MATERIAL SAFETY DATA SHEET

PARADICHLOROBENZENE

Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

STATEMENT OF HAZARDOUS NATURE

Considered a Hazardous Substance according to the criteria of the New Zealand Hazardous Substances New Organisms legislation. ERMA Approval Code: HSR002955

SYNONYMS: 1,4-Dichlorobenzene; 4-Dichlorobenzene; Benzene, 1,4-dichloro-; Benzene, p-dichloro-; Dichloricide; Dichlorobenzene; EINECS 203-400-5; Evola; Globol; Para crystals; Paracide; Paradi; Paradichlorobenzene; Paradichlorobenzol; Paradow; Paramoth; Paranuggets; p-Chlorophenyl chloride; p-Dichlorobenzene; p-Dichlorobenzol; Persia-perazol; Santochlor; p-Dichlorobenzene

PROPER SHIPPING NAME: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (1,4-Dichlorobenzene)
CAS NUMBER: 106-46-7
UN NUMBER: 3077

PRODUCT USE: As an insecticidal fumigant, moth repellant for fabric and fur, germicide. Deodorant toilet blocks, urinal disinfectant. As a space odourant. In dyes, intermediates, pharmacy, agriculture (fumigating soil); In the manufacture of 2,5-dichloroaniline. Prior to 1993 Referred to as UN 1592 by Dangerous Goods Code.

SUPPLIER: **Interchem Agencies Limited**
7 Gladstone Road
Northcote
AUCKLAND 0627
NEW ZEALAND
Telephone: +64 9 418 0097
Fax: +64 9 418 4008

TRANSFER NOTICE: 28 June 2006
Hazardous Substances (Chemicals) Transfer Notice 2006 ,*New Zealand Gazette*, 28 June 2006 – Issue No.72 (http://www.ermanz.govt.nz/resources/publications/pdfs/gn72june06.pdf)

Substance Name: 1,4-Dichlorobenzene

Section 2 - HAZARDS IDENTIFICATION

HAZARD RATINGS

Flammability	0
Toxicity	4
Body Contact	4
Reactivity	2
Chronic	2

GHS Classification
Acute Aquatic Hazard Category 1
Acute Toxicity (Oral) Category 5
Carcinogen Category 2
Eye Irritation Category 2A
Organ Damage Category 2
Skin Corrosion/Irritation Category 2

HAZARD LABELLING

WARNING

EMERGENCY OVERVIEW

Gazetted by ERMANZ: 6.1E 6.3A 6.4A 6.7B 6.9B 9.1A
May be harmful if swallowed
Causes skin irritation
Causes serious eye irritation
Suspected of causing cancer
May cause damage to organs through prolonged or repeated exposure.
Very toxic to aquatic life

CONTROLS APPLYING TO THIS SUBSTANCE ARE:

1. Hazardous Substances (Classes 6,8 and 9 Controls) Regulations 2001
- T1 (R11-27), T2 (R29, 30), T4 (R7), T5 (R8), T7 (R10), T8 (R28), E1 (R32-45), E2 (R46-48), E5 (R5.2, 6), E6 (R7), E7 (R9)

2. Hazardous Substances (Packaging) Regulations 2001
- P1 (R5,6,7(1),8), P3 (R9), P13* (R19), P15 (R21), PG3 (Schedule 3)

3. Hazardous Substances (Disposal) Regulations 2001
- D4 (R8), D5 (R9), D6 (R10), D7 (R11, 12), D8 (13,14)

4. Hazardous Substances (Personnel Qualifications) Regulations 2001
- AH1 R(4-6)

5. Hazardous Substances (Tracking) Regulations 2001
- TR1 (R4.1,5,6)

6. Hazardous Substances (Emergency Management) Regulations 2001
- EM1 (R6,7,9-11), EM6 (R8e), EM7 (R8f), EM8 (R12-16, 18-20), EM11 (R25-34), EM12* (R35-41), EM13 (R42)

7. Hazardous Substances (Identification) Regulations 2001
- I1 (R6,7,32-35,36.1-36.7), I3 (R9), I8 (R14), I11 (R20), I12 (R21), I13 (R22)

8. Hazardous Substances (Tank Wagon and Transportable Containers) Regulations 2004.
9. Controls relating to secondary containment

Variation Codes applying to this substance are: 4, 11,19
For interpretation of variation codes see Gazette Notice 72 Schedule 2 Changes to Controls:
(http://www.ermanz.govt.nz/resources/publications/pdfs/gn72june06.pdf)

PRECAUTIONARY STATEMENTS

Wash thoroughly after handling.
Do not breathe dust/fume/gas/mist/vapours/spray.
Obtain special instructions before use.
Use personal protective equipment as required.
Do not handle until all safety precautions have been read and understood.
Avoid release to the environment.
Wash hands thoroughly after handling.

Response
If exposed or concerned: Get medical attention advice.
Wear eye/face protection.
Get medical advice/attention if you feel unwell.
If eye irritation persists, get medical advice/attention.
If skin irritation occurs, seek medical advice/attention.
IF ON SKIN: Gently wash with plenty of soap and water.
Wash/Decontaminate removed clothing before reuse.
Remove/Take off immediately all contaminated clothing
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
Storage
Store locked up.
Disposal
Dispose of contents and container in accordance with relevant legislation.

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

NAME	CAS RN	%	Hazardous
1,4-dichlorobenzene	106-46-7	>97	**Yes**

Section 4 - FIRST AID MEASURES

SWALLOWED
For advice, contact a Poisons Information Centre or a doctor.

EYE
If this product comes in contact with the eyes:
- Wash out immediately with fresh running water.
- Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.
- If pain persists or recurs seek medical attention.
- Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.

SKIN
If skin contact occurs:
- Immediately remove all contaminated clothing, including footwear
- Flush skin and hair with running water (and soap if available).
- Seek medical attention in event of irritation.

INHALED
- If fumes or combustion products are inhaled remove from contaminated area.
- Lay patient down. Keep warm and rested.
- Prostheses such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures.
- Apply artificial respiration if not breathing, preferably with a demand valve resuscitator, bag-valve mask device, or pocket mask as trained. Perform CPR if necessary.

Transport to hospital, or doctor

NOTES TO PHYSICIAN
Treat symptomatically.
EYES - Stain for evidence of corneal injury.
SKIN - Treat as for dermatitis.
RESPIRATION - Administer oxygen if available. The use of bronchodilators, expectorants and antitussives may help.
There is no antidote for systemic effects.

Section 5 - FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA
Water spray or fog.
Foam.
Dry chemical powder.
- **Alcohol stable foam.**

Carbon dioxide.

FIRE FIGHTING
- Alert Fire Brigade and tell them location and nature of hazard.
- Wear full body protective clothing with breathing apparatus.
- Prevent, by any means available, spillage from entering drains or water course.
- Use water delivered as a fine spray to control fire and cool adjacent area.
- Avoid spraying water onto liquid pools.
- DO NOT approach containers suspected to be hot.
- Cool fire exposed containers with water spray from a protected location.
- If safe to do so, remove containers from path of fire.

Equipment should be thoroughly decontaminated after use.

FIRE/EXPLOSION HAZARD
- Combustible.
- Slight fire hazard when exposed to heat or flame.
- Heat may cause expansion or decomposition leading to violent rupture of containers.
- On combustion, may emit toxic fumes of carbon monoxide (CO).
- May emit acrid smoke. May emit poisonous fumes.

Decomposes on heating and produces toxic fumes of: Hydrogen chloride, Chlorine, Carbon monoxide (CO), Phosgene and Carbon dioxide (CO2).

FIRE INCOMPATIBILITY
Avoid contamination with strong oxidising agents as ignition may result.
Avoid contact with aluminium powdered metals.

Personal Protective Equipment
Breathing apparatus.
Gas tight chemical resistant suit.
Limit exposure duration to 1 BA set30 mins.

Section 6 - ACCIDENTAL RELEASE MEASURES

MINOR SPILLS
- Remove all ignition sources.
- Clean up all spills immediately.
- Avoid contact with skin and eyes.
- Control personal contact by using protective equipment.
- Use dry clean up procedures and avoid generating dust.
- Place in a suitable labelled container for waste disposal.

MAJOR SPILLS

- Clear area of personnel and move upwind.
- Alert Fire Brigade and tell them location and nature of hazard.
- Wear full body protective clothing with breathing apparatus.
- Prevent, by any means available, spillage from entering drains or water courses.
- No smoking, naked lights or ignition sources.
- Stop leak if safe to do so.
- Water spray or fog may be used to disperse / absorb vapour.
- Contain spill with sand, earth or vermiculite.
- Collect recoverable product into labelled containers for recycling.
- Wash area with detergent and water and prevent runoff into drains.
- After clean up operations, decontaminate and launder all protective clothing and equipment before storing and re-using.
- If contamination of drains or waterways occurs, advise emergency services.

EMERGENCY RESPONSE PLANNING GUIDELINES (ERPG)

- The maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to one hour WITHOUT experiencing or developing life-threatening health effects is:
1,4-dichlorobenzene: 150ppm
- Irreversible or other serious effects or symptoms which could impair an individual's ability to take protective action is:
1,4-dichlorobenzene: 110ppm
- Other than mild, transient adverse effects without perceiving a clearly defined odor is:
1,4-dichlorobenzene: 110ppm
-The threshold concentration below which most people experience no appreciable risk of health effects:
1,4-dichlorobenzene: 75ppm

Personal Protective Equipment advice is contained in Section 8 of the MSDS

Section 7 - HANDLING AND STORAGE

PROCEDURE FOR HANDLING

- Avoid all personal contact, including inhalation.
- Wear protective clothing when risk of exposure occurs.
- Use in a well-ventilated area.
- Prevent concentration in hollows and sumps.
- DO NOT enter confined spaces until atmosphere has been checked.
- DO NOT allow material to contact humans, exposed food or food utensils.
- Avoid contact with incompatible materials.
- When handling, DO NOT eat, drink or smoke.
- Keep containers securely sealed when not in use.
- Avoid physical damage to containers.
- Always wash hands with soap and water after handling.
- Work clothes should be laundered separately. Launder contaminated clothing before re-use.
- Use good occupational work practice.
- Observe manufacturer's storing and handling recommendations.

Atmosphere should be regularly checked against established exposure standards to ensure safe working conditions are maintained.

SUITABLE CONTAINER

Glass container.
Metal can.
Steel drum.
DO NOT use aluminium or galvanised containers.

- Check that containers are clearly labelled

Packaging as recommended by manufacturer.

STORAGE INCOMPATIBILITY
Avoid storage with oxidisers.
DO NOT use aluminium or galvanised containers.

STORAGE REQUIREMENTS
- Store in original containers.
- Keep containers securely sealed.
- No smoking, naked lights or ignition sources.
- Store in a cool, dry, well-ventilated area.
- Store away from incompatible materials and foodstuff containers.
- Protect containers against physical damage and check regularly for leaks.

Observe manufacturer's storing and handling recommendations

Section 8 - EXPOSURE CONTROLS/PERSONAL PROTECTION

EXPOSURE CONTROLS

Source	Material	TWA ppm	TWA mg/m³	STEL ppm	STEL mg/m³	Peak ppm	Peak mg/m³	TWA F/CC
New Zealand Workplace Exposure Standards (WES)	1,4-dichlorobenzene (p-Dichlorobenzene)	25	153		50			

EMERGENCY EXPOSURE LIMITS

Material	Revised IDLH Value (mg/m3)	Revised IDLH Value (ppm)
1,4-dichlorobenzene		150

ODOUR SAFETY FACTOR (OSF)
OSF=56 (p-DICHLOROBENZENE)
Exposed individuals are reasonably expected to be warned, by smell, that the Exposure Standard is being exceeded.

MATERIAL DATA
Odour Threshold Value: 0.121 ppm (detection)
NOTE: Detector tubes for p-dichlorobenzene, measuring in excess of 2 ppm,
are commercially available.
Exposure at or below the limit is thought to protect workers from the significant risk of eye damage and irritation, vertigo and neuropathic effects

PERSONAL PROTECTIVE EQUIPMENT

EYE
- Safety glasses with side shields; or as required,
- Chemical goggles.
- DO NOT wear contact lenses.

HANDS/FEET
Wear chemical protective gloves, eg. PVC.
Wear safety footwear.

OTHER
- Overalls.
- Eyewash unit

ENGINEERING CONTROLS
If risk of inhalation or overexposure exists, wear SAA approved respirator or work in fume hood. Local exhaust ventilation may be required for safe working, i.e. to keep exposures below required standards, otherwise PPE is required. SAA approved acid-vapour respirator or full-face air supplied breathing apparatus. Correct respirator fit is essential to obtain adequate protection. Provide adequate ventilation in warehouse or closed storage areas.

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE
Volatile, white crystals with penetrating, aromatic odour. Sublimes (evaporates) at room temperature. Very slightly soluble in water; soluble in alcohol, acetone aromatics.

PHYSICAL PROPERTIES
Solid.
Does not mix with water.
Sinks in water.

Property	Value
Molecular Weight:	147.0
Melting Range (°C):	53.1
Solubility in water (g/L):	Insoluble
pH (1% solution):	Not applicable
Volatile Component (%vol):	100
Relative Vapor Density(air=1):	5.08
Lower Explosive Limit (%):	2.5
Autoignition Temp (°C):	560
State:	Divided Solid
Boiling Range (°C):	174
Specific Gravity (water=1):	1.46
pH (as supplied):	Not available
Vapour Pressure (kPa):	1.33 @ 54.8 C.
Evaporation Rate:	Slow
Flash Point (°C):	65 (Tag)
Upper Explosive Limit (%):	16
Decomposition Temp (°C):	>55
Viscosity:	Not available

Section 10 - CHEMICAL STABILITY AND REACTIVITY

CONDITIONS CONTRIBUTING TO INSTABILITY
- Presence of incompatible materials.
- Product is considered stable.

Hazardous polymerisation will not occur.

Section 11 - TOXICOLOGICAL INFORMATION

POTENTIAL HEALTH EFFECTS

ACUTE HEALTH EFFECTS
SWALLOWED
Considered an unlikely route of entry in commercial/industrial environments.
The material is discomforting and toxic if swallowed.

EYE
The material is highly discomforting to the eyes and is capable of causing pain and severe conjunctivitis. Corneal injury may develop, with possible permanent impairment of vision, if not promptly and adequately treated.
The vapour is discomforting to the eyes.
if exposure is prolonged.
The vapour from heated material is highly discomforting to the eyes.

SKIN
The material is moderately discomforting to the skin.
and it is absorbed by skin.
Toxic effects may result from skin absorption.
Absorption by skin may readily exceed vapour inhalation exposure. Symptoms for skin absorption are the same as for inhalation.
Bare unprotected skin should not be exposed to this material.
The material may accentuate any pre-existing skin condition.

INHALED
The vapour is discomforting to the upper respiratory tract if inhaled and the material may present a hazard from repeated exposures over long periods.
The use of a quantity of material in an unventilated or confined space may result in increased exposure and an irritating atmosphere developing.
Before starting consider control of exposure by mechanical ventilation.

CHRONIC HEALTH EFFECTS
Principal routes of exposure are usually by.
skin contact/absorption and inhalation of vapour.

TOXICITY AND IRRITATION

TOXICITY	
Oral (human) LDLo:	857 mg/kg
Oral (human) TDLo:	300 mg/kg
Oral (rat) LD50:	500 mg/kg
Dermal (rabbit) LD50:	>2000 mg/kg
Intraperitoneal (rat) LD50:	2562 mg/kg
Oral (mouse) LD50:	2950 mg/kg
Intraperitoneal (mouse) LD50:	2000 mg/kg
Oral (rabbit) LD50:	2830 mg/kg
Dermal (rabbit) LD50:	>2000 mg/kg

Eye effects, respiratory tract changes, diarrhoea, specific developmental effects (cardiovascular system) recorded.

IRRITATION	
Eye (human):	80 ppm

WARNING: This substance has been classified by the IARC as Group 2B: Possibly Carcinogenic to Humans.
Tenth Annual Report on Carcinogens: Substance is anticipated to be Carcinogen
[National Toxicology Program: U.S. Dep. of Health & Human Services 2002].

Section 12 - ECOLOGICAL INFORMATION

The material is classified as an ecotoxin* because it is NOT readily biodegradable and the Fish LC50 (96 hours) is less than or equal to 1 mg/l. Substances are considered to be readily biodegradable if the following levels of degradation are achieved in 28 days:

- In tests based on dissolved organic carbon: 70%
- In tests based on oxygen depletion or carbon dioxide generation: 60% of the theoretical maxima

These levels of biodegradation must be achieved within 10 days of the start of biodegradation, which point is taken as the time when 10% of the substance has been degraded.
* Classification of Substances as Ecotoxic (Dangerous to the Environment) Appendix 8,Table 1 Compiler's Guide for the Preparation of International Chemical Safety Cards: 1993 Commission of the European Communities.

Kow: 35	Half-life (hr) air: 200.6-2006
log Koc: 2.59-5	Half-life (hr) H2O surface water: 0.25-4320
Koc: 36000-100000	Half-life (hr) H2O ground: 1344-8760
log Kom: 2.2-2.53	Half-life (hr) soil: 672-4320

Section 13 - DISPOSAL CONSIDERATIONS

- Recycle wherever possible. Special hazard may exist - specialist advice may be required.
- Consult approved Waste Management Company for disposal options.
- Treat and neutralise residue at an approved site.
- Decontaminate empty containers. Observe all label safeguards until containers are cleaned and destroyed.
- Puncture containers to prevent re-use and bury at an authorised landfill.
- For further information on disposal and specific advice on controls required for materials used in New Zealand consult http://www.ermanz.govt.nz/search/registers.html

Section 14 - TRANSPORT INFORMATION

Labels Required: MISCELLANEOUS

HAZCHEM: 2X
UNDG:

Dangerous Goods Class:	9	Subrisk:	None
UN Number:	3077	Packing Group:	III

Shipping Name:ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S.
Air Transport IATA:

ICAO/IATA Class:	9	ICAO/IATA Subrisk:	None
UN/ID Number:	3077	Packing Group:	III
ERG Code:	9L		

Shipping Name: Environmentally hazardous substance, solid, n.o.s. *
Maritime Transport IMDG:

IMDG Class:	9	IMDG Subrisk:	None
UN Number:	3077	Packing Group:	III
EMS Number:	F-A,S-F	Marine Pollutant:	Not Determined

Shipping Name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S.

Section 15 – REGULATORY INFORMATION

REGULATIONS

1, 4- dichlorobenzene (CAS: 106- 46- 7) is found on the following regulatory lists;
Great Lakes Binational Toxics Strategy Substances (U.S. and Canada) - Level II Substances
International Agency for Research on Cancer (IARC) Carcinogens
New Zealand Transferred List of Single Component Substances
New Zealand Workplace Exposure Standards (WES)
OECD Representative List of High Production Volume (HPV) Chemicals
WHO Guidelines for Drinking- water Quality - Guideline values for chemicals that are of health significance in drinking- water
Specific advice on controls required for materials used in New Zealand can be found at
http://www.ermanz.govt.nz/search/registers.html

Section 16 – OTHER INFORMATION

NATIONAL POISONS INFORMATION CENTRE 0800 POISON (0800 764 766)
EMERGENCY SERVICES: 111

Interpretation and Abbreviations

Controls applying to a substance:

- denotes that changes have been made to these controls, further information on these changes is located in the transfer notice for that substance, http://www.ermanz.govt.nz/search/registers.html
- (R) abbreviation for the term Regulation of the Hazardous Substances regulations

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