

Section 1 - Identification of Chemical Product and Company

Statement of Hazardous Nature

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

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

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Substance: Methomyl is an oxime carbamate derivative.
Trade Name: Farnoz Electra 225 Insecticide
Product Use: Agricultural insecticide 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)
Methomyl	16752-77-5	22.5	2.5	not set
Methanol	67-56-1	13	262	328
Cyclohexanone	108-94-1	35	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 3 - Hazards Identification

Risk Phrases: R11, R20, R28, R24/25, R36/37/38. Highly flammable. Harmful by inhalation. Very toxic if swallowed. Toxic in contact with skin and if swallowed. Irritating to eyes, respiratory system and skin.

Safety Phrases: S2, S20, S29, S33, S36, S38, S44, S24/25. Keep out of reach of children. When using, do not eat or drink. Do not empty into drains. Take precautionary measures against static discharges. Wear suitable protective clothing. In case of insufficient ventilation, wear suitable respiratory equipment. If you feel unwell, contact a doctor or Poisons Information Centre immediately (show the label where possible). Avoid contact with skin and eyes.

SUSDP Classification: S7

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

UN Number: 2758

Emergency Overview

Physical Description & colour: Clear amber coloured liquid.

Odour: Characteristic odour.

Major Health Hazards: Symptoms of Methomyl exposure are similar to those caused by other carbamates and cholinesterase inhibitors. These may include weakness, blurred vision, headache, nausea, abdominal cramps, chest discomfort, constriction of pupils, sweating, muscle tremors, and decreased pulse. If there is severe poisoning, symptoms of twitching, giddiness, confusion, muscle incoordination, slurred speech, low blood pressure, heart irregularities, and loss of reflexes may also be experienced.

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.

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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: Symptoms are described fully above.

Carcinogen Status:

NOHSC: No significant ingredient is classified as carcinogenic by NOHSC.

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

IARC: Cyclohexanone is Class 3 - unclassifiable as to carcinogenicity 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 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.

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: 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. See instructions above about treatment with atropine.

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 at once. See instructions above about treatment with atropine.

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, 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 a C1 combustible 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. 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.

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.

Fire Fighting: When fighting fires involving significant quantities of this product, wear a fully encapsulated splash suit complete with self contained breathing apparatus.

Flash point: Not available

Upper Flammability Limit: No data.

Lower Flammability Limit: No data.

Autoignition temperature: No data.

Flammability Class: C1

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

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protective chemically resistant clothing including face mask, face shield, gauntlets and self contained breathing apparatus. See above under Personal Protection regarding Australian Standards relating to personal protective equipment. Suitable materials for protective clothing include rubber, Viton. 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. 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, 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 100L of flammable liquids of Packaging Groups I and or II, 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)
Methomyl	2.5	not set
Methanol	262	328
Cyclohexanone	100	not set

The ADI for Methomyl is set at 0.01mg/kg/day. The corresponding NOEL is set at 1.25mg/kg/day. ADI means Acceptable Daily Intake and NOEL means No-observable-effect-level. Values taken from Australian ADI List, January 2001.

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: rubber, Viton.

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 MB cartridge, suitable for methyl bromide.

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:	Clear amber coloured liquid.
Odour:	Characteristic odour.
Boiling Point:	Not available.
Freezing/Melting Point:	No specific data. Liquid at normal temperatures.

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Volatiles:	Methanol content.
Vapour Pressure:	No data.
Vapour Density:	No data.
Specific Gravity:	No data. Expected to be close to 1.0
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. 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. Nitrogen and its compounds, and under some circumstances, oxides of nitrogen. Occasionally hydrogen cyanide gas. 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

Acute toxicity: Methomyl is highly toxic orally, with reported oral LD₅₀ values of 17 to 24 mg/kg in rats, 10 mg/kg in mice, and 15 mg/kg in guinea pigs. Symptoms of Methomyl exposure are similar to those caused by other carbamates and cholinesterase inhibitors. These may include weakness, blurred vision, headache, nausea, abdominal cramps, chest discomfort, constriction of pupils, sweating, muscle tremors, and decreased pulse. If there is severe poisoning, symptoms of twitching, giddiness, confusion, muscle incoordination, slurred speech, low blood pressure, heart irregularities, and loss of reflexes may also be experienced. Death can result from discontinued breathing, paralysis of muscles of the respiratory system, intense constriction of the openings of the lung, or all three. It is moderately toxic via inhalation with a reported 4-hour inhalation LC₅₀ in male rats of 0.3 mg/L. Inhalation of dust or aerosol may cause irritation, lung and eye problems, with symptoms of chest tightness, blurred vision, tearing, wheezing, and headaches appearing upon exposure. Other systemic symptoms of cholinesterase inhibition may appear within a few minutes to several hours of exposure. It is slightly toxic via the dermal route, with a reported dermal LD₅₀ of 5880 mg/kg in rabbits, and is absorbed only slowly through the skin. However, if sufficient amounts are absorbed through the skin, symptoms similar to those induced by ingestion or inhalation will develop. Within fifteen minutes to four hours of exposure, the immediate area of contact may show localized sweating and uncoordinated muscular contractions. In rabbits, application of Methomyl resulted in mild eye irritation. Pain, short-sightedness, blurring of distant vision, tearing, and other eye disturbances may occur within a few minutes of eye contact with Methomyl.

Chronic toxicity: Prolonged or repeated exposure to Methomyl may cause symptoms similar to the pesticide's acute effects. Repeated exposure to small amounts of Methomyl may cause an unsuspected inhibition of cholinesterase, resulting in flu-like symptoms, such as weakness, lack of appetite, and muscle aches. Cholinesterase-inhibition may persist for two to six weeks. This condition is reversible if exposure is discontinued. Since cholinesterase is increasingly inhibited with each exposure, severe cholinesterase-inhibition symptoms may be produced in a person who has had previous Methomyl exposure, while a person without previous exposure may not experience any symptoms at all. In a 24-month study with rats fed doses of 2.5, 5 or 20 mg/kg/day, effects were only observed at the highest dose tested, 20 mg/kg/day. At this very high dose, red blood cell counts and hemoglobin levels were significantly reduced in female rats. In a 2-year feeding study with dogs, 5 mg/kg/day caused no observed adverse effects. It is not likely that chronic effects would be seen in humans unless exposures were unexpectedly high, as with chronic misuse.

Reproductive effects: Methomyl fed to rats at dietary doses of 2.5 or 5 mg/kg for three generations caused no adverse effect on reproduction, nor was there any evidence of congenital abnormalities. No fetotoxicity was observed in offspring of pregnant rats given 33.9 mg/kg/day on day 6 to 21 of gestation. Based on these data it appears unlikely that Methomyl will have reproductive effects.

Teratogenic effects: No teratogenic effects were found in the foetuses of female rabbits that were fed approximately 15 to 30 mg/kg/day during the 8th to 16th day of gestation. In rats, no embryonic or teratogenic effects were observed

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at the highest dietary dose administered, approximately 34 mg/kg/day. Thus, Methomyl does not appear to be teratogenic.

Mutagenic effects: In a number of assays (including Ames test, a reverse mutation assay, a recessive lethal assay, three DNA damage studies, an unscheduled DNA synthesis assay, and in vivo and in vitro cytogenetic assays), Methomyl was not mutagenic. There is no evidence that Methomyl is a mutagenic or genotoxic.

Carcinogenic effects: There was no evidence of carcinogenicity in either rats or dogs that ingested high doses of Methomyl in 2-year feeding studies. Methomyl was not carcinogenic in 22- and 24-month studies with rats fed doses of up to 20 mg/kg, nor in a two-year study with mice fed dietary doses of up to 93.4 mg/kg/day. The evidence suggests that Methomyl is not carcinogenic.

Organ toxicity: Lungs, skin, eyes, gastrointestinal tract, kidneys, spleen, and blood-forming organs have been affected in various experiments, depending on route of entry, duration of exposure, and dosage.

Fate in humans and animals: Methomyl is quickly absorbed through the skin, lungs, and gastrointestinal tract and are broken down in the liver. Breakdown products are readily excreted via respiration and urine. Although they do not appear to accumulate in any particular body tissue, they may alter many other enzymes besides the cholinesterases.

Classification of Hazardous Ingredients

Ingredient	Risk Phrases
Methomyl	Conc≥7%: T+; R28
Methanol	≥3%Conc≤20%: Xn; R20/22
Cyclohexanone	Conc≥25%: Xn; R20

Section 12 – Ecological Information

Effects on birds: Methomyl is highly toxic to birds. The acute oral LD₅₀ in bobwhite quail is 24.2 mg/kg. The oral LD₅₀ of Methomyl is 28 mg/kg in hens. All deaths occurred within ten minutes of dosing. The clinical signs of toxicity included tearing of the eyes, salivation, occasional convulsions, and respiratory disorders. In Japanese quail, the LD₅₀ is 34 mg/kg. The LD₅₀ of a 90% pure formulation is 15.9 mg/kg in eight-month-old mallards, and 15.4 mg/kg in three- to four-month-old male pheasants. The LD₅₀ for starlings is 42 mg/kg and for red winged blackbirds is 10 mg/kg.

Effects on aquatic organisms: Methomyl is moderately to highly toxic to fish and highly toxic to aquatic invertebrates. The 96-hour LC₅₀ in rainbow trout for a liquid formulation of Methomyl is 3.4 mg/L and for bluegill sunfish is 0.8 mg/L. The 48-hour LC₅₀ for Daphnia magna (a small, freshwater crustacean) is 0.0287 mg/L. A 28-day fish residue study indicated that Methomyl did not accumulate in fish tissue. Methomyl is unlikely to bioconcentrate in aquatic systems.

Effects on other organisms: Methomyl is highly toxic to bees both by direct contact and through ingestion. The LD₅₀ for a 90% pure formulation of Methomyl is 11.0 to 22.0 mg/kg in mule deer. Symptoms of acute poisoning in these animals included drowsiness, drooling, diarrhoea, and tremors.

Environmental Fate:

Breakdown in soil and groundwater: Methomyl has low persistence in the soil environment, with a reported half-life of approximately 14 days. Because of its high solubility in water, and low affinity for soil binding Methomyl may have potential for groundwater contamination. It is very mobile in sandy loam and silty clay loam soils, but only slight leaching was observed in a silt loam and in a sandy soil. Methomyl is rapidly degraded by soil microbes. Methomyl residues are not expected to be found in treated soil after the growing season in which it is applied.

Breakdown in water: Aqueous solutions of Methomyl have been reported to decompose more rapidly on aeration, in sunlight, or in alkaline media. The estimated aqueous half-life for the insecticide is 6 days in surface water and over 25 weeks in groundwater. In one experiment, the hydrolysis half-lives of Methomyl in solutions at pHs of 6.0, 7.0 and 8.0 were 54, 38, and 20 weeks respectively. In pure water, the hydrolysis half-life has been estimated to be 262 days.

Breakdown in vegetation: Following soil treatment, plants take up Methomyl through their roots and move it throughout the plant by a process called "translocation." When Methomyl is applied to plants, its residues are short-lived. After it is applied to leaves, it has a 3 to 5 day half-life. Less than 3% Methomyl remained in cabbage plants 1 week after they were given foliar treatment with the insecticide.

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: 2758, CARBAMATE PESTICIDE, LIQUID, FLAMMABLE, TOXIC

Hazchem Code: 3WE

Special Provisions: SP61, SP109

Packaging Group: II

Packaging Method: 3.8.3

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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
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:
Emergency contact:

Dial 000
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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