

## SECTION 1 - IDENTIFICATION OF CHEMICAL PRODUCT AND COMPANY

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**Substance:** Trichlorfon is an organophosphorus pesticide.  
**Trade Name:** Dipterex® 500 SL Insecticide  
**Product Use:** Agricultural insecticide for use as described on the product label.  
**Creation Date:** October, 2006  
**Revision Date:** October, 2006

## Section 2 - Hazards Identification

### Statement of Hazardous Nature

This product is classified as: Xi, Irritating. T, Toxic. N, Dangerous to the environment. F, Flammable. Hazardous according to the criteria of ASCC.

Dangerous according to the Australian Dangerous Goods (ADG) Code.

**Risk Phrases:** R10, R25, R43, R60, R61, R36/38, R51/53. Flammable. Toxic if swallowed. May cause sensitisation by skin contact. May impair fertility. May cause harm to the unborn child. Irritating to eyes and skin. Toxic to aquatic organisms, may cause long-term adverse effects to the aquatic environment.

**Safety Phrases:** S2, S16, S20, S28, S24/25, S36/37. Keep out of reach of children. Keep away from sources of ignition - No smoking. When using, do not eat or drink. After contact with skin, wash immediately with plenty of soap and water. Avoid contact with skin and eyes. Wear suitable protective clothing and gloves.

**SUSDP Classification:** S6

**ADG Classification:** Class 6.1, Sub risk 3 (ORGANOPHOSPHORUS PESTICIDE, LIQUID, TOXIC, FLAMMABLE)

**UN Number:** 3017

### Emergency Overview

**Physical Description & colour:** Clear, colourless liquid.

**Odour:** Aromatic chemical odour.

**Major Health Hazards:** toxic if swallowed, may impair fertility, may cause harm to unborn children, irritating to eyes and skin, possible skin sensitiser. Signs and symptoms associated with mild exposures to organophosphate and carbamate pesticides include: headache, fatigue, dizziness, loss of appetite with nausea, stomach cramps and diarrhoea; blurred vision associated with excessive tearing; contracted pupils of the eye; excessive sweating and salivation; slowed heartbeat, often fewer than 50 per minute; rippling of surface muscles just under the skin. These symptoms may be mistaken for those of flu, heat stroke or heat exhaustion, or upset stomach. Moderately severe organophosphate and carbamate insecticide poisoning cases exhibit all the signs and symptoms found in mild poisonings, but in addition, the victim: is unable to walk; often complains of chest discomfort and tightness; exhibits marked constriction of the pupils (pinpoint pupils); exhibits muscle twitching; has involuntary urination and bowel movement. Severe poisonings are indicated by incontinence, unconsciousness and seizures.

### Potential Health Effects

See section 11 for Chronic exposure studies.

#### Inhalation:

**Short term exposure:** Symptoms are described fully above.

#### Skin Contact:

**Short term exposure:** Symptoms are described fully above.

#### Eye Contact:

**Short term exposure:** This product is an eye irritant. Symptoms may include stinging and reddening of eyes and watering which may become copious. Other symptoms may also become evident. If exposure is brief, symptoms should disappear once exposure has ceased. However, lengthy exposure or delayed treatment may cause permanent damage.

#### Ingestion:

**Short term exposure:** Symptoms are described fully above.

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**Carcinogen Status:**

**ASCC:** No significant ingredient is classified as carcinogenic by ASCC.

**NTP:** No significant ingredient is classified as carcinogenic by NTP.

**IARC:** Trichlorfon is Class 3 - unclassifiable as to carcinogenicity to humans.

See the IARC website for further details. A web address has not been provided as addresses frequently change.

**Section 3 - Composition/Information on Ingredients**

Ingredients	CAS No	Conc, %	TWA (mg/m <sup>3</sup> )	STEL (mg/m <sup>3</sup> )
Trichlorfon	52-68-6	500g/L	not set	not set
Propylene glycol monomethyl ether	107-98-2	535g/L	369	553
N-Methyl-2-pyrrolidone	872-50-4	115g/L	103	309

This is a commercial product whose exact ratio of components may vary slightly. Minor quantities of other non hazardous ingredients are also possible.

The ASCC TWA exposure value is the average airborne concentration of a particular substance when calculated over a normal 8 hour working day for a 5 day working week. The STEL (Short Term Exposure Limit) is an exposure value that may be equalled (but should not be exceeded) for no longer than 15 minutes and should not be repeated more than 4 times per day. There should be at least 60 minutes between successive exposures at the STEL. The term "peak" is used when the TWA limit, because of the rapid action of the substance, should never be exceeded, even briefly.

**Section 4 - First Aid Measures****General Information:**

You should call The Poisons Information Centre if you feel that you may have been poisoned, burned or irritated by this product. The number is 13 1126 from anywhere in Australia (0800 764 766 in New Zealand) and is available at all times. Have this MSDS with you when you call.

Atropine tablets 0.6mg and activated charcoal should be available in the area where this product is used, or in a nearby unlocked medicine cabinet. If swallowed, splashed on skin or inhaled, contact a Poisons Information Centre or a doctor at once. Remove any contaminated clothing and wash skin thoroughly. If swallowed, use of activated charcoal may be advised. Give atropine if instructed. The usual instruction is to give one atropine tablet every 5 minutes until dryness of the mouth occurs.

**Inhalation:** No first aid measures normally required. However, if inhalation has occurred, and irritation has developed, remove to fresh air and observe until recovered. If irritation becomes painful or persists more than about 30 minutes, seek medical advice. See instructions above about treatment with atropine.

**Skin Contact:** Quickly and gently blot away excess liquid. Wash gently and thoroughly with warm water (use non-abrasive soap if necessary) for 10-20 minutes or until product is removed. Under running water, remove contaminated clothing, shoes and leather goods (e.g. watchbands and belts) and completely decontaminate them before reuse or discard. If irritation persists, repeat flushing and seek medical attention. See instructions above about treatment with atropine.

**Eye Contact:** Immediately flush the contaminated eye(s) with lukewarm, gently flowing water for 20 minutes or until the product is removed, while holding the eyelid(s) open. Take care not to rinse contaminated water into the unaffected eye or onto the face. Obtain medical attention immediately. Take special care if exposed person is wearing contact lenses.

**Ingestion:** If swallowed, do NOT induce vomiting; rinse mouth thoroughly with water and contact a Poisons Information Centre, or call a doctor at once. Give activated charcoal if instructed. See instructions above about treatment with atropine.

**Section 5 - Fire Fighting Measures**

**Fire and Explosion Hazards:** This product is classified as flammable. There is a moderate risk of an explosion from this product if commercial quantities are involved in a fire. Firefighters should take care and appropriate precautions. Violent steam generation or eruption may occur upon application of direct water stream on hot liquids. Vapours from this product are heavier than air and may accumulate in sumps, pits and other low-lying spaces, forming potentially explosive mixtures. They may also flash back considerable distances.

Fire decomposition products from this product may be toxic if inhaled. Take appropriate protective measures.

**Extinguishing Media:** Preferred extinguishing media are carbon dioxide, dry chemical, foam, water fog. Foam is the preferred medium for large fires. Ensure that no spillage enters drains or water courses.

**Fire Fighting:** Immediately evacuate the area of unnecessary personnel.

**Flash point:** >35°C

**Upper Flammability Limit:** 36.5%

**Lower Flammability Limit:** 6.0% (solvent)

**Autoignition temperature:** 725°C (solvent)

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Flammability Class: Flammable

## Section 6 - Accidental Release Measures

**Accidental release:** In the event of a major spill, prevent spillage from entering drains or water courses. Evacuate the spill area and deny entry to unnecessary and unprotected personnel. Immediately call the Fire Brigade. Wear full protective chemically resistant clothing including eye/face protection, gauntlets and self contained breathing apparatus. See below under Personal Protection regarding Australian Standards relating to personal protective equipment. Suitable materials for protective clothing include rubber, PVC, butyl rubber. Eye/face protective equipment should comprise as a minimum, protective goggles. If there is a significant chance that vapours or mists are likely to build up in the cleanup area, we recommend that you use a respirator. It should be fitted with a type G cartridge, suitable for agricultural chemicals. Otherwise, not normally necessary.

Stop leak if safe to do so, and contain spill. Absorb onto sand, vermiculite or other suitable absorbent material. If spill is too large or if absorbent material is not available, try to create a dike to stop material spreading or going into drains or waterways. Because of the toxicity of this product, special personal care should be taken in any cleanup operation. Sweep up and shovel or collect recoverable product into labelled containers for recycling or salvage, and dispose of promptly. Recycle containers wherever possible after careful cleaning. Refer to product label for specific instructions. After spills, wash area preventing runoff from entering drains. If a significant quantity of material enters drains, advise emergency services. Full details regarding disposal of used containers, spillage and unused material may be found on the label. If there is any conflict between this MSDS and the label, instructions on the label prevail. Ensure legality of disposal by consulting regulations prior to disposal. Thoroughly launder protective clothing before storage or re-use. Advise laundry of nature of contamination when sending contaminated clothing to laundry.

## Section 7 - Handling and Storage

**Handling:** Keep exposure to this product to a minimum, and minimise the quantities kept in work areas. Check Section 8 of this MSDS for details of personal protective measures, and make sure that those measures are followed. The measures detailed below under "Storage" should be followed during handling in order to minimise risks to persons using the product in the workplace. Also, avoid contact or contamination of product with incompatible materials listed in Section 10.

**Storage:** This product is a Scheduled Poison. Observe all relevant regulations regarding sale, transport and storage of this schedule of poison. Store in a cool, well ventilated area. Check containers periodically for leaks. Containers should be kept closed in order to minimise contamination. Make sure that the product does not come into contact with substances listed under "Incompatibilities" in Section 10. If you keep more than 10000kg or L of Dangerous Goods of Packaging Group III, you may be required to license the premises or notify your Dangerous Goods authority. If you have any doubts, we suggest you contact your Dangerous Goods authority in order to clarify your obligations. Check packaging - there may be further storage instructions on the label.

## Section 8 - Exposure Controls and Personal Protection

The following Australian Standards will provide general advice regarding safety clothing and equipment:

Respiratory equipment: **AS/NZS 1715**, Protective Gloves: **AS 2161**, Industrial Clothing: **AS2919**, Industrial Eye Protection: **AS1336** and **AS/NZS 1337**, Occupational Protective Footwear: **AS/NZS2210**.

ASCC Exposure limits	TWA (mg/m <sup>3</sup> )	STEL (mg/m <sup>3</sup> )
Propylene glycol monomethyl ether	369	553
N-Methyl-2-pyrrolidone	103	309

The ADI for Trichlorfon is set at 0.002mg/kg/day. The corresponding NOEL is set at 0.2mg/kg/day. ADI means Acceptable Daily Intake and NOEL means No-observable-effect-level. Values taken from Australian ADI List, Dec 2005.

No special equipment is usually needed when occasionally handling small quantities. The following instructions are for bulk handling or where regular exposure in an occupational setting occurs without proper containment systems.

**Ventilation:** This product should only be used where there is ventilation that is adequate to keep exposure below the TWA levels. If necessary, use a fan.

**Eye Protection:** Protective glasses or goggles should be worn when this product is being used. Failure to protect your eyes may cause them harm. Emergency eye wash facilities are also recommended in an area close to where this product is being used.

**Skin Protection:** If you believe you may have a sensitisation to this product or any of its declared ingredients, you should prevent skin contact by wearing impervious gloves, clothes and, preferably, apron. Make sure that all skin areas are covered. See below for suitable material types.

**Protective Material Types:** We suggest that protective clothing be made from the following materials: rubber, PVC, butyl rubber.

**Respirator:** Usually, no respirator is necessary when using this product. However, if you have any doubts consult the Australian Standard mentioned above. Otherwise, not normally necessary.

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Eyebaths or eyewash stations and safety deluge showers should be provided near to where this product is being used.

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## Section 9 - Physical and Chemical Properties:

<b>Physical Description &amp; colour:</b>	Clear, colourless liquid.
<b>Odour:</b>	Aromatic chemical odour.
<b>Boiling Point:</b>	120°C at 100kPa (solvent system)
<b>Freezing/Melting Point:</b>	No specific data. Liquid at normal temperatures.
<b>Volatiles:</b>	No data.
<b>Vapour Pressure:</b>	0.21 kPa at 20°C (trichlorfon); 1.67kPa at 25°C (solvent)
<b>Vapour Density:</b>	No data.
<b>Specific Gravity:</b>	1.15 at 20°C
<b>Water Solubility:</b>	Soluble.
<b>pH:</b>	2.0-3.0 (10% in water)
<b>Volatility:</b>	No data.
<b>Odour Threshold:</b>	No data.
<b>Evaporation Rate:</b>	No data.
<b>Coeff Oil/water distribution:</b>	0.43 at 20°C (Trichlorfon) (log P octanol/water)
<b>Autoignition temp:</b>	725°C (solvent)

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## Section 10 - Stability and Reactivity

**Reactivity:** Solvent is slightly corrosive to aluminium and copper.

**Conditions to Avoid:** This product should be kept in a cool place, preferably below 30°C. Keep containers tightly closed. Containers should be kept dry. Keep containers and surrounding areas well ventilated. Keep away from heat, flames and sparks. Keep away from sources of sparks or ignition. Any electrical equipment in the area of this product should be flame proofed.

**Incompatibilities:** acids, strong bases, oxidising agents, strong oxidising agents, oils.

**Fire Decomposition:** Carbon dioxide, and if combustion is incomplete, carbon monoxide and smoke. Nitrogen and its compounds, and under some circumstances, oxides of nitrogen. Occasionally hydrogen cyanide gas in reducing atmospheres. Oxides of phosphorus and other phosphorus compounds. Hydrogen chloride gas, other compounds of chlorine. Water. Carbon monoxide poisoning produces headache, weakness, nausea, dizziness, confusion, dimness of vision, disturbance of judgment, and unconsciousness followed by coma and death.

**Polymerisation:** This product will not undergo polymerisation reactions.

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## Section 11 - Toxicological Information

### Local Effects:

Trichlorfon is Classed by ASCC as a potential sensitiser by skin contact.

**Acute toxicity:** Trichlorfon is moderately toxic by ingestion or dermal absorption. As with all organophosphates, trichlorfon is readily absorbed through the skin. Symptoms of acute exposure include headache, giddiness, nervousness, blurred vision, weakness, nausea, cramps, loss of muscle control or reflexes, convulsion, or coma.

**Chronic toxicity:** Repeated or prolonged exposure to organophosphates may result in the same effects as acute exposure. Other effects reported in workers repeatedly exposed include impaired memory and concentration, disorientation, severe depressions, irritability, confusion, headache, speech difficulties, delayed reaction times, nightmares, sleepwalking, and drowsiness or insomnia.

**Reproductive effects:** Trichlorfon is suspected of having negative reproductive effects. It is unlikely that reproductive effects will occur in humans at expected exposure levels.

**Teratogenic effects:** Trichlorfon caused inability to walk and tremors in pig offspring if administered at day 55 at a dose of 55 mg/kg. The evidence suggests that reproductive effects occur only at high doses and are unlikely in humans at expected exposure levels.

**Mutagenic effects:** Studies indicate that trichlorfon, or its degradation products, can be mutagenic in bacterial and mammalian cells.

**Carcinogenic effects:** One study suggests that oral doses of 37.5 to 75 mg/kg/day of trichlorfon contribute to the production of tumours in rats. The carcinogenic data however are inconclusive.

**Organ toxicity:** Trichlorfon primarily affects the nervous system through inhibition of cholinesterase, and enzyme required for proper nerve functioning. Other target organs include the liver, lungs, and bone marrow (blood-forming tissue).

**Fate in humans and animals:** The absorption, distribution, and excretion of trichlorfon is rapid. About 70 to 80% of a dose administered orally to mice was excreted during the first 12 hours following treatment. Similar rapid elimination was seen in pigs following intraperitoneal injection.

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## Classification of Hazardous Ingredients

Ingredient	Risk Phrases
Trichlorfon	Conc>=25%: Xn; R22; R43
N-methyl-2-pyrrolidone	Conc>=10%: Xi; R36/38

## Section 12 - Ecological Information

Toxic to aquatic organisms, may cause long-term adverse effects to the aquatic environment. This product is biodegradable. It will not accumulate in the soil or water or cause long term problems.

**Effects on birds:** Trichlorfon is moderately to highly toxic to birds. Signs of intoxication in birds include regurgitation, imbalance, trembling, slowness, lack of movement, and wing-beat convulsions. Signs of poisoning appear as soon as 10 minutes after exposure, and death usually occurs within 30 minutes to 3 hours of treatment.

**Effects on aquatic organisms:** Trichlorfon, in both technical and formulated forms, is very highly toxic to many aquatic species such as Daphnia, stoneflies, crayfish, and several freshwater fish species. Generally, toxicity increased (i.e., observed LC<sub>50</sub> was lower) with higher temperature and higher pH. Studies did not show a potential for trichlorfon to accumulate in fish.

**Effects on other organisms:** Trichlorfon has moderate to high acute toxicity toward certain beneficial or non-target insects. This pesticide may be toxic to other wildlife. Data indicate that trichlorfon has a low toxicity to bees; it can be used around bees with minimum injury.

Environmental Fate:

**Breakdown in soil and groundwater:** Trichlorfon breaks down, or degrades, rapidly in aerobic soils, with a half-life of between 3 and 27 days. An average half-life of 10 days has been reported. Soil organic matter content does not appear to influence trichlorfon's movement in soil.

**Breakdown in water:** Trichlorfon degrades rapidly in alkaline pond water (pH 8.5). Approximately 99% of applied trichlorfon was broken down within 2 hours.

**Breakdown in vegetation:** Studies on the dissipation of trichlorfon in forest environments indicate that it does not persist in leaves or leaf-litter. The approximate residual period is 7 to 10 days on plants.

## Section 13 - Disposal Considerations

**Disposal:** There are many pieces of legislation covering waste disposal and they differ in each state and territory, so each user must refer to laws operating in their area. In some areas, certain wastes must be tracked. The Hierarchy of Controls seems to be common - the user should investigate: Reduce, Reuse, and Recycle and only if all else fails should disposal be considered. Note that properties of a product may change in use, so that the following suggestions may not always be appropriate. The following may help you in properly addressing this matter for this product. Special help is available for the disposal of Agricultural Chemicals. The product label will give general advice regarding disposal of small quantities, and how to cleanse containers. However, for help with the collection of unwanted rural chemicals, contact ChemClear 1800 008 182 <http://www.chemclear.com.au/> and for help with the disposal of empty drums, contact DrumMuster <http://www.drummuster.com.au/> where you will find contact details for your area.

## Section 14 - Transport Information

**ADG Code:** 3017, ORGANOPHOSPHORUS PESTICIDE, LIQUID, TOXIC, FLAMMABLE

**Hazchem Code:** 3W

**Special Provisions:** SP61, SP109, SP274

**Dangerous Goods Class:** Class 6.1, Toxic Substances.

**Sub Risk:** Class 3, Flammable liquids.

**Packaging Group:** III

**Packaging Method:** 3.8.6

Class 6 Toxic Substances shall not be loaded in the same vehicle or packed in the same freight container with Classes 1 (Explosives), 3 (Flammable Liquids where the Flammable Liquid is nitromethane), 5.1 (Oxidising Agents where the Toxic Substances are Fire Risk Substances), 5.2 (Organic Peroxides where the Toxic Substances are Fire Risk Substances), 8 (Corrosive Substances where the Toxic Substances are cyanides and the Corrosives are acids), Foodstuffs and foodstuff empties. They may however be loaded in the same vehicle or packed in the same freight container with Classes, 2.1 (Flammable Gases), 2.2 (Non-Flammable, Non-Toxic Gases), 2.3 (Toxic Gases), 3 (Flammable liquids, except where the flammable liquid is nitromethane), 4.1 (Flammable Solids), 4.2 (Spontaneously Combustible Substances), 4.3 (Dangerous When Wet Substances), 5.1 (Oxidising Agents except where the Toxic Substances are Fire Risk Substances), 5.2 (Organic Peroxides except where the Toxic Substances are Fire Risk Substances), 7 (Radioactive Substances), 8 (Corrosive Substances except where the Toxic Substances are cyanides and the Corrosives are acids), 9 (Miscellaneous Dangerous Goods)

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## Section 15 - Regulatory Information

**AICS:** All of the significant ingredients in this formulation are compliant with NICNAS regulations. The following ingredients: Trichlorfon, are mentioned in the SUSDP.

## Section 16 - Other Information

This MSDS contains only safety-related information. For other data see product literature.

### Acronyms:

<b>ADG Code</b>	Australian Code for the Transport of Dangerous Goods by Road and Rail
<b>AICS</b>	Australian Inventory of Chemical Substances
<b>ASCC</b>	Office of the Australian Safety and Compensation Council
<b>CAS number</b>	Chemical Abstracts Service Registry Number
<b>Hazchem Code</b>	Emergency action code of numbers and letters that provide information to emergency services especially firefighters
<b>IARC</b>	International Agency for Research on Cancer
<b>NOS</b>	Not otherwise specified
<b>NTP</b>	National Toxicology Program (USA)
<b>R-Phrase</b>	Risk Phrase
<b>SUSDP</b>	Standard for the Uniform Scheduling of Drugs & Poisons
<b>UN Number</b>	United Nations Number

THIS MSDS SUMMARISES OUR BEST KNOWLEDGE OF THE HEALTH AND SAFETY HAZARD INFORMATION OF THE PRODUCT AND HOW TO SAFELY HANDLE AND USE THE PRODUCT IN THE WORKPLACE. EACH USER MUST REVIEW THIS MSDS IN THE CONTEXT OF HOW THE PRODUCT WILL BE HANDLED AND USED IN THE WORKPLACE.

IF CLARIFICATION OR FURTHER INFORMATION IS NEEDED TO ENSURE THAT AN APPROPRIATE RISK ASSESSMENT CAN BE MADE, THE USER SHOULD CONTACT THIS COMPANY SO WE CAN ATTEMPT TO OBTAIN ADDITIONAL INFORMATION FROM OUR SUPPLIERS. OUR RESPONSIBILITY FOR PRODUCTS SOLD IS SUBJECT TO OUR STANDARD TERMS AND CONDITIONS, A COPY OF WHICH IS SENT TO OUR CUSTOMERS AND IS ALSO AVAILABLE ON REQUEST.

Please read all labels carefully before using product.

This MSDS is prepared in accord with the ASCC document "National Code of Practice for the Preparation of Material Safety Data Sheets" 2nd Edition [ASCC:2011(2003)]

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## MATERIAL SAFETY DATA SHEET