

Safety Data Sheet

1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

Product Name: PERCHLOROETHYLENE

Other name(s): Tetrachloroethylene; 1,1,2,2-Tetrachloroethylene; PCE; PERC; Perchloroethylene; Perclean; Perklone D.

Recommended Use: Drycleaning fluid, solvent.

Supplier: Orica New Zealand Limited
Street Address: Orica Chemnet House
Level four, 123 Carlton Gore Road
Newmarket, Auckland
New Zealand
Telephone Number: +64 9 368 2700
Facsimile: +64 9 368 2710
Emergency Telephone: 0 800 734 607 (ALL HOURS)

2. HAZARDS IDENTIFICATION

Classified as a Dangerous Good according to NZS 5433:1999 Transport of Dangerous Goods on Land.

Classified as hazardous according to criteria in the HS (Minimum Degrees of Hazard) Regulations 2001.

Subclasses: Subclass 6.1 Category E - Substances which are acutely toxic.
Subclass 6.3 Category A - Substances that are irritating to the skin.
Subclass 6.4 Category A - Substances that are irritating to the eye.
Subclass 6.7 Category A - Substances that are known or presumed human carcinogens.
Subclass 6.9 Category B - Substances that are harmful to human target organs or systems.
Subclass 9.1 Category A - Substances that are very ecotoxic in the aquatic environment.
Subclass 9.2 Category C - Substances that are harmful in the soil environment.
Subclass 9.3 Category B - Substances that are ecotoxic to terrestrial vertebrates.

The 'Hazardous Substances (Tracking) Regulations 2001' are applicable to this material.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Components / CAS Number	Proportion	Risk Phrases
Tetrachloroethylene 127-18-4	>99%	Carc. Cat. 3 R40, R51/53

4. FIRST AID MEASURES

For advice, contact a Poisons Information Centre (Phone eg. Australia 131 126; New Zealand 0 800 764766) or a doctor at once.

Product Name: PERCHLOROETHYLENE
Substance No: 000031016301

Issued: 04/11/2005
Version: 2

Safety Data Sheet

Inhalation:	Remove victim from area of exposure - avoid becoming a casualty. Remove contaminated clothing and loosen remaining clothing. Allow patient to assume most comfortable position and keep warm. Keep at rest until fully recovered. If patient finds breathing difficult and develops a bluish discoloration of the skin (which suggests a lack of oxygen in the blood - cyanosis), ensure airways are clear of any obstruction and have a qualified person give oxygen through a face mask. Apply artificial respiration if patient is not breathing. Seek immediate medical advice.
Skin Contact:	If skin contact occurs, remove contaminated clothing and wash skin with running water. If irritation occurs seek medical advice.
Eye Contact:	If in eyes, hold eyelids apart and flush the eye continuously with running water. Continue flushing until advised to stop by the Poisons Information Centre or a doctor, or for at least 15 minutes.
Ingestion:	Rinse mouth with water. If swallowed, do NOT induce vomiting. Give a glass of water. Seek immediate medical assistance.
Medical attention and special treatment:	Treat symptomatically. As for exposure to chlorinated solvents. Adrenaline and similar sympathomimetic drugs should be avoided following exposure to tetrachloroethylene. Complications may include cardiac arrhythmia and cardiac arrest. Gastric lavage may be effective and should preferably be undertaken within one hour. Aspiration of this material into the lungs must be avoided. Following ingestion, adsorbents such as activated charcoal may be useful.

5. FIRE FIGHTING MEASURES

Hazards from combustion products: Non-combustible material.

Precautions for fire fighters and special protective equipment: Decomposes on heating emitting toxic fumes, including those of phosgene, hydrogen chloride and oxides of carbon. Fire fighters to wear self-contained breathing apparatus and suitable protective clothing if risk of exposure to products of decomposition. Heating can cause expansion or decomposition of the material, which can lead to the containers exploding. If safe to do so, remove containers from the path of fire. Welding or cutting should not be carried out on any vessel likely to contain solvent.

Hazchem Code: 2[Z]

6. ACCIDENTAL RELEASE MEASURES

Emergency procedures: Isolate spill or leak area immediately. Clear area of all unprotected personnel. If contamination of sewers or waterways has occurred advise local emergency services.

Methods and materials for: Slippery when spilt. Avoid accidents, clean up immediately. Wear protective equipment

Product Name: PERCHLOROETHYLENE
Substance No: 000031016301

Issued: 04/11/2005 **Version:** 2

Safety Data Sheet

containment and clean up: to prevent skin and eye contact and breathing in vapours. Work up wind or increase ventilation. Contain - prevent run off into drains and waterways. Use absorbent (soil, sand or other inert material). Collect and seal in properly labelled containers or drums for disposal.

7. HANDLING AND STORAGE

Precautions for safe handling: Avoid skin and eye contact and breathing in vapour, mists and aerosols.

Conditions for safe storage: Store in a cool, dry, well ventilated place and out of direct sunlight. Store away from incompatible materials described in Section 10. Store away from foodstuffs. Keep containers closed when not in use - check regularly for spills. Containers should be of mild steel, or amber or dark green solvent resistant plastic glass. Bulk storage vessels should be made of steel and require suitable vent or pressure relief valve. Storage tanks should be bunded to accomodate 110% of the tank volume.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Perchloroethylene: WES-TWA 50 ppm, 335 mg/m³; WES-STEL 150 ppm, 1005 mg/m³, A3 Carcinogen

WES - TWA (Workplace Exposure Standard - Time Weighted Average) - The eight-hour, time-weighted average exposure standard is designed to protect the worker from the effects of long-term exposure.

WES - STEL (Workplace Exposure Standard - Short Term Exposure Limits) - The 15 minute average exposure standard. Applies to any 15 minute period in the working day and is designed to protect the worker against adverse effects of irritation, chronic or irreversible tissue change, or narcosis that may increase the likelihood of accidents. The WES-STEL is not an alternative to the WES-TWA; both short-term and eight-hour, time-weighted average exposures should be determined.

Carcinogen Category A3 - Confirmed animal carcinogen with unknown relevance to humans.

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.

Engineering controls:

Ensure ventilation is adequate to maintain air concentrations below Exposure Standards. Use with local exhaust ventilation or while wearing organic vapour respirator or air supplied mask. Vapour heavier than air - prevent concentration in hollows or sumps. DO NOT enter confined spaces where vapour may have collected. Do not weld in the presence of vapours as toxic decomposition products may be formed. Keep containers closed when not in use.

Personal Protective Equipment:

The selection of PPE is dependant on a detailed risk assessment. The risk assessment should consider the work situation, the physical form of the chemical, the handling methods, and environmental factors.

Product Name: PERCHLOROETHYLENE
Substance No: 000031016301

Issued: 04/11/2005

Version: 2

Safety Data Sheet

Orica Personal Protection Guide No. 1, 1998: G - OVERALLS, SAFETY SHOES, SAFETY GLASSES, GLOVES, RESPIRATOR.

Wear overalls, safety glasses and impervious gloves. Use with adequate ventilation. If inhalation risk exists wear organic vapour respirator meeting the requirements of AS/NZS 1715 and AS/NZS 1716. Available information suggests that gloves made from the following material(s) should be suitable for intermittent contact, however, due to variations in glove construction and local conditions, a final assessment should be made by the user: poly vinyl alcohol. Always wash hands before smoking, eating, drinking or using the toilet. Wash contaminated clothing and other protective equipment before storage or re-use.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state:	Clear Liquid
Colour:	Colourless
Odour:	Characteristic Ethereal
Molecular Formula:	C ₂ Cl ₄
Solubility:	Marginally soluble in water. Soluble in most organic solvents.
Specific Gravity:	1.623 @20°C
Relative Vapour Density (air=1):	5.83 @74°C
Vapour Pressure (20 °C):	2 kPa
Flash Point (°C):	Not applicable
Flammability Limits (%):	Not applicable
Autoignition Temperature (°C):	Not applicable
% Volatile by Volume:	100
Melting Point/Range (°C):	-22.4
Boiling Point/Range (°C):	121
pH:	Not available

10. STABILITY AND REACTIVITY

Chemical stability:	Stable under normal conditions.
Conditions to avoid:	Avoid exposure to heat, sources of ignition, and open flame.
Incompatible materials:	Incompatible with finely powdered metals .
Hazardous decomposition products:	Phosgene. Hydrogen chloride. Oxides of carbon.
Hazardous reactions:	May react violently with metals such as sodium, potassium and barium, particularly if they are finely divided. May react with freshly galvanised surfaces to produce highly toxic dichloroacetylene. Contact with hot surfaces, sparks or naked flames may generate toxic fumes of phosgene and hydrogen chloride.

11. TOXICOLOGICAL INFORMATION

Product Name: PERCHLOROETHYLENE
Substance No: 000031016301

Issued: 04/11/2005 **Version:** 2

Safety Data Sheet

No adverse health effects expected if the product is handled in accordance with this Safety Data Sheet and the product label. Symptoms or effects that may arise if the product is mishandled and overexposure occurs are:

Ingestion: Swallowing small splashes is unlikely to cause any adverse effects. Swallowing larger amounts can result in nausea, vomiting, irritation to the mouth, throat and stomach, and may lead to central nervous system depression. If the victim is showing signs of central system depression (like those of drunkenness) there is greater likelihood of the patient breathing in vomit and causing damage to the lungs.

Eye contact: May be an eye irritant.

Skin contact: Contact with skin may result in irritation. Will have a degreasing action on the skin. Repeated or prolonged skin contact may lead to irritant contact dermatitis.

Inhalation: Breathing in vapour can result in headaches, dizziness, drowsiness, and possible nausea. Breathing in high concentrations can produce central nervous system depression, which can lead to loss of co-ordination, impaired judgement and if exposure is prolonged, unconsciousness. Breathing in high concentrations may result in an irregular heart beat and prove suddenly fatal.

Long Term Effects:

Available evidence from animal studies indicate that repeated or prolonged exposure to this material could result in effects on the liver and kidneys. Some animal test data suggests a carcinogenic potential for this material. These particular data sets are not considered relevant to normal industrial use but do emphasise the need for care in handling.

Toxicological Data:

Oral LD50 (rat): 2,629 mg/kg.

Inhalation LC50 (mice): 5,200 ppm/4hr.

SKIN: Mild irritant (rabbit).

EYES: Mild irritant (rabbit).

Tetrachloroethylene: Inhalational Lowest Toxic Concentration (human): 96 ppm/7hr - effects on peripheral and central nervous system and eye irritation.

Human data:

50 ppm - odour threshold to unacclimatised persons.

600 ppm - dizziness and incoordination after 10 minutes

2,000 ppm - mild narcosis in 5 minutes.

Evidence from animal studies have shown this compound to cause liver and kidney damage at exposure levels well above the occupational exposure limit.

Studies in rats and mice at high doses indicate that tetrachloroethylene is an animal carcinogen. Evaluations of possible mechanisms have led to the conclusion that they are of little relevance to humans even at exposure levels well above the occupational exposure limit. Studies in workers have failed to demonstrate a relationship between exposure to tetrachloroethylene and cancer.

Product Name: PERCHLOROETHYLENE
Substance No: 000031016301

Issued: 04/11/2005

Version: 2

Safety Data Sheet

This material has been classified by the International Agency for Research on Cancer (IARC) as a Group 2A agent - The agent is probably carcinogenic to humans.

12. ECOLOGICAL INFORMATION

Ecotoxicity Avoid contaminating waterways.

Persistence/degradability and mobility

Highly volatile and insoluble liquid. Tetrachloroethylene evaporates rapidly from open water systems but persists in groundwater. It is degraded relatively rapidly in the lower atmosphere with a half life of approximately 5 months. It does not deplete ozone. The product is anticipated to be substantially removed in biological treatment processes. The product has no potential for bioaccumulation.

Aquatic toxicity:

Toxic to aquatic organisms. May cause long term adverse effects in the aquatic environment.

Log Octanol/Water Partition Coefficient: 2.53-2.88

96hr LC50 (fish): 6.8-21 mg/L.

Terrestrial toxicity: No information available.

13. DISPOSAL CONSIDERATIONS

Disposal methods: Refer to Waste Management Authority. Dispose of material through a licensed waste contractor. Residues must not be allowed to enter drains, sewers or watercourses or to contaminate the groundwater. Large volumes may be suitable for re-distillation by solvent recovery contractors.

14. TRANSPORT INFORMATION

Road and Rail Transport

Classified as a Dangerous Good according to NZS 5433:1999 Transport of Dangerous Goods on Land.

UN No: 1897
Class-primary 6.1 Toxic
Packing Group: III
Proper Shipping Name: TETRACHLOROETHYLENE
Hazchem Code: 2[Z]

Marine Transport

Classified as Dangerous Goods by the criteria of the International Maritime Dangerous Goods Code (IMDG Code) for transport by sea; DANGEROUS GOODS.

This material is classified as a Marine Pollutant (P) according to the International Maritime Dangerous Goods Code.

UN No: 1897

Product Name: PERCHLOROETHYLENE
Substance No: 000031016301

Issued: 04/11/2005 **Version:** 2

Safety Data Sheet

Class-primary: 6.1 Toxic
Packing Group: III
Proper Shipping Name: TETRACHLOROETHYLENE

Air Transport

Classified as Dangerous Goods by the criteria of the International Air Transport Association (IATA) Dangerous Goods Regulations for transport by air; DANGEROUS GOODS.

UN No: 1897
Class-primary: 6.1 Toxic
Packing Group: III
Proper Shipping Name: TETRACHLOROETHYLENE

15. REGULATORY INFORMATION

Classification: Classified as hazardous according to criteria in the HS (Minimum Degrees of Hazard) Regulations 2001.

Subclasses: Subclass 6.1 Category E - Substances which are acutely toxic.
Subclass 6.3 Category A - Substances that are irritating to the skin.
Subclass 6.4 Category A - Substances that are irritating to the eye.
Subclass 6.7 Category A - Substances that are known or presumed human carcinogens.
Subclass 6.9 Category B - Substances that are harmful to human target organs or systems.
Subclass 9.1 Category A - Substances that are very ecotoxic in the aquatic environment.
Subclass 9.2 Category C - Substances that are harmful in the soil environment.
Subclass 9.3 Category B - Substances that are ecotoxic to terrestrial vertebrates.

The 'Hazardous Substances (Tracking) Regulations 2001' are applicable to this material.

16. OTHER INFORMATION

Supplier Material Safety Data Sheet; 1997.
Canadian Centre for Occupational Health and Safety - Web Info Service. 2002.
In: 'Quick Selection Guide to Chemical Protective Clothing'. 3rd Edition. Eds. Forsberg, K. and Mansdon, S.Z. Van Nostrand Reinhold, New York, 1997.
In: 'Patty's Industrial Hygiene and Toxicology'. Vol. IIA/IIB/IIC/11D/11E/11F 4th Edition. Ed. Clayton, C.D. and Clayton, F.E.. John Wiley and Sons Inc., New York 1993.
In 'ECETOC Technical Report. (European Chemical Industry Ecology and Toxicology Centre, Belgium), 1990.
International Agency for Research on Cancer. In: 'IARC Monographs on the Evaluation of Carcinogenic Risk to Humans'. World Health Organisation, 1995.
In: 'Handbook of Environmental Data on Organic Chemicals'. 3rd Edition. Ed. Verschueren. Van Nostrand Reinhold Company, New York 1996.

Reason(s) for Issue:
Change in Hazardous Substance Classification

Product Name: PERCHLOROETHYLENE
Substance No: 000031016301

Issued: 04/11/2005 **Version:** 2

Safety Data Sheet

This MSDS summarises to our best knowledge at the date of issue, the chemical health and safety hazards of the material and general guidance on how to safely handle the material in the workplace. Since Orica Limited cannot anticipate or control the conditions under which the product may be used, each user must, prior to usage, assess and control the risks arising from its use of the material.

If clarification or further information is needed, the user should contact their Orica representative or Orica Limited at the contact details on page 1.

Orica Limited's responsibility for the material as sold is subject to the terms and conditions of sale, a copy of which is available upon request.

Product Name: PERCHLOROETHYLENE
Substance No: 000031016301

Issued: 04/11/2005

Version: 2