

PRODUCT NAME: TRICHLOROETHYLENE**1. Chemical Product and Company Identification****BOC Gases,
Division of,
The BOC Group, Inc.
575 Mountain Avenue
Murray Hill, NJ 07974****TELEPHONE NUMBER: (908) 464-8100
24-HOUR EMERGENCY TELEPHONE
NUMBER: CHEMTREC (800) 424-9300****BOC Gases
Division of
BOC Canada Limited
5975 Falbourne Street, Unit 2
Mississauga, Ontario L5R 3W6****TELEPHONE NUMBER: (905) 501-1700
24-HOUR EMERGENCY TELEPHONE
NUMBER: (905) 501-0802
EMERGENCY RESPONSE PLAN NO: 2-0101****PRODUCT NAME: TRICHLOROETHYLENE
CHEMICAL NAME: Trichloroethylene
COMMON NAMES/SYNONYMS: Trichloroethylene, Trichlor
TDG (Canada) CLASSIFICATION: 6.1 (9.2)
WHMIS CLASSIFICATION: D1B, D2A, D2B****PREPARED BY: Loss Control (908)464-8100/(905)501-1700
PREPARATION DATE: 6/1/95
REVIEW DATES: 6/1/99****2. Composition, Information on Ingredients****EXPOSURE LIMITS¹:**

INGREDIENT	% VOLUME	PEL-OSHA ²	TLV-ACGIH ³	LD ₅₀ or LC ₅₀ Route/Species
TRICHLOROETHYLENE FORMULA: C ₂ HCl ₃ CAS: 79-01-6 RTECS #: KX4550000	> 99	100 ppm TWA 200 ppm Ceiling 300 ppm 5-minute peak	50 ppm TWA, A5 100 ppm STEL	LC ₅₀ : 8450 ppm Inhalation/mouse

¹ Refer to individual state of provincial regulations, as applicable, for limits which may be more stringent than those listed here.² As stated in 29 CFR 1910, Subpart Z (revised July 1, 1993)³ As stated in the ACGIH 1998-1999 Threshold Limit Values for Chemical Substances and Physical Agents.

OSHA Regulatory Status: This material is classified as hazardous under OSHA regulations.

IDLH: 1,000 ppm

3. Hazards Identification**EMERGENCY OVERVIEW**

Colorless combustible liquid with sweet odor resembling chloroform. Direct contact with liquid form is irritating to the eyes, skin and mucous membranes. Inhaled vapor has an anesthetic or narcotic effect at high concentrations. Exposure to flame or arc will cause slow burning and decomposition into phosgene and hydrochloric acid. Cylinder contents under pressure. Use and store below 125 °F.

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ROUTE OF ENTRY:

Skin Contact Yes	Skin Absorption No	Eye Contact Yes	Inhalation Yes	Ingestion Yes
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HEALTH EFFECTS:

Exposure Limits Yes	Irritant Yes	Sensitization No
Teratogen No	Reproductive Hazard No	Mutagen Yes
Synergistic Effects Other agents that depress the central nervous system		

Carcinogenicity: -- NTP: No IARC: Yes (2A) OSHA: No*

* Although OSHA has not promulgated a specific standard for trichloroethylene, this product should be treated as a potential human carcinogen for Hazard Communication purposes (29 CFR, 1910.1200(d)(4))

EYE EFFECTS:

Trichloroethylene is irritating to the eyes.

SKIN EFFECTS:

Irritating to the skin and mucosal tissues.

INGESTION EFFECTS:

Mildly toxic by ingestion with effects similar to inhalation.

INHALATION EFFECTS:

Inhalation has an anesthetic or narcotic effect causing headache, dizziness, and possibly nausea. At higher concentrations it can cause unconsciousness. Prolonged exposure to high concentrations **may result** in death from cardiac failure or respiratory arrest.

Repeated exposure may adversely affect the liver and kidneys and increase the risks of developing liver cancer.

Trichloroethylene is classified by IARC as an "agent which is probably carcinogenic to humans". It has exhibited carcinogenic effects in animal studies.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: May aggravate pre-existing eye and skin disorders. Individuals with pre-existing CNS and liver conditions may be more susceptible to effects of trichloroethylene.

NFPA HAZARD CODES

Health: 2
Flammability: 1
Instability: 0

HMIS HAZARD CODES

Health: 2
Flammability: 1
Reactivity: 0

RATINGS SYSTEM

0 = No Hazard
1 = Slight Hazard
2 = Moderate Hazard
3 = Serious Hazard
4 = Severe Hazard

4. First Aid Measures

EYES:

Flush eyes with large amounts of water for at least 15 minutes. If irritation persists, seek medical attention.

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SKIN:

Remove contaminated clothing and flush affected area with water. If irritation persists, a physician should see the patient promptly.

INGESTION:

PROMPT MEDICAL ATTENTION IS MANDATORY IN ALL CASES OF INGESTION. If conscious: Drink large quantities of water. Do not induce vomiting.

INHALATION:

PROMPT MEDICAL ATTENTION IS MANDATORY IN ALL CASES OF OVEREXPOSURE. RESCUE PERSONNEL SHOULD BE EQUIPPED WITH SELF-CONTAINED BREATHING APPARATUS. Conscious persons should be assisted to an uncontaminated area and inhale fresh air. Quick removal from the contaminated area is most important. Unconscious persons should be moved to an uncontaminated area and given artificial resuscitation and supplemental oxygen. Medical assistance should be sought immediately. Further treatment should be symptomatic and supportive. THE PHYSICIAN SHOULD BE INSTRUCTED NOT TO USE ADRENALINE AS A STIMULANT IN CASES OF TRICHLOROETHYLENE POISONING.

5. Fire Fighting Measures

Conditions of Flammability: Not flammable		
Flash point: None	Method: By DOT	Autoignition Temperature: 788° F. (420° C.)
LEL(%): 8 (@25 °C) 7.8 (@ 100 °C)	UEL(%): 10.5 (@ 25 °C) 52 (@ 100 °C)	
Hazardous combustion products: Phosgene and hydrogen chloride		
Sensitivity to mechanical shock: None		
Sensitivity to static discharge: Not available		

FIRE AND EXPLOSION HAZARDS:

Combustible liquid. No flash point in conventional closed tester; however, vapors in containers may explode if subjected to a high energy source. Vapor is non-flammable under test conditions, but can be made to burn mildly if a strong flame is applied in air.

EXTINGUISHING MEDIA:

Water, carbon dioxide or dry chemical. Use media appropriate for surrounding fire.

FIRE FIGHTING INSTRUCTION:

Fire fighters should use full facepiece self-contained breathing apparatus and bunker gear worn in combination with chemical protective clothing as necessary to prevent exposure. Use water spray to cool adjacent areas. Continue to cool fire-exposed containers until well after flames are extinguished.

6. Accidental Release Measures

Evacuate all personnel from affected area. Vapors are heavier than air and will accumulate in low lying areas. Use appropriate protective equipment. Recover spilled material in absorbents such as sawdust or vermiculite and place in clean, dry, tightly closed container for later disposal. Dike well ahead of large spills. Extinguish ignition sources to prevent formation of toxic gases. If leak is in container of container valve, contact the appropriate emergency telephone number listed in Section 1 or call your closest BOC location.

7. Handling and Storage

Electrical classification:

Nonhazardous.

Trichloroethylene can be handled in most common materials of construction. May react violently with aluminum, titanium, magnesium or their alloys.

This product is packaged in drums and cylinders.

Store upright in cool, dry, well-ventilated area of non-combustible construction away from heavily trafficked areas and emergency exits. Separate from strong caustics, alkalis, oxidizers and chemically active metals, and other incompatible materials. Post "NO SMOKING" signs in storage and use area. There should be no source for accidental ignition in use and storage areas. Outside or detached storage is preferred.

Use only in areas equipped with appropriate ventilation systems. Keep container tightly closed when not in use. Protect full and empty containers from physical damage and heat. Do not weld on or near full or empty containers. Do not re-use empty containers. Empty containers contain product residue, recycle and dispose of accordingly. Segregate full and empty drums and cylinders. Use a "first in-first out" inventory system to prevent product from being stored for excessive periods of time. Do not drag, slide, or roll cylinders or drums. Use a suitable hand truck, drum truck or other appropriate equipment.

For cylinders: Valve protection caps must remain in place unless container is secured with valve outlet piped to use point. Use a pressure reducing regulator when connecting cylinder to lower pressure piping or systems (< 300 psig). Do not heat cylinder by any means to increase rate of product from cylinder. Use a check valve or trap in the discharge line to prevent hazardous back flow into cylinder. Do not allow the temperature where cylinders are stored to exceed 125 °F (52 °C). Cylinders should be firmly secured to prevent falling or being knocked over. For additional recommendations consult Compressed Gas Association's Pamphlet P-1.

Do not eat, drink, smoke, or apply cosmetics in areas where this product is used or stored. Do not store cigarettes, food or other personal items in storage and use areas. Wash hands and face thoroughly after handling and before meals and breaks. Change contaminated clothing promptly. Segregate contaminated clothing and launder appropriately. Shower at the end of the work shift.

Do not carry this product in an enclosed space such as a car trunk, van or station wagon. A leak can result in a toxic exposure.

8. Exposure Controls, Personal Protection

ENGINEERING CONTROLS:

Use local exhaust to prevent accumulation above the exposure limit.

EYE/FACE PROTECTION:

Safety goggles or full facepiece respirator.

SKIN PROTECTION:

Protective gloves, apron, etc. of suitable material should be worn as necessary to prevent exposure (Polyvinyl alcohol (PVA) and Viton™ are effective for exposures > 8 hours).

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RESPIRATORY PROTECTION:

Positive pressure air line with mask and escape bottle, or self contained breathing apparatus, should be available for general use.

OTHER/GENERAL PROTECTION:

Safety shoes, safety shower, eyewash "fountain," faceshield.

9. Physical and Chemical Properties

PARAMETER	VALUE	UNITS
Physical state (gas, liquid, solid)	: Liquid	
Vapor pressure (20° C.)	: 57.8	Torr
Vapor density (Air = 1)	: 4.54	
Evaporation point	: Not Available	
Boiling point	: 187-190	°F
	: 86-88	°C
Freezing point	: -123.5	°F
	: -86.4	°C
pH	: 6.7-7.5	
Specific gravity	: 1.465	
Oil/water partition coefficient	: Not Available	
Solubility (H ₂ O)	: 0.11	Weight %
Odor threshold	: 82 ppm	
Odor and appearance	: Colorless liquid with ether-like odor.	

10. Stability and Reactivity

STABILITY:

Stable.

INCOMPATIBLE MATERIALS:

Incompatible with strong caustics, alkalis, oxidizers and chemically active metals (i.e.: barium, lithium, etc.). May react violently with aluminum, barium, nitrogen tetroxide, lithium, magnesium, liquid oxygen, potassium hydroxide, potassium permanganate, sodium hydroxide or titanium. Reacts with water under heat and pressure to form hydrochloric acid.

HAZARDOUS DECOMPOSITION PRODUCTS:

Slowly decomposes to hydrochloric acid in the presence of light and moisture. Thermal decomposition yields phosgene and hydrogen chloride.

HAZARDOUS POLYMERIZATION:

Will not occur.

11. Toxicological Information

SKIN AND EYE EFFECTS:

Standard Draize test produced moderate reaction in rabbit (20 mg/24H). Standard Draize test produced severe reaction in rabbit (20 mg/24H).

INGESTION EFFECTS:

Oral LD₅₀ dose of 5650 mg/kg in rats. Systemic effects in humans similar to inhalation.

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INHALATION EFFECTS:

Prolonged inhalation may cause headache and drowsiness. High exposures produce narcosis. Exposure of 110 ppm for 8 hours produced hallucinations and distorted perceptions in an exposed individual. In laboratory animals, death results from respiratory failure or cardiac arrest.

A cardiac sensitizer, severe exposures may result in ventricular fibrillation and resultant cardiac failure.

CHRONIC:

Chronic exposure to high concentrations is toxic to the liver and kidneys. Chronic inhalation studies above current exposure limits produced carcinogenic effects in rats and mice. Classified as IARC Group 2A, probably carcinogenic to humans. Classified by ACGIH as A5, not suspected as a human carcinogen.

REPRODUCTIVE:

No embryotoxic or teratogenic effects were noted in several inhalation experiments (Sprague-Dawley rats and Swiss-Webster mice). Decreased fetal body weight occurred in rats exposed 4 H/day throughout pregnancy at 100 ppm.

MUTATIONS:

Available genotoxicity data suggest that TCE may be a weak indirect mutagen causing effects in a number of test systems representing a wide range of organisms.

12. Ecological Information

None data given.

13. Disposal Considerations

Do not attempt to dispose of residual waste or unused quantities. Return in the shipping container PROPERLY LABELED, WITH ANY VALVE OUTLET PLUGS OR CAPS SECURED AND VALVE PROTECTION CAP IN PLACE to BOC Gases or authorized distributor for proper disposal.

14. Transport Information

PARAMETER	United States DOT	Canada TDG
PROPER SHIPPING NAME:	Trichloroethylene	Trichloroethylene
HAZARD CLASS:	6.1	6.1 (9.2)
IDENTIFICATION NUMBER:	UN 1710	UN 1710
SHIPPING LABEL:	POISON	POISON

Packing Group III

Additional Marking Requirement: If net weight of product \geq 100 pounds, the container must be also marked with the letters "RQ".

Additional Shipping Paper Description Requirement: If net weight of product \geq 100 pounds, the shipping papers must be also marked with the letters "RQ".

15. Regulatory Information

SARA TITLE III NOTIFICATIONS AND INFORMATION

SARA TITLE III - HAZARD CLASSES:

Acute Health Hazard
Chronic Health Hazard

SARA TITLE III – SECTION 313 SUPPLIER NOTIFICATION

This product contains the following toxic chemicals subject to the reporting requirements of section 313 of the Emergency Planning and Community Right-To-Know Act (EPCRA) of 1986 and 40 CFR 372:

CAS NUMBER	INGREDIENT NAME	PERCENT BY VOLUME
79-01-6	Trichloroethylene	> 99%

CERCLA/SUPERFUND, 40 CFR 117, 302:

This product contains trichloroethylene, a Reportable Quantity (RQ) Substance, and if 100 pounds of trichloroethylene are released, notification to the National Response Center, Washington, DC (1-800-424-8802) is required.

RCRA INFORMATION:

Trichloroethylene is listed as an RCRA hazardous waste (40 CFR 261.33). Empty containers, as defined in 40 CFR 261.7, are exempted from RCRA requirements.

CALIFORNIA PROPOSITION 65:

This product contains trichloroethylene, an ingredient known to the State of California to cause cancer.

16. Other Information

ACGIH	American Conference of Governmental Industrial Hygienists
DOT	Department of Transportation
IARC	International Agency for Research on Cancer
NTP	National Toxicology Program
OSHA	Occupational Safety and Health Administration
PEL	Permissible Exposure Limit
SARA	Superfund Amendments and Reauthorization Act
STEL	Short Term Exposure Limit
TDG	Transportation of Dangerous Goods
TLV	Threshold Limit Value
WHMIS	Workplace Hazardous Materials Information System

Compressed gas cylinders shall not be refilled without the express written permission of the owner. Shipment of a compressed gas cylinder which has not been filled by the owner or with his/her (written) consent is a violation of transportation regulations.

DISCLAIMER OF EXPRESSED AND IMPLIED WARRANTIES:

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