Univar USA Inc Material Safety Data Sheet

MSDS No:	DZ40174
Version No:	010 2007-11-09
Order No:	

Univar USA Inc., 17425 NE Union Hill Rd., Redmond WA 98052
(425) 889 3400

Emergency Assistance

For emergency assistance involving chemicals call
Chemtrec - (800) 424-9300

The Version Date and Number for this MSDS is : 11/09/2007 - #010

PRODUCT NAME: TRICHLOROETHYLENE

MSDS NUMBER: DZ40174

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ISSUED BY: 008360

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Material Safety Data Sheet

1. Product and Company Identification

Product Name
TRICHLOROETHYLENE

Distributed by:
Univar USA Inc.
17425 NE Union Hill Road
Redmond, WA 98052
425-889-3400

2. Hazards Identification

Emergency Overview
Color: Colorless
Physical State: Liquid
Odor: Characteristic

Hazards of product:
WARNING! May cause central nervous system effects; can cause death if too much is breathed. Harmful if inhaled. Harmful if swallowed. May cause eye irritation. May cause skin irritation. Aspiration hazard. Can enter lungs and cause damage. May cause irregular heartbeats based on animal data. Isolate area. Keep upwind of spill. Stay out of low areas. Toxic fumes may be released in fire situations.

OSHA Hazard Communication Standard
This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

Potential Health Effects

Annotation:

Eye Contact: May cause pain disproportionate to the level of irritation to eye tissues. May cause slight eye irritation. Corneal injury is unlikely. Vapor may cause eye irritation experienced as mild discomfort and redness.

Skin Contact: Prolonged or repeated contact may cause skin irritation. May cause drying and flaking of the skin. May cause more severe response on covered skin (under clothing, gloves). Skin Absorption: Prolonged skin contact is unlikely to result in absorption of harmful amounts. Trichloroethylene may be absorbed through the skin and may cause numbness in fingers immersed in the liquid.

Inhalation: In confined or poorly ventilated areas, vapor can readily accumulate and can cause unconsciousness and death. Excessive exposure may cause irritation to upper respiratory tract (nose and throat). Excessive exposure may increase sensitivity to epinephrine and increase myocardial irritability (irregular heartbeats). May cause alcohol intolerance often manifested by temporary reddening of the skin called 'degreaser's flush'. Minimal anesthetic or irritant effects may be seen around 200-400 ppm trichloroethylene. Levels in the range of 1000-2000 ppm may rapidly cause dizziness and drunkenness. Progressively higher levels or longer exposure may cause unconsciousness and death and may be immediately hazardous to life.

Ingestion: Low toxicity if swallowed. Small amounts swallowed incidentally as a result of normal handling operations are not likely to cause injury; however, swallowing larger amounts may cause serious injury, even death. Aspiration into the lungs may occur during ingestion or vomiting, resulting in rapid absorption and injury to other body systems.

Effects of Repeated Exposure: In animals, effects have been reported on the following organs: Kidney. Liver. Central nervous system. Peripheral nervous system. Alcohol consumed before or after exposure may increase adverse effects. Trichloroethylene is reported to have caused hearing loss in laboratory animals upon repeated exposure to 2500 ppm or higher (orders of magnitude greater than the current occupational exposure standards). However, the relevance of this to humans is unknown.

Cancer Information: Tumors were observed in mice given large doses of trichloroethylene. Data suggest a nongenotoxic mechanism for tumor formation that implies that nontoxic doses of trichloroethylene should pose little or no carcinogenic hazard. A very low incidence of tumors has been observed in male rats at high levels of trichloroethylene which caused reduced survival, rendering these studies inadequate. Limited epidemiology data have shown a weak association between trichloroethylene exposure and renal cancer.

Birth Defects/Developmental Effects: Did not cause birth defects in laboratory animals. Has been toxic to the fetus in lab animals at doses toxic to the mother.

3. Composition Information

Component	CAS #	Amount

1,1,2-Trichloroethylene	79-01-6	99.9 %

4. First-aid measures

Eye Contact: Flush eyes thoroughly with water for several minutes. Remove contact lenses after the initial 1-2 minutes and continue flushing for several additional minutes. If effects occur, consult a physician, preferably an ophthalmologist.

Skin Contact: Wash skin with plenty of water.

Inhalation: Move person to fresh air. If not breathing, give artificial respiration; if by mouth to mouth use rescuer protection (pocket mask, etc). If breathing is difficult, oxygen should be administered by qualified personnel. Call a physician or transport to a medical facility.

Ingestion: Do not induce vomiting. Call a physician and/or transport to emergency facility immediately.

Notes to Physician: Because rapid absorption may occur through the lungs if aspirated and cause systemic effects, the decision of whether to induce vomiting or not should be made by a physician. If lavage is performed, suggest endotracheal and/or esophageal control. Danger from lung aspiration must be weighed against toxicity when considering emptying the stomach. Maintain adequate ventilation and oxygenation of the patient. Exposure may increase "myocardial irritability". Do not administer sympathomimetic drugs such as epinephrine unless absolutely necessary. Alcohol consumed before or after exposure may increase adverse effects. No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient.

Medical Conditions Aggravated by Exposure: Skin contact may aggravate preexisting dermatitis.

5. Fire Fighting Measures

Extinguishing Media: Water fog or fine spray. Dry chemical fire extinguishers. Carbon dioxide fire extinguishers. Foam. Water fog, applied gently may be used as a blanket for fire extinguishment.

Fire Fighting Procedures: Keep people away. Isolate fire and deny unnecessary entry. Stay upwind. Keep out of low areas where gases (fumes) can accumulate. Burning liquids may be moved by flushing with water to protect personnel and minimize property damage. Water fog, applied gently may be used as a blanket for fire extinguishment. Contain fire water run-off if possible. Fire water runoff, if not contained, may cause environmental damage. Review the "Accidental Release Measures" and the "Ecological Information" sections of this (M)SDS.

Special Protective Equipment for Firefighters: Wear positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing

(includes fire fighting helmet, coat, trousers, boots, and gloves). If protective equipment is not available or not used, fight fire from a protected location or safe distance.

Unusual Fire and Explosion Hazards: Container may vent and/or rupture due to fire. Although this material does not have a flash point, it can burn at room temperature. Vapors are heavier than air and may travel a long distance and accumulate in low lying areas.

Hazardous Combustion Products: During a fire, smoke may contain the original material in addition to combustion products of varying composition which may be toxic and/or irritating. Combustion products may include and are not limited to: Hydrogen chloride. Carbon monoxide. Carbon dioxide. Combustion products may include trace amounts of: Phosgene. Chlorine.

6. Accidental Release Measures

Steps to be Taken if Material is Released or Spilled: Small spills: Contain spilled material if possible. Absorb with materials such as: Vermiculite. Bentonite. Sawdust. Collect in suitable and properly labeled containers. Large spills: Dike area to contain spill. Pump into suitable and properly labeled containers. Suitable containers include: Metal drums. See Section 13, Disposal Considerations, for additional information.

Personal Precautions: Evacuate area. Keep personnel out of low areas. Keep personnel out of confined or poorly ventilated areas. Keep upwind of spill. Ventilate area of leak or spill. Only trained and properly protected personnel must be involved in clean-up operations. Confined space entry procedures must be followed before entering the area. Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection. Refer to Section 7, Handling, for additional precautionary measures.

Environmental Precautions: Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information.

7. Handling and Storage

Handling
General Handling: Handling in closed systems is recommended. Avoid breathing vapor. Do not swallow. Avoid contact with eyes, skin, and clothing. Wash thoroughly after handling. Keep container closed. Use with adequate ventilation. Containers, even those that have been emptied, can contain vapors. Do not cut, drill, grind, weld, or perform similar operations on or near empty containers. Do not enter confined spaces unless adequately ventilated. To avoid uncontrolled emissions, vent vapor from container to storage tank. Vapors of this product are heavier than air and lethal concentrations of vapors can collect in low, confined and unventilated spaces such as tanks, pits, small rooms and even in equipment (degreasers) that is used for degreasing metal parts. Do not enter these confined spaces where vapors of this product are suspected unless special breathing apparatus is

Annotation:
used and an observer is present for assistance. When using do not eat, drink or smoke. See Section 8, EXPOSURE CONTROLS AND PERSONAL PROTECTION.

Other Precautions: When appropriate, unique handling information for containers can be found on the product label.

Storage
Store in a cool, dry place. Store away from direct sunlight. Do not store in: Zinc. Aluminum. Aluminum alloys. Plastic. Product should not be packaged in aluminum aerosol cans or with finely divided aluminum or its alloys in an aerosol can.

8. Exposure Controls / Personal Protection

Exposure Limits

Component	List	Type	Value
1,1,2-Trichioroethylene	ACGIH	TWA	52 mg/m3 10 ppm
	ACGIH	STEL	135 mg/m3 25 ppm
	OSHA/Z2	TWA	100 ppm
	OSHA/Z2	Ceiling	200 ppm
	OSHA/Z2	MAX CONC	300 ppm 5 minutes in any 2 hours
	Dow IHG	TWA	5 ppm

Personal Protection

Eye/Face Protection: Use chemical goggles. If exposure causes eye discomfort, use a full-face respirator.

Skin Protection: Use protective clothing chemically resistant to this material. Selection of specific items such as face shield, boots, apron, or full body suit will depend on the task. Remove contaminated clothing immediately, wash skin area with soap and water, and launder clothing before reuse or dispose of properly.

Hand protection: Use gloves chemically resistant to this material. Examples of preferred glove barrier materials include: Viton. Polyvinyl alcohol ("PVA"). Ethyl vinyl alcohol laminate ("EVAL"). Examples of acceptable glove barrier materials include: Butyl rubber. Neoprene. Nitrile/butadiene rubber ("nitrile" or "NBR"). Avoid gloves made of: Polyvinyl chloride ("PVC" or "vinyl"). NOTICE: The selection of a specific glove for a particular application and duration of use in a workplace should also take into account all relevant workplace factors such as, but not limited to: Other chemicals which may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), potential body reactions to glove materials, as well as the instructions/specifications provided by the glove supplier.

Respiratory Protection: Atmospheric levels should be maintained below the exposure guideline. When respiratory protection is required, use an approved air-purifying or positive-pressure supplied-air respirator depending on the potential airborne concentration. For emergency and other conditions where

Annotation:
the exposure guideline may be exceeded, use an approved positive-pressure self-contained breathing apparatus or positive-pressure air line with auxiliary self-contained air supply. In confined or poorly ventilated areas, use an approved self-contained breathing apparatus or positive pressure air line with auxiliary self-contained air supply. The following should be effective types of air-purifying respirators: Organic vapor cartridge.

Ingestion: Avoid ingestion of even very small amounts; do not consume or store food or tobacco in the work area; wash hands and face before smoking or eating.

Engineering Controls
Ventilation: Provide general and/or local exhaust ventilation to control airborne levels below the exposure guidelines. Lethal concentrations may exist in areas with poor ventilation.

9. Physical and Chemical Properties

Physical State	Liquid
Color	Colorless
Odor	Characteristic
Flash Point - Closed Cup	Tag Closed Cup ASTM D56 (none)
Flammable Limits In Air	Lower: 8.0 %(V) Literature
	Upper: 44.8 %(V) Literature
Autoignition Temperature	420 C (788 F) Literature
Vapor Pressure	7.233 kPa @ 20 C Literature
	54.25 mmHg @ 20 C Literature
Boiling Point (760 mmHg)	87 C (189 F) Literature .
Vapor Density (air = 1)	4.5 Literature
Specific Gravity (H2O=1)	1.46 25 C/25 C Literature
Freezing Point	-87 C (-125 F) Literature
Melting Point	Not applicable
Solubility in Water (by weight)	0.1 % @ 25 C Literature
pH	Not applicable
Molecular Weight	131.4 g/mol Literature
Octanol/Water Partition	2.42 Measured Coefficient
Percent Volatiles	100 %(m) Literature
Kinematic Viscosity	0.391 cSt Calculated

10. Stability and Reactivity

Stability/Instability
Stable under recommended storage conditions. See Storage, Section 7.
Conditions to Avoid: Exposure to elevated temperatures can cause product to decompose. Avoid open flames, welding arcs, or other high temperature sources which induce thermal decomposition. Avoid direct sunlight or ultraviolet sources.

Incompatible Materials: Avoid contact with: Strong bases. Strong oxidizers. Reaction with strong alkali metal hydroxides will form dichloroacetylene

Annotation:
which can spontaneously ignite in air. Avoid contact with metals such as: Zinc powders. Aluminum powders. Magnesium powders. Potassium. Sodium. Avoid prolonged contact with or storage in aluminum or its alloys. Avoid unintended contact with: Amines.

Hazardous Polymerization
Will not occur.

Thermal Decomposition
Decomposition products depend upon temperature, air supply and the presence of other materials. Decomposition products can include and are not limited to: Hydrogen chloride. Decomposition products can include trace amounts of: Chlorine. Phosgene.

11. Toxicological Information

Acute Toxicity

Ingestion
LD50, Rat 4,920 mg/kg

Skin Absorption
Approximate. LD50, Rabbit 10,000 mg/kg

Inhalation
LC50, 4 h, Vapor, Rat 12,500 ppm

Repeated Dose Toxicity
In animals, effects have been reported on the following organs: Kidney. Liver. Central nervous system. Peripheral nervous system. Alcohol consumed before or after exposure may increase adverse effects. Trichloroethylene is reported to have caused hearing loss in laboratory animals upon repeated exposure to 2500 ppm or higher (orders of magnitude greater than the current occupational exposure standards). However, the relevance of this to humans is unknown.

Chronic Toxicity and Carcinogenicity
Tumors were observed in mice given large doses of trichloroethylene. Data suggest a nongenotoxic mechanism for tumor formation that implies that nontoxic doses of trichloroethylene should pose little or no carcinogenic hazard. A very low incidence of tumors has been observed in male rats at high levels of trichloroethylene which caused reduced survival, rendering these studies inadequate. Limited epidemiology data have shown a weak association between trichloroethylene exposure and renal cancer.

Carcinogenicity Classifications:

Component	List	Classification
1,1,2-Trichloroethylene	ACGIH	Suspected carcinogen; Group A2
	NTP	Anticipated carcinogen.
	IARC	Probable carcinogen; 2A

Annotation:

Developmental Toxicity
Did not cause birth defects in laboratory animals. Has been toxic to the fetus in lab animals at doses toxic to the mother.

Reproductive Toxicity
In animal studies, did not interfere with reproduction.

Genetic Toxicology
The data presented are for the following material: Trichloroethylene. In vitro genetic toxicity studies were negative. Animal genetic toxicity studies were predominantly negative. Pure trichloroethylene (without additives) lacks genetic toxicity potential in most tests.

12. Ecological Information

CHEMICAL FATE

Movement & Partitioning
Bioconcentration potential is low (BCF less than 100 or log Pow less than 3).
Potential for mobility in soil is high (Koc between 50 and 150).
Henry's Law Constant (H): 1.03E-2 atm*m3/mole Measured
Partition coefficient, n-octanol/water (log Pow): 2.42 Measured
Partition coefficient, soil organic carbon/water (Koc): 41 - 150 Estimated
Bioconcentration Factor (BCF): 17 - 90; fish; Measured

Persistence and Degradability
Based on stringent OECD test guidelines, this material cannot be considered as readily biodegradable; however, these results do not necessarily mean that the material is not biodegradable under environmental conditions.
Biodegradation rate may increase in soil and/or water with acclimation.
Biodegradation may occur under both aerobic and anaerobic conditions (in the presence or absence of oxygen).

Indirect Photodegradation with OH Radicals

Rate Constant	Atmospheric Half-life	Method
8.05e-13 cm3/s	13 d	Estimated

OECD Biodegradation Tests:

Biodegradation	Exposure Time	Method
2.4 %	14 d	OECD 301C Test

Chemical Oxygen Demand: 0.19 mg/mg
Theoretical Oxygen Demand: 0.55 mg/mg

ECOTOXICITY
Material is moderately toxic to aquatic organisms on an acute basis (LC50/EC50 between 1 and 10 mg/L in most sensitive species tested).

Fish Acute & Prolonged Toxicity
LC50, fathead minnow (Pimephales promelas), 96 h: 41 - 67 mg/l
Aquatic Invertebrate Acute Toxicity

Annotation:
LC50, water flea Daphnia magna, 48 h: 2.2 - 100 mg/l
LC50, grass shrimp (Palaemonetes pugio), 96 h: 2 mg/l
Aquatic Plant Toxicity
EC50, algae, 24 h: 410 mg/l
Toxicity to Micro-organisms
EC50; activated sludge, respiration inhibition: 260 mg/l

13. Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER. All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator. VENDOR HAS 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 MSDS SECTION: Composition Information. FOR UNUSED & UNCONTAMINATED PRODUCT, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device.

DISPOSAL OF CONTACT WATER: Process water in contact with solvent and/or water separators of cleaning or distillation equipment should be treated as hazardous waste. Do not discharge water from water separators to drain.

14. Transport Information

DOT Non-Bulk
Proper Shipping Name: TRICHLOROETHYLENE
Hazard Class: 6.1 ID Number: UN1710 Packing Group: PG III

DOT Bulk
Proper Shipping Name: TRICHLOROETHYLENE
Hazard Class: 6.1 ID Number: UN1710 Packing Group: PG III

IMDG
Proper Shipping Name: TRICHLOROETHYLENE
Hazard Class: 6.1 ID Number: UN1710 Packing Group: PG III
EMS Number: F-A,S-A
Marine pollutant: No

ICAO/IATA
Proper Shipping Name: TRICHLOROETHYLENE
Hazard Class: 6.1 ID Number: UN1710 Packing Group: PG III
Cargo Packing Instruction: 612
Passenger Packing Instruction: 605

Additional Information
Reportable quantity: 100 lb - TRICHLOROETHYLENE

Annotation:
This information is not intended to convey all specific regulatory or Operational requirements/information relating to this product. Additional transportation system information can be obtained through an authorized sales or customer service representative. It is the responsibility of the transporting organization to follow all applicable laws, regulations and rules relating to the transportation of the material.

15. Regulatory Information

OSHA Hazard Communication Standard
This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Sections 311 and 312

Immediate (Acute) Health Hazard	Yes
Delayed (Chronic) Health Hazard	Yes
Fire Hazard	No
Reactive Hazard	No
Sudden Release of Pressure Hazard	No

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Section 313
This product contains the following substances which are subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and which are listed in 40 CFR 372.

Component	CAS #	Amount
1,1,2-Trichloroethylene	79-01-6	99.9%

Pennsylvania (Worker and Community Right-To-Know Act): Pennsylvania Hazardous Substances List and/or Pennsylvania Environmental Hazardous Substance List:
The following product components are cited in the Pennsylvania Hazardous Substance List and/or the Pennsylvania Environmental Substance List, and are present at levels which require reporting.

Component	CAS #	Amount
1,1,2-Trichloroethylene	79-01-6	99.9%

Pennsylvania (Worker and Community Right-To-Know Act): Pennsylvania Special Hazardous Substances List:
To the best of our knowledge, this product does not contain chemicals at levels which require reporting under this statute.

Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) Section 103
This product contains the following substances which are subject to CERCLA Section 103 reporting requirements and which are listed in 40 CFR 302.4.

Component	CAS #	Amount
1,1,2-Trichloroethylene	79-01-6	99.9%

California Proposition 65 (Safe Drinking Water and Toxic Enforcement Act of

Annotation:

1986) WARNING: This product contains a chemical(s) known to the State of California to cause cancer.

Component	CAS #	Amount
1,1, 2-Trichloroethylene	79-01-6	99.9%

US. Toxic Substances Control Act
All components of this product are on the TSCA Inventory or are exempt from TSCA Inventory requirements under 40 CFR 720.30

16. Other Information

Hazard Rating System

NFPA	Health	Fire	Reactivity
	2	1	0

Recommended Uses and Restrictions
Industrial solvent. Vendor does NOT recommend the use of this product in applications where: - soil or ground water contamination is likely (direct applications to the ground, sink drains, sewers, or septic tanks). - where over exposure is likely (small rooms or confined space, or where there would be inadequate ventilation). - where skin contact is likely (adhesive tape removal from skin or as hand cleaner to remove oils and greases). - where there is direct food contact. - where vapor concentrations would be in the flammable range. - where disposal of waste would pose an environmental or health risk. - where chemical reactivity poses a danger (contact with strong alkali, or in areas where welding is done).

Legend

N/A	Not available
W/W	Weight/Weight
OEL	Occupational Exposure Limit
STEL	Short Term Exposure Limit
TWA	Time Weighted Average
ACGIH	American Conference of Governmental Industrial Hygienists, Inc.
DOW IHG	Dow Industrial Hygiene Guideline
WEEL	Workplace Environmental Exposure Level
HAZ_DES	Hazard Designation
Action Level	A value set by OSHA that is lower than the PEL which will trigger the need for activities such as exposure monitoring and medical surveillance if exceeded.

Univar USA Inc Material Safety Data Sheet

For Additional Information contact MSDS Coordinator during business hours, Pacific time: (425) 889-3400

Notice

Univar USA Inc. (”Univar”) expressly disclaims all express or implied warranties of merchantability and fitness for a particular purpose, with respect to the product or information provided herein, and shall under no circumstances be liable for incidental or consequential damages.

Do not use ingredient information and/or ingredient percentages in this MSDS as a product specification. For product specification information refer to a product specification sheet and/or a certificate of analysis. These can be obtained from your local Univar sales office.

All information appearing herein is based upon data obtained from the manufacturer and/or recognized technical sources. While the information is believed to be accurate, Univar makes no representations as to its accuracy or sufficiency. Conditions of use are beyond Univar's control and therefore users are responsible to verify this data under their own operating conditions to determine whether the product is suitable for their particular purposes and they assume all risks of their use, handling, and disposal of the product, or from the publication or use of, or reliance upon, information contained herein.

This information relates only to the product designated herein, and does not relate to its use in combination with any other material or in any other process