Section 1 - Identification of Chemical Product and Company

Statement of Hazardous Nature
This product is classified as: Not Hazardous according to the criteria of NOHSC Australia.

Not a Dangerous Good according to the Australian Dangerous Goods (ADG) Code.

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Substance:	Chlorinated aromatic nitrile derivative.
Trade Name:	Farmoz Fung-O-Nil 500 Flowable Agricultural Fungicide
Product Use:	Agricultural fungicide for use as described on the product label.
Creation Date:	**July, 2002**
Revision Date:	**July, 2002**

Section 2 – Composition/Information on Ingredients

Ingredients	CAS No	Conc,%	TWA (mg/m^3)	STEL (mg/m^3)
Chlorothalonil	1897-45-6	50	not set	not set
Other non hazardous ingredients	secret	to 100	not set	not set

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

The 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 should not be exceeded for more than 15 minutes and should not be repeated for 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 3 - Hazards Identification

Risk Phrases: Not Hazardous - No criteria found.
Safety Phrases: Not Hazardous - No criteria found.
SUSDP Classification: S6
ADG Classification: None allocated. Not a Dangerous Good.
UN Number: None allocated

Emergency Overview

Physical Description & colour: White viscous suspension.
Odour: Mild odour.
Major Health Hazards: Chlorothalonil is slightly toxic to mammals, but it can cause severe eye and skin irritation in certain formulations. Very high doses may cause a loss of muscle coordination, rapid breathing, nose bleeding, vomiting, hyperactivity, and death. Dermatitis, vaginal bleeding, bright yellow and/or bloody urine, and kidney tumors may also occur.

Potential Health Effects

See section 11 for Chronic exposure studies.

Inhalation
Short term exposure: Available data indicates that this product is not harmful. In addition, this product may be irritating, but is unlikely to cause anything more than mild transient discomfort.

Skin Contact:
Short term exposure: Available data indicates that this product is not harmful. It should present no hazards in normal use. In addition, this product is believed to be mildly irritating, but is unlikely to cause anything more than mild transient discomfort.

Eye Contact:
Short term exposure: Available data shows that this product is not harmful. In addition, 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: This product is unlikely to cause any health problems in the short or long term.

Carcinogen Status:

NOHSC: No significant ingredient is classified as carcinogenic by NOHSC.
NTP: No significant ingredient is classified as carcinogenic by NTP.
IARC: Chlorothalonil is classed by IARC as being possibly carcinogenic to humans.

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 and is available at all times. Have this MSDS with you when you call.

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.
Skin Contact: Blot or brush away excess chemical. Wash gently and thoroughly with water (use non-abrasive soap if necessary) for 10 minutes or until chemical is removed. Under running water, remove contaminated clothing, shoes and leather goods (e.g. watchbands and belts). If irritation persists, repeat flushing and obtain medical advice.
Eye Contact: Quickly and gently blot or brush away product. 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.
Ingestion: First aid is not generally required. If in doubt, contact a Poisons Information Centre or a doctor.

Section 5 – Fire Fighting Measures

Fire and Explosion Hazards: There is no risk of an explosion from this product under normal circumstances if it is involved in a fire.
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.
Fire Fighting:

Flash point:	No data
Upper Flammability Limit:	No data.
Lower Flammability Limit:	No data.
Autoignition temperature:	No data.
Flammability Class:	No data.

Section 6 – Accidental Release Measures

Accidental release: In the event of a major spill, prevent spillage from entering drains or water courses. Wear full protective clothing including face mask, face shield and gauntlets. All skin areas should be covered. See above under Personal Protection regarding Australian Standards relating to personal protective equipment. Suitable materials for protective clothing include rubber, PVC. 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. Sweep up and shovel or collect recoverable product into labelled containers for recycling or salvage, and dispose of promptly. 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 class of poison. Store packages of this product in a cool place. Make sure that the product does not come into contact with substances listed under "Materials to avoid" in Section 10. Some liquid preparations settle or separate on standing and may require stirring before use. 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**.

Exposure Limits	**TWA (mg/m^3)**	**STEL (mg/m^3)**

Exposure limits have not been established by NOHSC for any of the significant ingredients in this product.

The ADI for Chlorothalonil is set at 0.01mg/kg/day. The corresponding NOEL is set at 1.5mg/kg/day. ADI means Acceptable Daily Intake and NOEL means No-observable-effect-level. Values taken from Australian ADI List, January 2001.

Ventilation: No special ventilation requirements are normally necessary for this product. However make sure that the work environment remains clean and that dusts are minimised.
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: You should avoid contact even with mild skin irritants. Therefore you should wear suitable impervious elbow-length gloves and facial protection when handling this product. See below for suitable material types.
Protective Material Types: We suggest that protective clothing be made from the following materials: rubber, PVC.
Respirator: If there is a significant chance that vapours or mists are likely to build up in the area where this product is being used, we recommend that you use a respirator. It should be fitted with a type G cartridge, suitable for agricultural chemicals. Otherwise, not normally necessary.

Section 9 - Physical and Chemical Properties:

Physical Description & colour:	White viscous suspension.
Odour:	Mild odour.
Boiling Point:	Boils at about 100°C at 100kPa.
Freezing/Melting Point:	No specific data. Liquid at normal temperatures.
Volatiles:	No data.
Vapour Pressure:	No data.
Vapour Density:	No data.
Specific Gravity:	No data. Expected to be more than 1.0
Water Solubility:	Miscible.
pH:	No data.
Volatility:	No data.
Odour Threshold:	No data.
Evaporation Rate:	No data.
Coeff Oil/water distribution:	No data
Autoignition temp:	No data.

Section 10 – Stability and Reactivity

Reactivity: This product is unlikely to react or decompose under normal storage conditions. However, if you have any doubts, contact the supplier for advice on shelf life properties.
Conditions to Avoid: None known.
Incompatibilities: strong acids, strong bases, strong oxidising agents.
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. 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. Hydrogen cyanide poisoning signs and symptoms are weakness, dizziness, headache, nausea, vomiting, coma, convulsions, and death. Death results from respiratory arrest. Hydrogen cyanide gas acts very rapidly; symptoms and death can both occur quickly.

Polymerisation: This product is unlikely to undergo polymerisation processes.

Section 11 – Toxicological Information

Toxicity: **Acute toxicity:** Chlorothalonil is slightly toxic to mammals, but it can cause severe eye and skin irritation in certain formulations. Very high doses may cause a loss of muscle coordination, rapid breathing, nose bleeding, vomiting, hyperactivity, and death. Dermatitis, vaginal bleeding, bright yellow and/or bloody urine, and kidney tumors may also occur. The oral LD_{50} is greater than 10,000 mg/kg in rats and 6000 mg/kg in mice. The acute dermal LD_{50} in both albino rabbits and albino rats is 10,000 mg/kg. In albino rabbits, 3 mg of Chlorothalonil applied to the eyes caused mild irritation that subsided within 7 days of exposure.
Chronic toxicity: In a number of tests of varying lengths of time, rats fed a range of doses of Chlorothalonil generally showed no effects on physical appearance, behavior, or survival. Skin contact with Chlorothalonil may result in dermatitis or light sensitivity. Human eye and skin irritation is linked to Chlorothalonil exposure; 14 of 20 workers exposed to 0.5% Chlorothalonil in a wood preservative developed dermatitis. All workers showed swelling and inflammation of the upper eyelids. Allergic skin responses have also been noted in farm workers.
Reproductive effects: Administration of high doses of Chlorothalonil to pregnant rabbits through the stomach during the sensitive period of gestation was required to induce abortion in 4 of the 9 mothers. This and other studies suggest that Chlorothalonil will not affect human reproduction at expected exposure levels.
Teratogenic effects: Long-term studies indicate that high doses fed to rats caused reduced weight gains for males and females in each generation studied. Female rats given high doses of Chlorothalonil through the stomach during the sensitive period of gestation had normal foetuses, even though that dose was toxic to the mothers. A study of birth defects in rabbits showed no effects. Chlorothalonil is not expected to produce birth defects in humans.
Mutagenic effects: Mutagenicity studies on various animals, bacteria, and plants indicate that Chlorothalonil does not cause any genetic changes. The compound is not expected to pose mutagenic risks to humans.
Carcinogenic effects: Based on evidence from animal studies, Chlorothalonil's carcinogenic potential is unclear. Male and female rats fed Chlorothalonil daily over a lifetime developed carcinogenic and benign kidney tumors at the higher doses. In another study, where mice were fed high daily doses of Chlorothalonil for 2 years, females developed tumors in the fore-stomach area (attributed to irritation by the compound) and males developed carcinogenic and benign kidney tumors.
Organ toxicity: Chronic studies of rats and dogs fed high dietary levels show that Chlorothalonil is toxic to the kidney. In addition to less urine output, changes in the kidney included enlargement, greenish-brown color, and development of small grains.
Fate in humans and animals: Chlorothalonil is rapidly excreted, primarily unchanged, from the body. It is not stored in animal tissues. Rats and dogs fed very high doses for 2 years eliminated almost all of the chemical in urine, faeces, and expired air. At lower concentrations, Chlorothalonil leaves the body within 24 hours. Residues have not been found in the tissues or milk of dairy cows fed Chlorothalonil.

Section 12 – Ecological Information

This product is biodegradable. It will not accumulate in the soil or water or cause long term problems.
Effects on birds: Chlorothalonil is practically nontoxic to birds. The LD_{50} in mallard ducks is 5000 mg/kg. Most avian wildlife are not significantly affected by this compound.
Effects on aquatic organisms: Chlorothalonil and its metabolites are highly toxic to fish, aquatic invertebrates, and marine organisms. Fish, such as rainbow trout, bluegill, and channel catfish are noticeably affected even when Chlorothalonil levels are low (less than 1 mg/L). The LC_{50} is 0.25 mg/L in rainbow trout, 0.3 mg/L in bluegills, and 0.43 mg/L in channel catfish. Chlorothalonil does not store in fatty tissues and is rapidly excreted from the body. Its bioaccumulation factor is quite low.
Effects on other organisms: The compound is nontoxic to bees.
Environmental Fate:
Breakdown in soil and groundwater: Chlorothalonil is moderately persistent. In aerobic soils, the half-life is from 1 to 3 months. Increased soil moisture or temperature increases Chlorothalonil degradation. It is not degraded by sunlight on the soil surface. Chlorothalonil has high binding and low mobility in silty loam and silty clay loam soils, and has low binding and moderate mobility in sand. Chlorothalonil was not found in any of 560 groundwater samples collected from 556 U.S. sites.
Breakdown in water: In very basic water (pH 9.0), about 65% of the Chlorothalonil was degraded into two major metabolites after 10 weeks. Chlorothalonil was found in one surface water location in Michigan at 6.5 mg/L.
Breakdown in vegetation: Chlorothalonil's residues may remain on above-ground crops at harvest, but will dissipate over time. Chlorothalonil is a fairly persistent fungicide on plants, depending on the rate of application. Small amounts of one metabolite may be found in harvested crops.

Section 13 – Disposal Considerations

Disposal: Instructions concerning the disposal of this product and its containers are given on the product label. These should be carefully followed.

Section 14 – Transport Information

ADG Code: This product is not classified as a Dangerous Good. No special transport conditions are necessary unless required by other regulations.

Section 15 – Regulatory Information

AICS: All of the significant ingredients in this formulation are to be found in the public AICS Database.

Section 16 – Other Information

Much of the Information in this MSDS came from Extoxnet, a Pesticide Information Project of Cooperative Extension Offices of Cornell University, Oregon State University, the University of Idaho, and the University of California at Davis and the Institute for Environmental Toxicology, Michigan State University.

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

Acronyms:

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

Contact Points:

Call Farmoz on (02)9363 3611 **Fax: (02)9363 5977 and ask for the technical manager.**

Police and Fire Brigade:	**Dial 000**
Emergency contact:	**1800 024 973 (24 hours)**

If ineffective: **Dial Poisons Information Centre (13 1126 from anywhere in Australia)**

The information contained in this Material Safety Data Sheet is provided in good faith and is believed to be correct at the date hereof. However, it is expected that individuals receiving the information will exercise their independent judgement in determining its appropriateness for a particular purpose. Farmoz Pty Ltd makes no representation as to the accuracy or comprehensiveness of the information and to the full extent allowed by law excludes all liability whatsoever, whether with respect to negligence or otherwise, for any loss or damage arising from or connection with the supply or use of the information in this Material Safety Data Sheet.

Please read all labels carefully before using product.

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