

Safety Data Sheet Perchloroethylene Revision 3, Date 10 Feb 2016

1. IDENTIFICATION

Product Name Perchloroethylene

Other Names 1,1,2,2-Tetrachloroethylene; Ethene, Tetrachloro-; Ethylene tetrachloride; PCE; Tetrachloroethylene

Uses Manufacture of substance, Use of substance as intermediate, Use in cleaning agents, Distribution of substance,

Formulation & (re)packing of substances and mixtures, Heat transfer fluid.

Chemical Family No Data Available

Chemical Formula C2CI4

Chemical Name Perchloroethylene **Product Description** No Data Available

Contact Details of the Supplier of this Safety Data Sheet

Organisation	Location	Telephone
Redox Pty Ltd	2 Swettenham Road Minto NSW 2566 Australia	+61-2-97333000
Redox Pty Ltd	11 Mayo Road Wiri Auckland 2104 New Zealand	+64-9-2506222
Redox Inc.	3960 Paramount Boulevard Suite 107 Lakewood CA 90712 USA	+1-424-675-3200
Redox Chemicals Sdn Bhd	Level 2, No. 8, Jalan Sapir 33/7 Seksyen 33, Shah Alam Premier Industrial Park 40400 Shah Alam Sengalor, Malaysia	+60-3-5614-2111

Emergency Contact Details

For emergencies only; DO NOT contact these companies for general product advice.

Organisation	Location	Telephone
Poisons Information Centre	Westmead NSW	1800-251525 131126
Chemcall	Australia	1800-127406 +64-4-9179888
Chemcall	Malaysia	+64-4-9179888
Chemcall	New Zealand	0800-243622 +64-4-9179888
National Poisons Centre	New Zealand	0800-764766
CHEMTREC	USA & Canada	1-800-424-9300 CN723420 +1-703-527-3887

2. HAZARD IDENTIFICATION

Poisons Schedule (Aust)

Globally Harmonised System

Corporate Office Sydney Locked Bag 15 Minto NSW 2566 Australia 2 Swettenham Road Minto NSW 2566 Australia All Deliveries: 4 Holmes Road Minto NSW 2566 Australia E-mail

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Phone +61 2 9733 3000 +61 2 9733 3111 svdnev@redox.com www.redox.com 92 000 762 345

Adelaide Auckland Brisbane Melbourne Hawke's Bay Perth

Sydney

Kuala Lumpur

USA Los Angeles



Hazard Classification Hazardous according to the criteria of the Globally Harmonised System of Classification and Labelling of

Chemicals (GHS)

Hazard Categories Carcinogenicity - Category 2

Long-term Hazard To The Aquatic Environment - Category 2

Acute Toxicity (Oral) - Category 5

Acute Toxicity (Inhalation) - Category 4

Skin Corrosion/Irritation - Category 2

Serious Eye Damage/Irritation - Category 2A

Specific Target Organ Toxicity (Repeated Exposure) - Category 2

Pictograms







Signal Word Warning

Hazard Statements H303 May be harmful if swallowed.

H315 Causes skin irritation.

H319 Causes serious eye irritation.

H332 Harmful if inhaled.

H351 Suspected of causing cancer.

H373 May cause damage to organs through prolonged or repeated exposure.

H411 Toxic to aquatic life with long lasting effects.

Precautionary Statements Prevention P201 Obtain special instructions before use.

P202 Do not handle until all safety precautions have been read and understood.

P260 Do not breathe fume/gas/mist/vapours/spray.

P264 Wash ... thoroughly after handling.

P271 Use only outdoors or in a well-ventilated area.

P273 Avoid release to the environment.

P280 Wear protective gloves/protective clothing/eye protection/face protection.

Response **P302 + P352** IF ON SKIN: Wash with plenty of soap and water.

P304 + P340 IF INHALED: Remove victim to fresh air and keep at rest in a position

comfortable for breathing.

P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact

lenses, if present and easy to do. Continue rinsing.

P308 + P313 IF exposed or concerned: Get medical advice/ attention.

P332 + P313 If skin irritation occurs: Get medical advice/attention.

P337 + P313 If eye irritation persists: Get medical advice/attention.

P362 Take off contaminated clothing and wash before reuse.

P391 Collect spillage.P405 Store locked up.

Disposal P501 Dispose of contents/container in accordance with local / regional / national /

international regulations.

Environmental Protection Authority (New Zealand)

Hazardous Substances and New Organisms Amendment Act 2015

Storage

HSNO Classifications	Health Hazards	6.1E	Substances that are acutely toxic -May be harmful, Aspiration hazard
		6 2 4	Cubatanaga that are irritating to the alin

6.3A Substances that are irritating to the skin6.4A Substances that are irritating to the eye

	6.7A	Substances that are known or presumed human carcinogens
	6.9B	Substances that are harmful to human target organs or systems
Environmental Hazards	9.1A	Substances that are very ecotoxic in the aquatic environment
	9.3B	Substances that are ecotoxic to terrestrial vertebrates
	9.1B	Substances that are ecotoxic in the aquatic environment
	9.2C	Substances that are harmful in the soil environment

3. COMPOSITION/INFORMATION ON INGREDIENTS

Ingredients

Chemical Entity	Formula	CAS Number	Proportion
Tetrachloroethylene	No Data Available	127-18-4	100.0 %

4. FIRST AID MEASURES

Description of necessary measures according to routes of exposure

Swallowed General Information: Remove affected person from source of contamination. General first aid, rest, warmth and fresh

air. Place unconscious person on the side in the recovery position and ensure breathing can take place.

DO NOT INDUCE VOMITING! NEVER MAKE AN UNCONSCIOUS PERSON VOMIT OR DRINK FLUIDS! Get medical

attention immediately!

Make sure to remove any contact lenses from the eyes before rinsing. Promptly wash eyes with plenty of water while Eve

lifting the eye lids. Continue to rinse for at least 15 minutes. Get medical attention if any discomfort continues.

Skin Remove contaminated clothing immediately and wash skin with soap and water. Get medical attention if any

discomfort continues.

Inhaled Remove victim immediately from source of exposure. When breathing is difficult, properly trained personnel may

assist affected person by administering oxygen. Get medical attention if any discomfort continues. Perform artificial

respiration if breathing has stopped.

Advice to Doctor Treat symtomatically. Treatment of overexposure should be directed at the control of symptoms and the clinical

condition of the patient.

Medical Conditions Aggravated

by Exposure

No information available on medical conditions aggravated by exposure to this product.

5. FIRE FIGHTING MEASURES

General Measures Avoid breathing fire vapours. Keep run-off water out of sewers and water sources. Dike for water control. Keep

people away. Isolate fire and deny unecessary entry.

Flammability Conditions Product is a non-flammable liquid.

Extinguishing Media Use fire-extinguishing media appropriate for surrounding materials. Use water to keep fire exposed containers cool

and disperse vapours. Do not use water jet as an extinguisher, as this will spread the fire. Violent steam generation or

eruption may occur upon application of direct water stream to hot liquids.

Hazardous Products of

Combustion

Hydrogen chloride (HCI). Phosgene (COCI2).

Special Fire Fighting

Instructions

Clear fire area of all non-emergency personnel. Stay upwind. Keep out of low areas. Eliminate ignition sources. Move fire exposed containers from fire area if it can be done without risk. Do NOT allow fire fighting water to reach

waterways, drains or sewers. Store fire fighting water for treatment.

Fire fighters should wear a positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting **Personal Protective Equipment**

clothing (includes fire fighting helmet, coat, trousers, boots and gloves) or chemical splash suit.

Flash Point No Data Available Lower Explosion LimitNo Data AvailableUpper Explosion LimitNo Data AvailableAuto Ignition TemperatureNo Data Available

Hazchem Code 2Z

6. ACCIDENTAL RELEASE MEASURES

General Response Procedure Avoid accidents, clean up immediately. Slippery when spilt. Personnel involved in the clean up should wear full

protective clothing as listed in section 8. Eliminate all sources of ignition. Increase ventilation. Use clean, non-sparking

tools and equipment.

Clean Up Procedures Soak up spilled product using absorbent non-combustible material such as sand or soil. Avoid using sawdust or

cellulose. When saturated, collect the material and transfer to a suitable, labelled chemical waste container and

dispose of promptly as hazardous waste.

Containment Stop leak if safe to do so.

Environmental Precautionary

Measures

Do not allow product to reach drains, sewers or waterways. If product does enter a waterway, advise the

Environmental Protection Authority or your local Waste Authority.

Evacuation Criteria Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering.

Personal Precautionary

Measures

Do NOT touch damaged containers or spilled material unless wearing appropriate protective clothing as listed in

section 8.

7. HANDLING AND STORAGE

Handling Do not use in confined spaces without adequate ventilation and/or respirator. Avoid inhalation of vapours/spray and

contact with skin and eyes. Do not swallow Container must be kept tightly closed. Provide good ventilation. Good personal hygiene is necessary. Wash hands and contaminated areas with water and soap before leaving the work

site.

Storage Store in a cool, dry, well-ventilated area. Keep containers tightly closed when not in use. Inspect regularly for

deficiencies such as damage or leaks. Protect against physical damage. Store away from incompatible materials as listed in section 10. Keep away from heat, sparks and open flame. Keep out of direct sunlight. This product has a UN classification of 1897 and a Dangerous Goods Class 6.1 (Toxic) according to The Australian Code for the Transport

of Dangerous Goods By Road and Rail.

Container Container type/packaging must comply with all applicable local legislation. Store in original packaging as approved by

manufacturer.

Unsuitable containers: aluminium.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

General The following exposure standard has been established by The Australian Safety and Compensation Council (ASCC);

Tetrachloroethylene CAS 127-18-4:

TWA = 50ppm (340mg/m3) STEL = 150ppm (1020mg/m3)

NOTE: The exposure value at the TWA is the average airborne concentration of a particular substance when

calculated over a normal 8 hour working day for a 5 day working week.

These exposure standards are guides to be used in the control of occupational health hazards. All atmospheric contamination should be kept to as low a level as is workable. These exposure standards should not be used as fine dividing lines between safe and dangerous concentrations of chemicals. They are not a measure of relative toxicity.

preventing dispersion of it into the general work area. Adequate ventilation should be provided so that exposure limits

Exposure Limits No Data Available

Biological Limits No information available on biological limit values for this product.

Engineering Measures

A system of local and/or general exhaust is recommended to keep employee exposures as low as possible. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source,

are not exceeded.

Personal Protection Equipment RESPIRATOR: If ventilation is insufficient, suitable respiratory protection must be provided. Chemical respirator with

organic vapour cartridge (AS1715/1716).

EYES: Wear approved safety goggles (AS1336/1337).

HANDS: The most suitable glove must be chosen in consultation with the gloves supplier, who can inform about the breakthrough time of the glove material. When prolonged or repeated contact may occur, a glove with a protection class of 5 or higher (breakthrough time greater than 240 minutes) is recommended (AS2161).

CLOTHING: Chemical-resistant coveralls, an apron and safety footwear (AS3765/2210).

Work Hygienic Practices

Wash at the end of each work shift and before eating, smoking and using the toilet. Wash promptly with soap &

water if skin becomes contaminated. DO NOT SMOKE IN WORK AREA!

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State Liquid **Appearance** Liauid

Odour Chlorinated hydrocarbons.

Colour Colourless

рΗ No Data Available **Vapour Pressure** 2.5 kPa (@ 25 °C) **Relative Vapour Density** $5.8 \, Air = 1$

Boiling Point 121 °C 760 mmHg **Melting Point** No Data Available

Freezing Point -22 °C

Solubility 0.015 g/100g Water 20°C

1.619 **Specific Gravity**

Flash Point No Data Available **Auto Ignition Temp** No Data Available **Evaporation Rate** No Data Available **Bulk Density** 1631 Kg/m3 **Corrosion Rate** No Data Available **Decomposition Temperature** No Data Available Density No Data Available **Specific Heat** No Data Available

Net Propellant Weight No Data Available **Octanol Water Coefficient** No Data Available **Particle Size** No Data Available

Partition Coefficient 2.53

Saturated Vapour Concentration No Data Available Vapour Temperature No Data Available 0.52 cSt (@ 25 °C) Viscosity **Volatile Percent** No Data Available **VOC Volume** No Data Available

Additional Characteristics Solubility: Slightly soluble in water. Soluble in: Organic solvents.

Volatility Description: Volatile. Critical Temperature (deg C): 347

Potential for Dust Explosion Product is a liquid. **Fast or Intensely Burning** No Data Available

Characteristics

Molecular Weight

No Data Available

166 g/mol

Flame Propagation or Burning **Rate of Solid Materials** Non-Flammables That Could

No Data Available

Contribute Unusual Hazards to a

No Data Available

Properties That May Initiate or Contribute to Fire Intensity

Reactions That Release Gases

or Vapours

No Data Available

Release of Invisible Flammable Vapours and Gases

No Data Available

10. STABILITY AND REACTIVITY

Chemical Stability Stable under normal temperature conditions and recommended use.

Conditions to Avoid Avoid heat, flames and other sources of ignition. Avoid exposure to high temperatures or direct sunlight.

Materials to Avoid Strong oxidising substances. Strong reducing agents. Avoid contact with metals such as: zinc powders, aluminium

powders, magnesium powders, potassium, sodium Amines.

Hazardous Decomposition

Products

Hydrogen chloride (HCI). Phosgene (COCI2).

Hazardous Polymerisation

No specific reactivity hazards associated with this product.

Will not polymerise.

11. TOXICOLOGICAL INFORMATION

General Information Oral LD50 Rat: >3000 mg/Kg

Dermal LD50 Rabbits: >10000 mg/Kg

Inhalation LC50 Rats/4hr: >20 mg/L - There is no evidence that the material can lead to respiratory hypersensitivity.

Has demonstrated the potential for contact allergy in mice

Negative. Negative.

This substance has been shown to increase the incidence of tumors in certain strains of mice and rats. Other long-term inhalation studies in rats failed to show tumorigenic response. Human data are limited and have not established an association between exposure and cancer. Has been toxic to the fetus in laboratory animals at doses toxic to the mother. Did not cause birth defects in laboratory animals. In humans, effects have been reported on the following organs: central nervous system. In animals, effects have been reported on the following organs: central nervous system, kidney, liver. Observations in animals include anesthetic or narcotic effects. Based on physical properties, not likely to be an aspiration hazard.

General Information:

Known or suspected carcinogen for humans.

Health Warnings:

Anaesthetic in high concentrations.

Route of entry: Ingestion. Inhalation.

Eyelrritant May cause temporary eye irritation.

Ingestion Gastrointestinal symptoms, including upset stomach. Nausea, vomiting. Central nervous system depression.

Inhalation Can cause central nervous system (CNS) depression. May cause drowsiness or dizziness; nausea or vomiting;

headache; unconsciousness.

SkinIrritant Irritating to skin. May cause sensitisation by skin contact. Skin irritation. Mild dermatitis, allergic skin rash.

Carcinogen Category 3

12. ECOLOGICAL INFORMATION

Ecotoxicity Fish (Onchorhynchus mykiss (Rainbow trout)) LC50/96hr: 5mg/L

Aquatic Invertebrates (Daphnia magna) EC50/48hr: 8.5mg/L Aquatic Plants (Chlamydomonas reinhardtii) EC50/72hr: 3.64mg/L

Microorganisms (Nitrosomonas) EC50/24hr: 112mg/L

Not Classified as PBT/vPvB by current EU criteria.

Persistence/Degradability The product is not readily biodegradable.

Mobility Adsorption/Desorption: Soil Koc ~ 141

Coefficient

Henry's Law Constant 2.11 Pa m3/mol

Environmental Fate Do NOT let product reach waterways, drains and sewers.

Bioaccumulation Potential Bioconcentration potential is low.

Bioaccumulation Factor: BCF 49 Lepomis macrochirus (Bluegill)

Partition Coefficient 2.53

Environmental Impact No Data Available

13. DISPOSAL CONSIDERATIONS

General Information Dispose of in accordance with all local, state and federal regulations. All empty packaging should be disposed of in

accordance with Local, State, and Federal Regulations or recycled/reconditioned at an approved facility.

Special Precautions for Land Fill Contact a specialist disposal company or the local waste regulator for advice.

14. TRANSPORT INFORMATION

Land Transport (Australia)

ADG Code

Proper Shipping Name TETRACHLOROETHYLENE

Class 6.1 Toxic and Infectious Substances - Toxic Substances

Subsidiary Risk(s) No Data Available

EPG 37 Toxic And/Or Corrosive Substances Non-Combustible

 UN Number
 1897

 Hazchem
 2Z

 Pack Group
 III

Special Provision No Data Available

Land Transport (Malaysia)

ADR

Proper Shipping Name TETRACHLOROETHYLENE

Class 6.1 Toxic and Infectious Substances - Toxic Substances

Subsidiary Risk(s) No Data Available

EPG 37 Toxic And/Or Corrosive Substances Non-Combustible

 UN Number
 1897

 Hazchem
 2Z

 Pack Group
 III

Special Provision No Data Available

Land Transport (New Zealand)

NZS5433

Proper Shipping Name TETRACHLOROETHYLENE

Class 6.1 Toxic and Infectious Substances - Toxic Substances

Subsidiary Risk(s) No Data Available

EPG 37 Toxic And/Or Corrosive Substances Non-Combustible

 UN Number
 1897

 Hazchem
 2Z

 Pack Group
 III

Special Provision No Data Available

Land Transport (United States of America)

US DOT

Proper Shipping Name TETRACHLOROETHYLENE

Class 6.1 Toxic and Infectious Substances - Toxic Substances

Subsidiary Risk(s) No Data Available

ERG 160 Halogenated Solvents

 UN Number
 1897

 Hazchem
 2Z

 Pack Group
 III

Special Provision No Data Available

Sea Transport

IMDG Code

Proper Shipping Name TETRACHLOROETHYLENE

Class 6.1 Toxic and Infectious Substances - Toxic Substances

Subsidiary Risk(s) No Data Available

 UN Number
 1897

 Hazchem
 2Z

 Pack Group
 III

Special Provision No Data Available

EMS FA,SA Marine Pollutant Yes

Air Transport

IATA DGR

Proper Shipping Name TETRACHLOROETHYLENE

Class 6.1 Toxic and Infectious Substances - Toxic Substances

Subsidiary Risk(s) No Data Available

 UN Number
 1897

 Hazchem
 2Z

 Pack Group
 III

Special Provision No Data Available

15. REGULATORY INFORMATION

General Information No Data Available

Poisons Schedule (Aust) 6

Environmental Protection Authority (New Zealand)

Hazardous Substances and New Organisms Amendment Act 2015

Approval Code HSR001551

National/Regional Inventories

Australia (AICS) Listed

Canada (DSL) Listed

Canada (NDSL) Not Determined

China (IECSC) Listed

Europe (EINECS) 204-825-9

Europe (REACh) Not Determined

Japan (ENCS/METI) Listed

Korea (KECI) Listed

Malaysia (EHS Register) Listed

New Zealand (NZIoC) Listed

Philippines (PICCS) Listed

Switzerland (Giftliste 1) Not Determined

Switzerland (Inventory of Notified

Substances)

Not Determined

Taiwan (NCSR) Listed

USA (TSCA) Listed

16. OTHER INFORMATION

Related Product Codes PECHLO0200, PECHLO0400, PECHLO0500, PECHLO0600, PECHLO0700, PECHLO0800, PECHLO0900,

PECHLO0901, PECHLO1002, PECHLO1000, PECHLO1001, PECHLO1002, PECHLO1003, PECHLO1004, PECHLO1005, PECHLO1006, PECHLO1007, PECHLO1008, PECHLO1009, PECHLO1010, PECHLO1011, PECHLO1012, PECHLO1013, PECHLO1014, PECHLO1015, PECHLO1016, PECHLO1017, PECHLO1018, PECHLO1019, PECHLO1020, PECHLO1021, PECHLO1022, PECHLO1023, PECHLO1100, PECHLO1101, PECHLO1102, PECHLO1103, PECHLO1100, PECHLO1500, PECHLO1500, PECHLO1500, PECHLO1500, PECHLO1500, PECHLO1500, PECHLO1701, PECHLO1701, PECHLO1705, PECHLO1707, PECHLO1800, PECHLO1801, PECHLO1802, PECHLO1803, PECHLO1804, PECHLO1805, PECHLO1805, PECHLO1807, PECHLO1807, PECHLO1807, PECHLO1807, PECHLO1807, PECHLO18181, PECHLO18181, PECHLO1811, PECHLO1811, PECHLO1811, PECHLO1811, PECHLO1812, PECHLO18123, PECHLO1824, PECHLO1825, PECHLO1800, PECHLO1801, PECHLO18020, PECHLO2002, PECHLO2002, PECHLO2100, PECHLO2001, PECHLO2002, PECHLO2100, PECHLO2001, PECHLO3001, PE

PECHLO6000, PECHLO7700, PECHLO8000, PECHLO9000, PECHLO9001

Revision 3

Revision Date 10 Feb 2016

Key/Legend < Less Than
> Greater Than

AICS Australian Inventory of Chemical Substances

atm Atmosphere

CAS Chemical Abstracts Service (Registry Number)

cm² Square CentimetresCO2 Carbon DioxideCOD Chemical Oxygen Demand

deg C (°C) Degrees Celcius EPA (New Zealand) Environmental Protection Authority of New Zealand

deg F (°F) Degrees Farenheit

g Grams

g/cm³ Grams per Cubic Centimetre

g/I Grams per Litre

HSNO Hazardous Substance and New Organism

IDLH Immediately Dangerous to Life and Health

immiscible Liquids are insoluable in each other.

inHg Inch of Mercury

inH2O Inch of Water

K Kelvin

kg Kilogram

kg/m³ Kilograms per Cubic Metre

Ib Pound

LC50 LC stands for lethal concentration. LC50 is the concentration of a material in air which causes the death of 50% (one half) of a group of test animals. The material is inhaled over a set period of time, usually 1 or 4 hours. **LD50** LD stands for Lethal Dose. LD50 is the amount of a material, given all at once, which causes the death of 50% (one half) of a group of test animals.

Itr or L Litre

m³ Cubic Metre

mbar Millibar

mg Milligram

mg/24H Milligrams per 24 Hours

mg/kg Milligrams per Kilogram

mg/m³ Milligrams per Cubic Metre

Misc or **Miscible** Liquids form one homogeneous liquid phase regardless of the amount of either component present.

mm Millimetre

mmH2O Millimetres of Water

mPa.s Millipascals per Second

N/A Not Applicable

NIOSH National Institute for Occupational Safety and Health

NOHSC National Occupational Heath and Safety Commission

OECD Organisation for Economic Co-operation and Development

Oz Ounce

PEL Permissible Exposure Limit

Pa Pascal

ppb Parts per Billion

ppm Parts per Million

ppm/2h Parts per Million per 2 Hours

ppm/6h Parts per Million per 6 Hours

psi Pounds per Square Inch

R Rankine

RCP Reciprocal Calculation Procedure

STEL Short Term Exposure Limit

TLV Threshold Limit Value

tne Tonne

TWA Time Weighted Average

ug/24H Micrograms per 24 Hours

UN United Nations

wt Weight