

Material Safety Data Sheet

Chloroform

ACC# 95979

Section 1 - Chemical Product and Company Identification

MSDS Name: Chloroform

Catalog Numbers: AC158210000, AC158210010, AC158210025, AC158210250, AC167730000, AC167730010, AC167730025, AC167735000, AC232090000, AC232090010, AC232090025, AC268320000, AC268320010, AC268320025, AC326670000, AC326670010, AC326670025, AC326820000, AC326820010, AC326821000, AC326822500, AC364320000, AC364320010, AC364321000, AC404630000, AC404635000, AC423550000, AC423550040, AC423550250, AC423555000, AC610030040, AC610281000, S79960, S799601, S79960HPLC1, S79960SPEC1, S79960SPEC2, S79969ACS1, S79969ACS2, BP1145-1, BP2606-100, C294-1, C294-4, C295-20, C295-4, C295S-4, C297-4, C2974LC, C297POP19, C297POP200, C297POP50, C297RS115, C297RS28, C297SS115, C297SS19, C297SS200, C297SS28, C297SS50, C298-1, C298-20, C298-200, C298-4, C298-500, C29820LC, C298FB115, C298FB19, C298FB200, C298FB50, C298J1, C298POP19, C298POP200, C298POP50, C298POPB19, C298POPB200, C298POPB50, C298RB115, C298RB200, C298RS115, C298RS19, C298RS200, C298RS28, C298RS50, C298S-4, C298SK-4, C298SS19, C574-1, C574-4, C574SK-4, C603-4, C606-1, C606-4, C606POP19, C606POP200, C606POP50, C606RS115, C606RS28, C606SK-1, C606SK-4, C606SS115, C606SS19, C606SS200, C606SS28, C606SS50, C607-1, C607-4, C607J4, C607SK-1, C607SK-4, NC9002591, NC9543674

Synonyms: Formyl trichloride; Methane trichloride; Methenyl trichloride; Methyl trichloride; Trichloroform; Trichloromethane.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
67-66-3	Chloroform	99+	200-663-8

Hazard Symbols: XN

Risk Phrases: 22 38 40 48/20/22

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: clear, colorless liquid. May cause central nervous system depression. May cause cardiac disturbances. May cause cancer based on animal studies. This substance has caused adverse reproductive and fetal effects in animals. May be harmful if swallowed. **Caution!** Causes eye and skin irritation. Light sensitive. Causes respiratory tract irritation.

Target Organs: Blood, kidneys, heart, central nervous system, liver, cardiovascular system, excretory system, reproductive system.

Potential Health Effects

Eye: Causes moderate eye irritation. Contact with liquid causes immediate burning pain, tearing, and reddening of the conjunctiva.

Skin: Causes mild skin irritation. Absorption of liquid through intact skin is possible and may cause systemic poisoning if contact with liquid is prolonged.

Ingestion: Causes gastrointestinal irritation with nausea, vomiting and diarrhea. May cause liver damage. May cause cardiac disturbances. Aspiration of material into the lungs may cause chemical pneumonitis, which may be fatal. Possible aspiration hazard. May cause hallucinations and distorted perceptions.

Inhalation: Inhalation of high concentrations may cause central nervous system effects characterized by nausea, headache, dizziness, unconsciousness and coma. May cause cardiac sensitization and possible failure. Inhalation of large amounts may cause respiratory stimulation, followed by respiratory depression, convulsions and possible death due to respiratory paralysis. May be absorbed through the lungs. Causes irritation of the mucous membrane and upper respiratory tract.

Chronic: Possible cancer hazard based on tests with laboratory animals. Prolonged or repeated skin contact may cause defatting and dermatitis. May cause reproductive and fetal effects. Effects may be delayed. Laboratory experiments have resulted in mutagenic effects. Toxicity may be increased by exposure to alcohol, steroids, and ketones. Prolonged exposure may cause liver, kidney, and heart damage.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Do not induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

Inhalation: Get medical aid immediately. Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.

Notes to Physician: Causes cardiac sensitization to endogenous catecholamines which may lead to cardiac arrhythmias. Do NOT use adrenergic agents such as epinephrine or pseudoepinephrine. Persons with liver, kidney, or central nervous system diseases may be at increased risk from exposure to this product. Alcoholic beverage consumption may enhance the toxic effects of this substance. Effects may be delayed.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Use water spray to keep fire-exposed containers cool. Substance is nonflammable. Vapors may be heavier than air. They can spread along the ground and collect in low or confined areas. Containers may explode when heated. Non-combustible, substance itself does not burn but may decompose upon heating to produce corrosive and/or toxic fumes. Non-combustible, substance itself does not burn but may decompose upon heating to produce irritating, corrosive and/or toxic fumes. Approach fire

from upwind to avoid hazardous vapors and toxic decomposition products. Not combustible, but if involved in a fire, decomposes to produce hydrogen chloride.

Extinguishing Media: Use extinguishing media most appropriate for the surrounding fire.

Flash Point: Not available.

Autoignition Temperature: Not available.

Explosion Limits, Lower: Not available.

Upper: Not available.

NFPA Rating: (estimated) Health: 2; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable container. Avoid runoff into storm sewers and ditches which lead to waterways. Clean up spills immediately, observing precautions in the Protective Equipment section. Provide ventilation. Approach spill from upwind.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use only in a well-ventilated area. Avoid contact with eyes, skin, and clothing. Do not breathe dust, vapor, mist, or gas. Do not ingest or inhale. Store protected from light.

Storage: Do not store in direct sunlight. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep away from acids. Do not store near alkaline substances. Separate from strong mineral acids.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Chloroform	10 ppm TWA	500 ppm IDLH	50 ppm Ceiling; 240 mg/m ³ Ceiling

OSHA Vacated PELs: Chloroform: 2 ppm TWA; 9.78 mg/m³ TWA

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant a respirator's use.

Section 9 - Physical and Chemical Properties

Physical State: Liquid
Appearance: clear, colorless
Odor: sweet, fruity odor - ethereal odor
pH: Not available.
Vapor Pressure: 160 mm Hg @ 20 deg C
Vapor Density: 4.12 (Air=1)
Evaporation Rate: 11.6 (Butyl acetate=1)
Viscosity: 0.58 cps @ 20 deg C
Boiling Point: 60.5-61.5 deg C
Freezing/Melting Point: -63 deg C
Decomposition Temperature: Not available.
Solubility: Slightly soluble.
Specific Gravity/Density: 1.492 (Water=1)
Molecular Formula: CHCl₃
Molecular Weight: 119.366

Section 10 - Stability and Reactivity

Chemical Stability: Stable at room temperature in closed containers under normal storage and handling conditions. Light sensitive.
Conditions to Avoid: High temperatures, incompatible materials, light.
Incompatibilities with Other Materials: Acetone + alkali, disilane, nitrogen tetroxide, perchloric acid + phosphorus pentoxide, potassium tert-butoxide, sodium methylate, dinitrogen tetroxide, fluorine, chemically active metals, triisopropylphosphine, caustics (e.g. ammonia, ammonium hydroxide, calcium hydroxide, potassium hydroxide, sodium hydroxide), powdered aluminum, powdered magnesium, alkali metals, sodium hydroxide + methanol.
Hazardous Decomposition Products: Hydrogen chloride, irritating and toxic fumes and gases, carbon dioxide, chlorine, phosgene gas.
Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 67-66-3: FS9100000

LD50/LC50:

CAS# 67-66-3:

Draize test, rabbit, eye: 148 mg;
 Draize test, rabbit, eye: 20 mg/24H Moderate;
 Draize test, rabbit, skin: 500 mg/24H Mild;
 Inhalation, rat: LC50 = 47702 mg/m³/4H;
 Oral, mouse: LD50 = 36 mg/kg;
 Oral, rat: LD50 = 695 mg/kg;
 Skin, rabbit: LD50 = >20 gm/kg;

Carcinogenicity:

CAS# 67-66-3:

ACGIH: A3 - Confirmed animal carcinogen with unknown relevance to humans

California: carcinogen, initial date 10/1/87

NIOSH: potential occupational carcinogen

NTP: Suspect carcinogen

OSHA: Possible Select carcinogen

IARC: Group 2B carcinogen

Epidemiology: Oral, rat: TDLo = 13832 mg/kg/2Y-C (Tumorigenic - Carcinogenic by RTECS criteria - Blood - leukemia).; Oral, mouse: TDLo = 127 gm/kg/92W-I (Tumorigenic - Carcinogenic by RTECS criteria - Liver - tumors).; Oral, rat: TD = 98 gm/kg/78W-I (Tumorigenic - neoplastic by RTECS criteria - Kidney, Ureter, Bladder - Kidney tumors and Endocrine - thyroid tumors).; Oral, mouse: TD = 18 gm/kg/17W-I (Tumorigenic - neoplastic by RTECS criteria - Liver - tumor s).;

Teratogenicity: Oral, rat: TDLo = 1260 mg/kg (female 6-15 day(s) after conception) Effects on Embryo or Fetus - fetotoxicity (except death, e.g., stunted fetus) Specific Developmental Abnormalities - musculoskeletal system.; Inhalation, rat: TCLo = 100 ppm/7H (female 6-15 day(s) after conception) Specific Developmental Abnormalities - gastrointestinal system and homeostasis.; Inhalation, mouse: TCLo = 100 ppm/7H (female 8-15 day(s) after conception) Specific Developmental Abnormalities - craniofacial (including nose and tongue).

Reproductive Effects: Inhalation, rat: TCLo = 30 ppm/7H (female 6-15 day(s) after conception) Fertility - other measures of fertility.; Inhalation, rat: TCLo = 300 ppm/7H (female 6-15 day(s) after conception) Fertility - female fertility index (e.g. # females pregnant per # sperm positive females; # females pregnant per # females mated) and post-implantation mortality (e.g. dead and/or resorbed implants per total number of implants).

Neurotoxicity: No information available.

Mutagenicity: DNA Inhibition: Human, HeLa cell = 19 mmol/L.; Sister Chromatid Exchange: Human, Lymphocyte = 10 mmol/L.; Micronucleus Test: Oral, rat = 4 mmol/kg.; Unscheduled DNA Synthesis: Oral, rat = 1 gm/kg.; Sister Chromatid Exchange: Hamster, Embryo = 100 umol/L.

Other Studies: Open irritation test: Administration onto the skin (rabbit) 10 mg/24H (Mild). Standard Draize Test: Administration onto the skin (rabbit) = 500 mg/24H (Mild). Standard Draize Test: Administration into the eye (rabbit) = 20 mg /24H (Moderate).

Section 12 - Ecological Information

Ecotoxicity: Fish: Channel catfish: LC50 = 75 ppm; 96 Hr; Unspecified Fish: Rainbow trout: LC50 = 43.8 mg/L; 96 Hr; Static bioassay Fish: Fathead Minnow: LC50 = 129.0 mg/L; 96 Hr; Static bioassay (pH = 7.6-8.3) Fish: Bluegill/Sunfish: LC50 = 100.0 mg/L; 96 Hr; Static bioassay Water flea Daphnia: EC50 = 28.9 mg/L; 48 Hr; Static bioassay The majority of the environmental releases from industrial uses are to the atmosphere; releases to water and land will be primarily lost by evaporation and will end up in the atmosphere. Release to the atmosphere may be transported long distances and will photodegrade with a half-life of a few months. Spills and other releases on land will also leach into the groundwater where it will reside for long periods of time.

Environmental: Chloroform will not be expected to bioconcentrate into the food chain but contamination of food is likely due to its use as an extractant and its presence in drinking water.

Physical: No information available.

Other: No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

European/International Regulations**European Labeling in Accordance with EC Directives****Hazard Symbols:**

XN

Risk Phrases:

R 22 Harmful if swallowed.

R 38 Irritating to skin.

R 40 Limited evidence of a carcinogenic effect.

R 48/20/22 Harmful : danger of serious damage to health by prolonged exposure through inhalation and if swallowed.

Safety Phrases:

S 36/37 Wear suitable protective clothing and gloves.

WGK (Water Danger/Protection)

CAS# 67-66-3: 3

Canada - DSL/NDSL

CAS# 67-66-3 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2A, D1B.

Canadian Ingredient Disclosure List

CAS# 67-66-3 is listed on the Canadian Ingredient Disclosure List.

Exposure Limits

CAS# 67-66-3: OEL-ARAB Republic of Egypt:TWA 10 ppm (50 mg/m³) OEL-AUSTRALIA:TWA 10 ppm (50 mg/m³);Carcinogen OEL-AUSTRIA:TWA 10 ppm (50 mg/m³) OEL-BELGIUM:TWA 10 ppm (49 mg/m³);Carcinogen JAN9 OEL-CZECHO SLOVAKIA:TWA 10 mg/m³;STEL 20 mg/m³ OEL-DENMARK:TWA 2 ppm (10 mg/m³); Carcinogen OEL-FINLAND:TWA 10 ppm (50 mg/m³);STEL 20 ppm;Skin;CAR OE L-FRANCE:TWA 5 ppm (25 mg/m³);STEL 50 ppm (250 mg/m³);CAR OEL-GERMANY :TWA 10 ppm (50 mg/m³);Carcinogen JAN9 OEL-HUNGARY:STEL 10 mg/m³ OEL -INDIA:TWA 10 ppm (50 mg/m³);Carcinogen OEL-JAPAN:TWA 50 ppm (240 mg/ m³);Carcinogen OEL-THE NETHERLANDS:TWA 10 ppm (50 mg/m³) OEL-THE PHI LIPPINES:TWA 50 ppm (240 mg/m³) OEL-POLAND:TWA 50 mg/m³ OEL-RUSSIA:T WA 50 ppm OEL-SWEDEN:TWA 2 ppm (10 mg/m³);STEL 5 ppm (25 mg/m³);CAR OEL-SWITZERLAND:TWA 10 ppm (50 mg/m³);STEL 20 ppm (100 mg/m³) OEL-THA ILAND:TWA 50 ppm (240 mg/m³) OEL-TURKEY:TWA 50 ppm (240 mg/m³) OEL-U NITED KINGDOM:TWA 2 ppm (9.9 mg/m³);Skin OEL IN BULGARIA, COLOMBIA, J ORDAN, KOREA check ACGIH TLV OEL IN NEW ZEALAND, SINGAPORE, VIETNAM c heck ACGIH TLV

Section 16 - Additional Information**MSDS Creation Date:** 6/09/1999**Revision #8 Date:** 4/13/2004

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