

Section 1 - Identification of Chemical Product and Company

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Substance: Dimethoate is an organophosphorus derivative.
Trade Name: Farmoz Dimethoate 400 Systemic Insecticide
Product Use: Agricultural insecticide for use as described on the product label.
Creation Date: **November, 2002**
This version issued: **April, 2009**

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, R20, R36, R24/25. Flammable. Harmful by inhalation. Irritating to eyes. Toxic in contact with skin and if swallowed.

Safety Phrases: S16, S20, S25, S36, S38. Keep away from sources of ignition - No smoking. When using, do not eat or drink. Avoid contact with eyes. Wear suitable protective clothing. In case of insufficient ventilation, wear suitable respiratory equipment.

SUSDP Classification: S6

ADG Classification: Class 6.1, Sub risk 3 (ORGANOPHOSPHORUS PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flash point not less than 23°C)

UN Number: 3017

Emergency Overview

Physical Description & colour: Colourless to yellow liquid.

Odour: Mercaptan-like sulfurous odour.

Major Health Hazards: Symptoms of acute exposure to organophosphate or cholinesterase-inhibiting compounds may include the following: numbness, tingling sensations, incoordination, headache, dizziness, tremor, nausea, abdominal cramps, sweating, blurred vision, difficulty breathing or respiratory depression, and slow heartbeat. Very high doses may result in unconsciousness, incontinence, and convulsions or fatality. Persons with respiratory ailments, recent exposure to cholinesterase inhibitors, impaired cholinesterase production, or liver malfunction may be at increased risk from exposure to Dimethoate. High environmental temperatures or exposure of Dimethoate to visible or UV light may enhance its toxicity. This product is a cumulative poison. Minor exposures over a period of time may lead to serious health problems.

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: Available data shows that this product is not harmful. However 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: Cyclohexanone 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)
Dimethoate	60-51-5	40	not set	not set
Cyclohexanone	108-94-1	12	100	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 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.

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.

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: No specific health data is available for this product. If any unusual symptoms become evident, or if in doubt, contact a Poisons Information Centre or a doctor.

Eye Contact: Quickly and gently blot or brush away product. Immediately flush the contaminated eye(s) with lukewarm, gently flowing water until the product is removed or until a few minutes after irritation has ceased, while holding the eyelid(s) open. Take care not to rinse contaminated water into the unaffected eye or onto the face.

Ingestion: If swallowed, rinse mouth thoroughly with water and contact a Poisons Information Centre, or call a doctor at once. Give activated charcoal if instructed.

Section 5 – Fire Fighting Measures

Fire and Explosion Hazards: This product is classified as a flammable product. 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: 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 liquid-tight chemical protective clothing and breathing apparatus.

Flash point: 39°C

Upper Flammability Limit: No data.

Lower Flammability Limit: No data.

Autoignition temperature: No data.

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 face mask, face shield, gauntlets and self contained breathing

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apparatus. See below under Personal Protection regarding Australian Standards relating to personal protective equipment. No special recommendations for clothing materials. 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. 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. 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 "Materials to avoid" 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 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**.

ASCC Exposure Limits	TWA (mg/m ³)	STEL (mg/m ³)
Cyclohexanone	100	not set

The ADI for Dimethoate is set at 0.02mg/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 2008.

Ventilation: This product should only be used in a well ventilated area. If natural ventilation is inadequate, use of a fan is suggested.

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: It is essential that all skin areas are adequately covered by impermeable gloves, overalls, hair covering, apron and face shield. See below for suitable material types.

Protective Material Types: We suggest that protective clothing be made from the following materials: 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.

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:	Colourless to yellow liquid.
Odour:	Mercaptan-like sulfurous odour.
Boiling Point:	Not available.
Freezing/Melting Point:	No specific data. Liquid at normal temperatures.
Volatiles:	No data.
Vapour Pressure:	No data.
Vapour Density:	No data.
Specific Gravity:	Approx 1.1

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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.

Incompatibilities: strong acids, 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. Oxides of sulfur (sulfur dioxide is a respiratory hazard) and other sulfur compounds. Most will have a foul odour. Oxides of phosphorus and other phosphorus compounds. 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: Dimethoate is toxic by ingestion, inhalation, and dermal absorption. The reported acute oral LD₅₀ values for the technical product range from 180 to 330 mg/kg in the rat. Reported oral LD₅₀ values in other species are 160 mg/kg in mice and 400 to 500 mg/kg in rabbits. In guinea pigs, the oral toxicity is reported as 550 to 600 mg/kg for the pure and laboratory grade of the compound, but for the technical grade is only 350 to 400 mg/kg. It is not clear whether the increased toxicity results from impurities present initially in the technical product or whether these may be formed from degradation over time. Reported dermal LD₅₀ values for Dimethoate are 100 to 600 mg/kg in rats, again with a much lower value for an earlier product. Dimethoate is reportedly not irritating to the skin and eyes of lab animals. Severe eye irritation has occurred in workers manufacturing Dimethoate, although this may be due to impurities. Via the inhalation route, the reported 4-hour LC₅₀ is greater than 2.0 mg/L, indicating slight toxicity. Effects of acute exposure are those typical of organophosphates. Symptoms of acute exposure to organophosphate or cholinesterase-inhibiting compounds may include the following: numbness, tingling sensations, incoordination, headache, dizziness, tremor, nausea, abdominal cramps, sweating, blurred vision, difficulty breathing or respiratory depression, and slow heartbeat. Very high doses may result in unconsciousness, incontinence, and convulsions or fatality. Persons with respiratory ailments, recent exposure to cholinesterase inhibitors, impaired cholinesterase production, or liver malfunction may be at increased risk from exposure to Dimethoate. High environmental temperatures or exposure of Dimethoate to visible or UV light may enhance its toxicity.

Chronic toxicity: There was no cholinesterase inhibition in an adult human who ingested 18 mg (about 0.26 mg/kg/day) of Dimethoate/day for 21 days. No toxic effects and no cholinesterase inhibition were observed in individuals who ingested 2.5 mg/day (about 0.04 mg/kg/day) for 4 weeks. In another study with humans given oral doses of 5, 15, 30, 45 or 60 mg/day for 57 days, cholinesterase inhibition was observed only in the 30 mg/day and higher dosage groups. Repeated or prolonged exposure to organophosphates may result in the same effects as acute exposure, including the delayed symptoms. Other effects reported in workers repeatedly exposed include impaired memory and concentration, disorientation, severe depression, irritability, confusion, headache, speech difficulties, delayed reaction times, nightmares, sleepwalking, and drowsiness or insomnia. An influenza-like condition with headache, nausea, weakness, loss of appetite, and malaise has also been reported.

Reproductive effects: When mice were given 9.5 to 10.5 mg/kg/day Dimethoate in their drinking water, there was decreased reproduction, pup survival, and growth rates of surviving pups. Adults in this study exhibited reduced weight gain, but their survival was not affected. In a three-generation study with mice, 2.5 mg/kg/day did not decrease reproductive performance or pup survival. Once in the bloodstream, Dimethoate may cross the placenta. Impaired reproductive function in humans is not likely under normal conditions.

Teratogenic effects: Dimethoate is teratogenic in cats and rats. A dosage of 12 mg/kg/day given to pregnant cats increased the incidence of extra toes on kittens. The same dosage given to pregnant rats produced birth defects related to bone formation, runting and malfunction of the bladder. Dosages of 3 or 6 mg/kg/day were not teratogenic in cats or rats. No effects were observed in cats and rats at doses of 2.8 mg/kg/day. There were no teratogenic effects

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seen in the offspring of mice given 9.5 to 10.5 mg/kg/day Dimethoate in their drinking water. It is not likely that teratogenic effects will be seen in humans under normal circumstances.

Mutagenic effects: Mutagenic effects due to Dimethoate exposure were seen in mice. They were more prominent in male mice given a single high dose of Dimethoate than in male mice given one twelfth of the same dose daily for 30 days. Mutagenic effects are unlikely in humans under normal circumstances.

Carcinogenic effects: An increase in malignant tumors was reported in rats given oral doses of 5, 15 or 30 mg/kg/day Dimethoate for over a year. The increases were not, however, dose dependent. That is, higher doses did not necessarily result in higher tumor rates. Thus the evidence of carcinogenicity, even with high-dose, long-term exposure, is inconclusive. This suggests carcinogenic effects in humans are unlikely.

Organ toxicity: Target organs as determined through animal tests include the testicles, kidneys, liver, and spleen.

Fate in humans and animals: Dimethoate is rapidly metabolized by mammals. Rats excreted about 50 to 60% of administered doses in urine, expired air and faeces within 24 hours. Human volunteers excreted 76 to 100% of administered Dimethoate within 24 hours. The rate of metabolism and elimination varied in several species tested. Amongst several mammalian species tested, Dimethoate appears to be less toxic to those animals with higher liver-to-body weight ratios and to those with the highest rate of Dimethoate metabolism. Following application of Dimethoate to the backs of cows at 30 mg/kg, the concentration of Dimethoate reached a maximum level of 0.02 ppm in blood and milk in about 3 hours, and decreased to 0.01 ppm within 9 hours.

Section 12 – Ecological Information

Effects on birds: Dimethoate is moderately to very highly toxic to birds. In Japanese quail, a 5-day dietary LC₅₀ of 341 ppm is reported. It may be very highly toxic to other birds; reported acute oral LD₅₀ values are 41.7 to 63.5 mg/kg in mallards and 20.0 mg/kg in pheasants. Birds are not able to metabolize Dimethoate as rapidly as mammals do, which may account for its relatively higher toxicity in these species.

Effects on aquatic organisms: Dimethoate is moderately toxic to fish, with reported LC₅₀ values of 6.2 mg/L in rainbow trout, and 6.0 mg/L in bluegill sunfish. It is more toxic to aquatic invertebrate species such as stoneflies and scuds.

Effects on other organisms: Dimethoate is highly toxic to honeybees. The 24-hour topical LD₅₀ for Dimethoate in bees is 0.12 µg per bee.

Environmental Fate:

Breakdown in soil and groundwater: Dimethoate is of low persistence in the soil environment. Soil half-lives of 4 to 16 days, or as high as 122 days have been reported, but a representative value may be on the order of 20 days. Because it is rapidly broken down by soil microorganisms, it will be broken down faster in moist soils. Dimethoate is highly soluble in water, and it adsorbs only very weakly to soil particles so it may be subject to considerable leaching. However, it is degraded by hydrolysis, especially in alkaline soils, and evaporates from dry soil surfaces. Losses due to evaporation of 23 to 40% of applied Dimethoate have been reported. Biodegradation may be significant, with a 77% loss reported in a nonsterile clay loam soil after 2 weeks.

Breakdown in water: In water, Dimethoate is not expected to adsorb to sediments or suspended particles, nor to bioaccumulate in aquatic organisms. It is subject to significant hydrolysis, especially in alkaline waters. The half-life for Dimethoate in raw river water was 8 days, with disappearance possibly due to microbial action or chemical degradation. Photolysis and evaporation from open waters are not expected to be significant.

Breakdown in vegetation: Dimethoate is not toxic to plants.

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: 3017, ORGANOPHOSPHORUS PESTICIDE, LIQUID, TOXIC, FLAMMABLE

Hazchem Code: 3W

Special Provisions: 61, 223, 274

Limited quantities: ADG 7 specifies a Limited Quantity value of 5 L for this class of product.

Dangerous Goods Class: Class 6.1, Toxic Substances.

Sub risk: Class 3, flammable liquid.

Packaging Group: III

Packaging Method: P001, IBC03

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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)

Section 15 – Regulatory Information

AICS: All of the significant ingredients in this formulation are to be found in the public AICS Database. The following ingredient: dimethoate is mentioned in the SUSDP.

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 Code	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 and ask for the technical manager.

Fax: (02)9431 7700

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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