2024). This product is classified as HARMFUL IF INHALED (Category 4) per GHS criteria.

INGESTION HAZARD: Chloroform exhibits moderate acute oral toxicity in rodents. In studies following OECD Guideline No. 401, mean LD50 values in Sprague-Dawley rats were 908 mg/kg for males and 1,117 mg/kg for females, placing it in GHS Toxicity Category 4 with the hazard statement "harmful if swallowed". Across various studies, LD50 values in adult rats ranged from 908 to 2,180 mg/kg and in adult mice from 550 to 1,400 mg/kg, with neonatal rats showing greater sensitivity. Higher mortality was observed at increased doses and in pregnant animals, indicating heightened susceptibility in certain groups.

GERM CELL/IN-VITRO MUTAGENICITY: The majority of the available data indicates that chloroform has a low genotoxic potential. A few studies indicate that chloroform may be a weak mutagen and DNA damaging agent at relatively high concentrations. Additionally, there is limited evidence that chloroform may cause clastogenic and epigenetic changes in mammalian cells. Chloroform exhibits mostly negative results for mutagenicity in Salmonella typhimurium (Ames) assays, both with and without metabolic activation, though some studies report weak or strain-specific mutagenic effects. Similar predominantly negative findings are reported in Escherichia coli and

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Saccharomyces cerevisiae, with isolated instances of weak or conditional mutagenicity. In vivo, chloroform does not induce gene mutations in mouse hepatocytes after inhalation, but some evidence suggests it can cause chromosomal damage or clastogenic effects in mammalian cells, though results are inconsistent across studies and conditions. Non-mammalian organisms show occasional mitotic or chromosomal changes following exposure. DNA damage from chloroform exposure is generally weak and observed only at high concentrations in certain mammalian cell types. Most studies do not find significant DNA damage or unscheduled DNA synthesis in mammalian cells or tissues. Epidemiological data suggest a possible link between blood chloroform levels and increased oxidative DNA damage markers, but animal studies do not consistently support this association. Additionally, chloroform exposure is associated with epigenetic changes, including global decreases in DNA methylation in mouse liver and kidney cells, and hypomethylation of the c-myc protooncogene promoter region, which correlates with increased c-myc expression in the liver and kidney. Overall, chloroform shows limited mutagenic and DNA-damaging potential, with some evidence of epigenetic effects. (ATSDR 2024). Not classified as a mutagen per GHS criteria.

REPRODUCTIVE TOXICITY: Classified as Category 2 under GHS (may cause damage to fertility or the unborn child). Epidemiological studies investigating the relationship between chloroform exposure from tap water and reproductive health outcomes have yielded inconsistent results. Most studies estimated exposure at the community level and did not control for other water chlorination byproducts, which are also linked to adverse reproductive effects. While some associations between chloroform and negative reproductive outcomes have been reported, findings are not consistent across studies. Specifically, some studies observed an increased risk of stillbirth and preterm birth with higher chloroform exposure, but others found no such associations. Chloroform exposure was generally not linked to pregnancy loss, gestational diabetes, hypertension, or changes in menstrual cycle or sex hormone levels. In studies on sperm quality, results varied: some reported decreased sperm count or motility with higher chloroform levels, while others found no significant effect or even improvements in sperm motion parameters. Animal studies show that high levels of chloroform exposure during pregnancy can negatively impact outcomes such as increased fetal resorptions and decreased viable pregnancies, often at doses causing maternal toxicity. However, lower exposure levels typically did not affect reproductive organ histology or function in rodents and dogs. Proposed mechanisms for reproductive toxicity include hormonal disruptions during pregnancy and oxidative damage affecting sperm mitochondrial DNA telomere length. Changes in prostate-specific antigen (PSA) levels, which may impact sperm fertility, have also been observed in association with chloroform exposure. Overall, the evidence for reproductive and developmental toxicity from chloroform exposure is limited and inconsistent, with stronger effects seen at higher exposures commonly associated with maternal toxicity. (ATSDR Oct. 2024).

DEVELOPMENTAL TOXICITY: Category 2 - Suspected of damaging fertility or the unborn child. This material crosses the placenta rapidly and enters fetal circulation. There is limited and inconsistent evidence from epidemiological studies regarding developmental effects of chloroform exposure. Animal studies show some evidence of birth defects, delayed bone development, and impaired growth, but typically only at exposure levels causing maternal toxicity. Systematic reviews suggest that developmental toxicity in humans is not well established, while animal studies provide moderate support for such effects primarily at doses harmful to the mother. Notably, one study found no link between ambient outdoor chloroform levels and spina bifida in Texas pregnancies, and no other relevant human studies were identified. (ATSDR Oct. 2024).

ASPIRATION HAZARD: Chloroform may present an aspiration hazard, as suggested by its calculated kinematic viscosity at 40°C of 0.28 mm²/s and its classification as a chlorinated hydrocarbon; however, specific human data confirming chloroform as an aspiration hazard have not been identified in the literature. Therefore, Chloroform is classified as a Category 2 aspiration toxicity hazard. Category 2 are those chemicals which cause concern owing to the presumption that they cause human aspiration toxicity hazard.

TOXICOKINETICS: The toxicokinetics of chloroform (CAS # 67-66-3, CHCl₃) was systematically evaluated and interpreted in various species including B6C3F1 mice, Fischer 344 and male Osborne-Mendel rats, and male Syrian Golden hamsters for development and validation of a physiologically-based pharmacokinetic (PB-PK) model of

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prospective dose-, species- and route-specific disposition of CHCl₃. This model assumes total chloroform metabolism within target organs, liver and kidney, solely by a mixed function oxidase (MFO) metabolic pathway following Michaelis-Menten kinetics.

METABOLISM: A large number of studies support the conclusion that metabolism of chloroform is required for toxicity. Chloroform is absorbed through the lungs, gastrointestinal tract, and skin. It is distributed throughout the body, with the equilibrium distribution being in the following order: fat>>liver>kidney≥ other tissues. Chloroform is metabolized by mixed function oxidases (CYP2E1) in the liver, kidney, and other tissues to form reactive intermediates such as phosgene. Absorbed chloroform is excreted primarily through the lungs as chloroform. Metabolites are excreted primarily through the lungs as carbon dioxide and in urine to a lesser extent.

BIOLOGICAL DISTRIBUTION: See metabolism above.

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

ENDOCRINE DISRUPTOR: Chloroform is a chemical that may interfere with the endocrine system; however, the exact mechanism by which chloroform interferes with the endocrine system is not fully understood. Chloroform 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: It is known that chloroform can cause harm to the central nervous system. Breathing this material may cause central nervous system depression with symptoms including nausea, headache, dizziness, fatigue, drowsiness, or unconsciousness. Long term exposure to concentrations of 20-200 ppm of chloroform produce mainly neurological effects, with increased incidence of symptoms such as fatigue, nausea, vomiting, lassitude, dry mouth, and anorexia.

IMMUNOTOXICITY: Chloroform administered via drinking water affects body weight and selected hematological parameters at high dose levels; however, overall immune responses, as measured in several tests for immune function, are not compromised.

Health Hazards Not Mentioned in GHS Classification

- Potential endocrine disruptor

SECTION 12. ECOLOGICAL INFORMATION**ECOTOXICITY (EC, IC, and LC):****Ecotoxicity - Available LOLI Data for Components:**

Component:	Freshwater Fish:	Invertebrate Toxicity:	Algae Toxicity:	Other Toxicity:
Chloroform 67-66-3 (> 99 %)	*Oncorhynchus mykiss 96hr LC50: 18 mg/l *Lepomis macrochirus 96 hr LC50: 18 mg/l *Micropterus	*Daphnia magna 48 hr EC50: 29-79 mg/l	No data available	No data available

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	salmoies 96 hr LC50: 51 mg/l *Ictalurus punctatus 96 hr LC50: 75 mg/l			
Ethyl Alcohol (Alcohol Stabilized Grade Only) 64-17-5 (< 1 %)	*LC50 Oncorhynchus mykiss: 12.0 - 16.0 mL/L 96h static *LC50 Pimephales promelas: 100 mg/L 96h static *LC50 Pimephales promelas: 13400 - 15100 mg/L 96h flow-through	*LC50 Daphnia magna: 9268 - 14221 mg/L 48h *EC50 Daphnia magna: 2 mg/L 48h	No data available	*LC50 Eisenia foetida (48 h filter paper) 0.1 - 1 mg/cm ²

Fish Toxicity:

Oncorhynchus mykiss 96hr LC50: 18 mg/l
Lepomis macrochirus 96 hr LC50: 18 mg/l
Micropterus salmoides 96 hr LC50: 51 mg/l
Ictalurus punctatus 96 hr LC50: 75 mg/l.

Algae Toxicity:

Chlamydomonas rein. 72 hr ErC50: 3.6-13.3 mg/l.

Invertebrate Toxicity:

Daphnia magna 48 hr EC50: 29-79 mg/l.

FATE AND TRANSPORT:

PERSISTENCE: Chloroform has a negligible tropospheric ozone creation potential in the atmosphere. No effect of chloroform can be expected on stratospheric ozone depletion and global warming as half-life of at least one year is necessary to expect such effects. Chloroform is not listed in the substances concerned by the Montreal Protocol on substances affecting the ozone layer. In addition, chloroform is not considered persistent in the environment because it undergoes natural degradation, primarily through atmospheric oxidation by hydroxyl radicals, which breaks it down over time. Its high volatility causes rapid evaporation from surface water and soil, further reducing its persistence. While chloroform can linger in groundwater due to limited light and air, overall, it does not accumulate significantly in living organisms or the environment, distinguishing it from persistent organic pollutants.

BIODEGRADATION: Biodegradation of chloroform occurs slowly and depends on both the presence of oxygen and specific microbial communities. Chloroform does not undergo significant biodegradation in surface waters or soils under typical aerobic environmental conditions, according to multiple studies. Degradation of chloroform occurs mainly under anaerobic conditions in sediments or specialized bioreactors, with half-lives ranging from 2 to 37 days, while certain methane-utilizing bacteria can degrade chloroform in soils only under specific circumstances. As indicated by the Henry's law constant, chloroform entering aquatic systems would be transferred to the atmosphere through volatilization. A half-life of 3.7 hours can be calculated from this constant using a water current of 1 m/sec a wind speed of 3 m/sec and 1 m depth. A field monitoring in the Rhine River gave a half-life of 1.2 days. In the atmosphere, indirect photolysis (reaction with OH radicals) occurs with half-life of approximately 15 to 23 weeks.

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BIOCONCENTRATION: Chloroform exhibits a low potential for bioaccumulation in aquatic organisms. Reported Bioconcentration Factor (BCF) values for various freshwater fish species generally range from 1.4 to 13, with most measurements falling well below thresholds of concern. For example, BCFs of 4–13 have been observed in carp, 1.6–2.5 in bluegill sunfish, and 3.34–10.34 in rainbow trout. Regulatory guidelines, such as those from the U.S. EPA, classify chemicals with BCF values below 250 as presenting low bioaccumulation concern, and chloroform's values are consistently within this range. Additionally, chloroform's physical and chemical properties—such as a low octanol-water partition coefficient and a tendency to volatilize from water—further reduce its likelihood of bioconcentration or accumulation in the food chain. Overall, chloroform does not significantly bioaccumulate in aquatic species or the environment.

BIOACCUMULATIVE POTENTIAL: Bioaccumulation of chloroform in aquatic species is unlikely in view of its physical, chemical and biological properties. The octanol water partition coefficient is small. Under these conditions the bioaccumulation through the food chain is highly unlikely. The following bioconcentration factors (BCF) have been reported for freshwater fish: Cyprinus Carpio 4-13

Lepomis macrochirus 1.6 – 2.5

Oncorhynchus mykiss 3.34 – 10.34.

MOBILITY IN SOIL: Chloroform exhibits high to moderate mobility in soil due to its low adsorption to soil particles and moderate water solubility, which allows it to readily leach into groundwater. Its volatility leads to rapid evaporation from surface soils, but if it penetrates deeper, it can persist in groundwater for many years, posing a long-term contamination risk. Overall, chloroform can easily migrate through soil and contaminate underlying water supplies.

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

Chloroform is not PBT / vPvB, as it partitions primarily to the atmosphere with a mean half-life of 70 days and does not accumulate in the environment. While chloroform fulfils the toxicity criterion, it is not considered persistent or bioaccumulative.

SECTION 13. DISPOSAL CONSIDERATIONS

Waste from material:

Reuse or reprocess, if possible. Keep out of water supplies, sewers, and soil. Contact a licensed professional waste disposal service to dispose of surplus and non-recyclable solutions. Dispose in accordance with all applicable regulations. If the material is to be incinerated, the chemical incinerator must be equipped with an afterburner (to assure complete combustion to prevent the formation of phosgene) and an acid scrubber (to remove the halo acids produced). All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Report spills if applicable. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator. AS YOUR SUPPLIER, WE HAVE NO CONTROL OVER THE MANAGEMENT PRACTICES OR MANUFACTURING PROCESSES OF PARTIES HANDLING OR USING THIS MATERIAL. THE INFORMATION PRESENTED HERE PERTAINS ONLY TO THE PRODUCT AS SHIPPED IN ITS INTENDED CONDITION AS DESCRIBED IN SDS SECTION: Composition Information (FOR UNUSED & UNCONTAMINATED PRODUCT).

Container Management:

Dispose of container in accordance with applicable local, regional, national, and/or international regulations. Container

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rinsate must be disposed of in compliance with applicable regulations. Puncture container to avoid re-use.

Contaminated Material:

Contaminated material must be disposed of in a permitted waste management facility. 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: UN1888
PROPER SHIPPING NAME: Chloroform
HAZARD CLASS/ DIVISION: 6.1
PACKING GROUP: III
LABELING REQUIREMENTS: 6.1
RQ (Lbs.): RQ 10 Lbs. (Chloroform)

Special provisions for transport: IB3, N36, T7, TP2.

Packaging Exceptions 153.
Non-bulk Packaging: 203.
Bulk Packaging: 241.

CANADIAN TRANSPORTATION OF DANGEROUS GOODS:

UN NUMBER: UN1888
SHIPPING NAME: Chloroform
CLASS OR DIVISION: 6.1
PACKING/RISK GROUP: III
LABELING REQUIREMENTS: 6.1

MARITIME TRANSPORT (IMO / IMDG)

UN NUMBER: UN1888
PROPER SHIPPING NAME: Chloroform
HAZARD CLASS / DIVISION: 6.1
Packing Group: III
LABELING REQUIREMENTS: 6.1

AIR TRANSPORT (ICAO / IATA)

Special Instructions CAO: IATA Certificate for shipping personnel is required

SECTION 15. REGULATORY INFORMATION

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U.S. REGULATIONS**OSHA REGULATORY STATUS:**

Health hazard classifications were performed using OSHA Hazard Communication 2024 (1910.1200) Appendix A and/or UN GHS Rev. 8 (2019). 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)
Chloroform 67-66-3 (> 99 %)	10 lbs. (RQ)	10 lbs. (RQ)	10 lbs. (EPCRA RQ)	10,000 lbs. TPQ
Ethyl Alcohol (Alcohol Stabilized Grade Only) 64-17-5 (< 1 %)	Not listed	Not listed	Not listed	Not Listed

SARA EHS Chemical (40 CFR 355.30)

If a release is reportable under EPCRA, notify the state emergency response commission and local emergency planning committee. If the TPQ is met, facilities are subject to reporting requirements under EPCRA Sections 311 and 312.

SARA HAZARD CATEGORIES ALIGNED WITH GHS (2018):

Health Hazard - Acute Toxin (any route of exposure)
Health Hazard - Carcinogen
Health Hazard - Reproductive Toxin
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
Chloroform 67-66-3 (> 99)	0.1% (de minimis concentration)	Not Listed
Ethyl Alcohol (Alcohol Stabilized Grade Only) 64-17-5 (< 1)	Not Listed	Not Listed

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

The following components are regulated under DHS:

Component	DHS - Security Issues	DHS-Sabotage Screening Threshold Qnty.	DHS-Sabotage Min. Conc.	DHS-Theft Screening Threshold Qnty.	DHS-Theft Min. Conc.	DHS-Release Screening Threshold Qnty.	DHS-Release Min. Conc.	CWC Toxic Chemicals:
Chloroform	Release - Toxic	Not Listed	Not Listed	Not Listed	Not Listed	20,000 lbs.	1.0% Minimum	Not Listed

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67-66-3 (> 99)						STQ	Concentration	
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OSHA PROCESS SAFETY (PSM) (29 CFR 1910.119):
 Regulated.

Component	EPA RMP Toxic or Flammable TPQ	PSM - Highly Hazardous Substances, Toxics and Reactives	Flash Point
Chloroform 67-66-3 (> 99)	Toxic (20,000 lbs. threshold quantity)	Not Listed	

FDA: The manufacturing process for Alcohol Stabilized Chloroform does not incorporate all of the measures specified in the U.S. Food and Drug Administration's current Good Manufacturing Practices (cGMP). It is the responsibility of the user to assess their use of Alcohol Stabilized Chloroform products in food, feed, or pharmaceutical related applications and to determine whether appropriate regulatory requirements are being met.

EPA'S CLEAN WATER AND CLEAN AIR ACTS:
 Regulated as noted in table below.

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
Chloroform 67-66-3 (> 99 %)	Present	Not Listed	Present	Present	Present	Present	Not Listed	Toxic (20,000 lbs. threshold quantity)
Ethyl Alcohol (Alcohol Stabilized Grade Only) 64-17-5 (< 1 %)	Not Listed	Not Listed	Present	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 LIST	TSCA 12(b)	TSCA/Section 4	TSCA/Section 5	TSCA/Section 6	TSCA/Section 8
Chloroform 67-66-3 (> 99 %)	Listed	ACTIVE	Not Listed	Not listed	Not Listed	Not Listed	Listed
Ethyl Alcohol (Alcohol Stabilized Grade Only) 64-17-5 (< 1 %)	Listed	ACTIVE	Not Listed	Not listed	Not Listed	Not Listed	Not listed

TSCA 12(b):

- This product is not subject to export notification

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

Component	DSL	NDSL
Chloroform 67-66-3 (> 99)	Listed	Not Listed
Ethyl Alcohol (Alcohol Stabilized Grade Only) 64-17-5 (< 1)	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

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other reproductive harm as listed under Proposition 65 State Drinking Water and Toxic Enforcement Act. For additional information, contact OxyChem Technical Services.

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
Chloroform 67-66-3 (> 99 %)	Listed	Listed - developmental toxicity	Not Listed	Not Listed	Listed	Listed
Ethyl Alcohol (Alcohol Stabilized Grade Only) 64-17-5 (< 1 %)	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
Chloroform	0388	Carcinogen	Listed	Listed	Pennsylvania Right to Know Special Hazardous Substances	Environmental hazard
Ethyl Alcohol (Alcohol Stabilized Grade Only)	0844	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
Chloroform 67-66-3 (> 99)	Part 2 (2.060)	Part 1, Group A Substance (050)	Not Listed	Listed	Not Listed
Ethyl Alcohol (Alcohol Stabilized Grade Only) 64-17-5 (< 1)	Part 2 (2.060)	Part 5 Substance-Volatile Organic Compounds with Additional Reporting Requirements (276)	Not Listed	Listed	Not Listed

SECTION 16. OTHER INFORMATION

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

Rev. Date: 03-Dec-2025

Reason for Revision:

- Scheduled review
- SDS format adopts revisions to the Hazardous Products Regulations (HPR) to include revisions to "Section 9:

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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.

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