Section 1 - Identification of Chemical Product and Company

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Substance:	Dicofol is an organochlorine derivative.
Trade Name:	Farmoz Miti-Fol EC Miticide
Product Use:	Agricultural miticide for use as described on the product label.
Creation Date:	**July, 2002**
Revision Date:	**October, 2008**

Section 2 - Hazards Identification

Statement of Hazardous Nature

This product is classified as: Hazardous according to the criteria of ASCC Australia.

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

Risk Phrases: R10, R43, R66, R20/21/22, R36/38. Flammable. May cause sensitisation by skin contact. Repeated exposure may cause skin dryness or cracking. Harmful by inhalation, in contact with skin, and if swallowed. Irritating to eyes and skin.
Safety Phrases: S16, S20, S28, S38, S24/25. Keep away from sources of ignition - No smoking. When using, do not eat or drink. After contact with skin, wash immediately with plenty of water. In case of insufficient ventilation, wear suitable respiratory equipment. Avoid contact with skin and eyes.
SUSDP Classification: S6
ADG Classification: Class 3 (FLAMMABLE LIQUID, N.O.S.)
UN Number: 1993

Emergency Overview

Physical Description & colour: Brown mobile liquid.
Odour: Characteristic xylene odour.
Major Health Hazards: Dicofol is moderately toxic to practically nontoxic and may be absorbed through ingestion, inhalation, or skin contact. Symptoms of exposure include nausea, dizziness, weakness, and vomiting from ingestion or respiratory exposure, skin irritation or rash from dermal exposure, and conjunctivitis from eye contact. Poisoning may affect the liver, kidneys, or the central nervous system. Overexposure by any route may cause nervousness and hyperactivity, headache, nausea, vomiting, unusual sensations, and fatigue. Very severe cases may result in convulsions, coma, or death from respiratory failure. Dicofol is a moderate skin and eye irritant. harmful by inhalation, in contact with skin, and if swallowed, skin irritant, possible inhalation sensitiser,

Potential Health Effects

See section 11 for Chronic exposure studies.

Inhalation

Short term exposure: Available data shows that this product is harmful, but symptoms are not available. However, this product may be irritating, but is unlikely to cause anything more than mild transient discomfort.

Skin Contact:

Short term exposure: Available data shows that this product is harmful, but symptoms are not available. In addition, this product is a skin irritant. Symptoms may include itchiness and reddening of contacted skin. Other symptoms may also become evident, but all should disappear once exposure has ceased.

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: Available data shows that this product is harmful, but symptoms are not available. However, this product may be irritating to mucous membranes but is unlikely to cause anything more than transient discomfort.

Carcinogen Status:

ASCC: No significant ingredient is classified as carcinogenic by ASCC.
NTP: No significant ingredient is classified as carcinogenic by NTP.
IARC: Dicofol is Class 3 - unclassifiable as to carcinogenicity to humans.
Xylene is Class 3 - unclassifiable as to carcinogenicity to humans.

Section 3 - Composition/Information on Ingredients

Ingredients	CAS No	Conc,%	TWA (mg/m^3)	STEL (mg/m^3)
Dicofol	115-32-2	41	not set	not set
Xylene	1330-20-7	45	350	655
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 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: If symptoms of poisoning become evident, contact a Poisons Information Centre, or call a doctor at once. Remove source of contamination or move victim to fresh air. If breathing is difficult, oxygen may be beneficial if administered by trained personnel, preferably on a doctor's advice. DO NOT allow victim to move about unnecessarily. Symptoms of pulmonary oedema can be delayed up to 48 hours after exposure.
Skin Contact: If significant skin contact occurs, 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). Contact a Poisons Information Centre, or call a doctor.
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: If swallowed, do NOT induce vomiting. Wash mouth with water and contact a Poisons Information Centre, or call a doctor.

Section 5 – Fire Fighting Measures

Fire and Explosion Hazards: This product is classified as a flammable liquid. There is a moderate risk of an explosion from this product if commercial quantities are involved in a fire. Any explosion will likely spread the fire to surrounding materials. Water spray may be used to cool drums involved in a fire, reducing the chances of an explosion. 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: Alcohol resistant foam is the preferred firefighting medium but, if it is not available, normal foam can be used. Try to contain spills, minimise spillage entering drains or water courses.
Fire Fighting: If a significant quantity of this product is involved in a fire, call the fire brigade. There is a danger of a violent reaction or explosion if significant quantities of this product are involved in a fire. Recommended personal protective equipment is full fire kit and and breathing apparatus.

Flash point: About 32°C (calculated)
Upper Flammability Limit: 7% (xylene)
Lower Flammability Limit: 1% (xylene)
Autoignition temperature: No data.
Flammability Class: Flammable liquid

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 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. Avoid using sawdust or other combustible material. 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 in a cool, well ventilated area, and make sure that surrounding electrical devices and switches are suitable. Check containers periodically for leaks. Containers should be kept closed in order to minimise contamination and possible evaporation. Make sure that the product does not come into contact with substances listed under "Materials to avoid" in Section 10. If you keep more than 1000L of flammable liquids of Packaging Group III, you probably require a license to do so. If you have any doubts, we suggest you contact your licensing 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**.

Exposure Limits	**TWA (mg/m^3)**	**STEL (mg/m^3)**
Xylene	350	655

The ADI for Dicofol is set at 0.001mg/kg/day. The corresponding NOEL is set at 0.12mg/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: 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.

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.

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

Section 9 - Physical and Chemical Properties:

Physical Description & colour:	Brown mobile liquid.
Odour:	Characteristic xylene odour.
Boiling Point:	Not Available. Xylene Boils About 130°C at 100kPa
Freezing/Melting Point:	No specific data. Liquid at normal temperatures.

Volatiles:	No specific data. Expected to be low at 100°C.
Vapour Pressure:	No data.
Vapour Density:	No data.
Specific Gravity:	0.98 approx
Water Solubility:	Emulsifiable.
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: This product should be kept in a cool place, preferably below 30°C. Containers should be kept dry. Keep away from heat, flames and sparks. Keep away from sources of sparks or ignition. Handle and open containers carefully.
Incompatibilities: oxidising agents.
Fire Decomposition: Carbon dioxide, and if combustion is incomplete, carbon monoxide and smoke. 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 is unlikely to undergo polymerisation processes.

Section 11 – Toxicological Information

Toxicity: **Acute toxicity:** Dicofol is moderately toxic to practically nontoxic and may be absorbed through ingestion, inhalation, or skin contact. Symptoms of exposure include nausea, dizziness, weakness, and vomiting from ingestion or respiratory exposure, skin irritation or rash from dermal exposure, and conjunctivitis from eye contact. Poisoning may affect the liver, kidneys, or the central nervous system. Overexposure by any route may cause nervousness and hyperactivity, headache, nausea, vomiting, unusual sensations, and fatigue. Very severe cases may result in convulsions, coma, or death from respiratory failure. Dicofol is a moderate skin and eye irritant. Since Dicofol is stored in fatty tissues, intense activity or starvation may mobilize the pesticide, resulting in the reappearance of toxic symptoms long after actual exposure. The oral LD_{50} for Dicofol in rats is 575 to 960 mg/kg, in rabbits and guinea pigs is 1810 mg/kg, and in mice is 420 to 675 mg/kg. The dermal LD_{50} in rats is 1000 to 5000 mg/kg, and in rabbits is between 2000 and 5000 mg/kg. The inhalation LC_{50} (4-hour) in rats is greater than 5 mg/L.
Chronic toxicity: In a 2-year dietary study with rats, liver growth, enzyme induction, and other changes in the liver, adrenal gland, and urinary bladder were observed at doses of 2.5 mg/kg/day and above. Effects on the liver, kidney, and adrenals, and reduced body weights were observed at doses of 6.25 mg/kg/day and above in a 3-month dietary study with mice. When Dicofol was fed to rats for 3 months, fewer than half of the animals survived a 75 mg/kg/day dose. Liver enzyme induction was observed at 75 mg/kg/day and above. Decreased body weights, decreased cortisone levels, and toxic changes in the liver, adrenal glands, and kidneys were noted at 25 mg/kg/day. Similar results were observed in a 3-month feeding study with mice. When dogs were fed Dicofol for 3 months, 2 two out of 12 survived at 25 mg/kg/day. Poisoning symptoms and effects on the liver, heart, and testes were observed at the 7.5 mg/kg/day dose. When Dicofol was fed to dogs, 4.5 mg/kg/day for 1 year caused toxic effects on the liver. Long-term dermal exposure of rats to Dicofol as an emulsifiable concentrate formulation also produced toxic effects on the liver.
Reproductive effects: Reproductive effects in rat offspring have been observed only at doses high enough to also cause toxic effects on the livers, ovaries, and feeding behavior of the parents. Rats fed diets containing Dicofol through two generations exhibited adverse effects on the survival and/or growth of newborns at 6.25 and 12.5 mg/kg/day.
Teratogenic effects: No teratogenic effects were observed when rats were given up to 25 mg/kg/day on days 6 through 15 of pregnancy.
Mutagenic effects: Five separate laboratory tests have shown that Dicofol is not mutagenic.
Carcinogenic effects: No evidence of carcinogenicity was observed in when rats were fed up to 47 mg/kg/day for 78 weeks. A 2-year oncogenicity study in mice showed an increased incidence of liver tumors in male mice at dietary concentration levels of 13.2 and 26.4 mg/kg/day. It is unlikely that Dicofol poses a carcinogenic risk to humans.
Organ toxicity: Chronic exposure to Dicofol can cause damage to the kidney, liver, and heart. Prolonged or repeated exposure to Dicofol can cause the same effects and symptoms as acute exposure. Prolonged or repeated skin contact can cause moderate skin irritation and/or sensitization of the skin.

Fate in humans and animals: Dicofol is converted in rats to the metabolites 4,4'-dichloro-benzophenone and 4,4'-dichlorodicofol. Studies of the metabolism of Dicofol in rats, mice, and rabbits have shown that ingested Dicofol is rapidly absorbed, distributed primarily to fat, and readily eliminated in faeces. When mice were given a single oral dose of 25 mg/kg Dicofol, approximately 60% of the dose was eliminated within 96 hours, 20% in the urine, and 40% in the faeces. Concentrations in body tissues peaked between 24 and 48 hours following dosing, with 10% of the dose found in fat, followed by the liver and other tissues. Levels in tissues other than fat declined sharply after the peak. When rats were given a single oral dose of 50 mg/kg of Dicofol, all but 2% of the dose was eliminated within 192 hours, with peak concentrations in body tissues occurring between 24 and 48 hours after dosing.

Section 12 – Ecological Information

Effects on birds: Dicofol is slightly toxic to birds. The 8-day dietary LC_{50} is 3010 ppm in bobwhite quail, 1418 ppm in Japanese quail, and 2126 ppm in ring-necked pheasant. Eggshell thinning and reduced offspring survival were noted in the mallard duck, American kestrel, ring dove, and screech owl.
Effects on aquatic organisms: Dicofol is highly toxic to fish, aquatic invertebrates, and algae. The LC_{50} is 0.12 mg/L in rainbow trout, 0.37 mg/L in sheepshead minnow, 0.06 mg/L in mysid shrimp, 0.015 mg/L in shell oysters, and 0.075 mg/L in algae.
Effects on other organisms: Dicofol is not toxic to bees.
Environmental Fate:
Breakdown in soil and groundwater: Dicofol is moderately persistent in soil, with a half-life of 60 days. Dicofol is susceptible to chemical breakdown in moist soils. It is also subject to degradation by UV light. In a silty loam soil, its photodegradation half-life was 30 days. Under anaerobic soil conditions, the half-life for Dicofol was 15.9 days. Dicofol is practically insoluble in water and adsorbs very strongly to soil particles. It is therefore nearly immobile in soils and unlikely to infiltrate groundwater. Even in sandy soil, Dicofol was not detected below the top 3 inches in standard soil column tests. It is possible for Dicofol to enter surface waters when soil erosion occurs.
Breakdown in water: Dicofol degrades in water or when exposed to UV light at pH levels above 7. Its half-life in solution at pH 5 is 47 to 85 days. Because of its very high absorption coefficient (Koc), Dicofol is expected to adsorb to sediment when released into open waters.
Breakdown in vegetation: In a number of studies, Dicofol residues on treated plant tissues have been shown to remain unchanged for up to 2 years.

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. 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: 1993, FLAMMABLE LIQUID, N.O.S.
Hazchem Code: 3Y
Special Provisions: 223, 274
Limited quantities: ADG 7 specifies a Limited Quantity value of 5 L for this class of product.
Packaging Group: III
Packaging Method: P001, IBC03, LP01

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

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, 7th Edition
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
ASCC	Office of the Australian Safety and Compensation Council
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)9431 7800 **Fax: (02)9431 7700 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.

http://www.kilford.com.au/ Phone (02)9251 4532