

MATERIAL SAFETY DATA SHEET



Date of Issue: August 18th 2010

1. IDENTIFICATION OF MATERIAL AND SUPPLIER

Product name **Nemacur® 400 Nematicide Liquid**

Other names None

Product code and pack sizes 4953680 (5 L), 4953672 (20 L), 4953699 (50 L),

Chemical group Organophosphorus

Recommended use Agricultural nematicide

Formulation Emulsifiable concentrate

Supplier Bayer CropScience Pty Ltd ABN 87 000 226 022

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2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

HAZARDOUS SUBSTANCE (see Risk phrases below) - DANGEROUS GOOD
Very poisonous. Cholinesterase inhibitor. Toxic to fish and wildlife. Combustible liquid.

Hazard classification Hazardous (National Occupational Health and Safety Commission - NOHSC)

Risk phrases R26/28 – Very toxic by inhalation and if swallowed.
R24 – Toxic in contact with skin.
R65 - Harmful: May cause lung damage if swallowed.

Safety phrases See Sections 4, 5, 6, 7, 8, 9, 13

ADG classification “Dangerous good” for transport by road or rail according to the Australian Code for the Transport of Dangerous Goods by Road and Rail – ORGANOPHOSPHORUS PESTICIDE, LIQUID, TOXIC (contains fenamiphos), Division 6.1, Packing Group II, UN 3018.

SUSDP classification (Poisons Schedule) Schedule 7 (Standard for the Uniform Scheduling of Drugs and Poisons)

3. COMPOSITION / INFORMATION ON INGREDIENTS

Ingredients	CAS Number	Concentration (g/L)
Fenamiphos	[22224-92-6]	400
Solvent naphtha (petroleum), heavy aromatic	[64742-94-5]	227
Naphthalene (in Solvent naphtha (petroleum), heavy aromatic)	[91-20-3]	< 23
Propane-1,2-diol	57-55-6	178
Other ingredients, non hazardous	---	245

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4. FIRST AID MEASURES

If poisoning occurs, immediately contact a doctor or Poisons Information Centre (telephone 13 11 26), and follow the advice given. Show this Material Safety Data Sheet to the doctor.

Inhalation	If inhaled, remove to fresh air and keep at rest. Obtain urgent medical advice. If breathing stops or shows signs of failing, start artificial respiration. If advised by doctor or Poisons Information Centre, atropine tablets may be administered.
Skin contact	Immediately remove contaminated clothing. Wash skin with soap and water. Seek medical attention immediately. Persons assisting the patient should protect themselves from contamination. If advised by doctor or Poisons Information Centre, atropine tablets may be administered.
Eye contact	Rinse eyes immediately with clean water for at least 15 minutes and obtain urgent medical aid, preferably from an eye specialist.
Ingestion	Wash out mouth with water. DO NOT induce vomiting. Give a glass of water. Keep patient at rest and seek urgent medical advice as above. Transport patient to doctor or hospital quickly. If advised by doctor or Poisons Information Centre, atropine tablets may be administered. DO NOT attempt to give anything by mouth to a semi-conscious or unconscious person.
First Aid Facilities	Provide eyewash and safety shower facilities in the workplace.
Medical attention	Nemacur 400 contains fenamiphos, which is an organophosphorus compound, and as such it is a cholinesterase inhibitor. <u>Symptoms of poisoning due to cholinesterase inhibition</u> Mild intoxication causes headache, blurred vision, weakness, sweating, mild chest pain, nausea and vomiting. Severe intoxication causes cyanosis (blueness of the skin, as from lack of oxygen), muscular twitching, spasms, miosis (pinpoint pupils) and respiratory paralysis. Onset of symptoms may be delayed. Cholinesterase inhibition sometimes persists for several weeks. <u>Symptoms of exposure to the solvent</u> Headache, dizziness, anaesthesia and other central nervous system effects, skin dryness or cracking from repeated exposure. <u>Treatment</u> Basic aid, decontamination, symptomatic treatment and if necessary administration of antidote. Antidote: Atropine sulphate. In severe cases pralidoxime may be administered as well, if given within 24 hours after exposure. Atropine should not be given to a cyanosed patient. Against convulsions: Diazepam. Monitor respiratory, cardiac and central nervous system function. Monitor red blood cell and plasma cholinesterase levels. Administer oxygen if necessary. Watch for pulmonary oedema and delayed neurological symptoms. As this product contains a hydrocarbon liquid, care should be taken to prevent pulmonary aspiration. Small amounts of liquid aspirated into the respiratory system during ingestion or from vomiting may cause bronchopneumonia or pulmonary oedema. <u>Contraindications</u> Adrenergic derivatives. Never give patient morphine, theophylline or theophylline-ethylenediamine. Large amounts of intravenous fluids are generally contraindicated because of the threat of pulmonary oedema.

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5. FIRE FIGHTING MEASURES

Extinguishing media Waterspray, foam, dry chemical, carbon dioxide, sand.

Hazards from combustion products In a fire, hydrogen cyanide, carbon monoxide, oxides of phosphorus, sulphur oxides and nitrogen oxides may be formed.

Precautions for fire fighters The product is a Class C1 Combustible liquid. Fire fighters should wear full protective gear, including self-contained breathing apparatus (AS/NZS 1715/1716). Keep unnecessary people away and move all other personnel to windward side of fire. Isolate hazard area and deny entry. Consider evacuation, taking all relevant factors into account. In case of doubt, evacuate immediate vicinity and request emergency services assistance. Use water spray to cool fire-exposed containers. Bund area with sand or earth to prevent contamination of drains or waterways. Dispose of fire control water or other extinguishing agent and spillage safely later.

Hazchem code 2X

6. ACCIDENTAL RELEASE MEASURES

Avoid contact with the spilled material or contaminated surfaces. Extinguish or remove possible sources of ignition. Do not smoke, eat or drink during the cleanup process. Personnel involved in cleanup should wear full body protective clothing and equipment as described in Section 8 – PERSONAL PROTECTION. Keep people and animals away. Consider evacuation and obtain assistance from emergency services if needed. Prevent spilled material from entering drains or watercourses. Contain spill and absorb with earth, sand, clay, or other absorbent material. Collect and store in recovery drums. Clean floor with detergent and water, absorbing wash water with absorbent material and transfer this to the drum. Seal and label drums for safe disposal. Thoroughly ventilate the area after cleanup. Deal with all spillages immediately. If contamination of drains, streams, watercourses, etc. is unavoidable, warn the local water authority. Decontaminate tools, equipment and clothing used in the cleanup. Dispose of any heavily soiled clothing, placing it in disposal drum.

7. HANDLING AND STORAGE

Handling Keep out of reach of children. Very dangerous. Poisonous if absorbed by skin contact, inhaled or swallowed. Repeated minor exposures may have a cumulative poisoning effect. Avoid contact with eyes and skin. Do not inhale spray mist. Obtain an emergency supply of atropine tablets 0.6 mg. If product on skin, immediately wash area with soap and water. After use and before eating, drinking or smoking, wash hands, arms and face thoroughly with soap and water. After each day's use, wash gloves, respirator and contaminated clothing with detergent and warm water.

Storage Store in the closed, original container in a cool, well-ventilated area. Do not store for prolonged periods in direct sunlight. Store in a locked room or place away from children, animals, food, feedstuffs, seed and fertilisers.

Flammability Combustible liquid, Class C1 - flashpoint greater than 60° C and less than 150° C.

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8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure standards NOHSC Exposure standard for fenamiphos: TWA: 0.1 mg/m³. Skin notation. The manufacturer of the solvent recommends an Occupational Exposure Limit for solvent naphtha (petroleum), heavy aromatic: TWA: 100 mg/m³ (17 ppm). For the small amount of naphthalene present in the solvent the NOHSC Occupational Exposure Limits are: TWA: 10 ppm (52 mg/m³, STEL: 15 ppm (79 mg/m³). Skin notation.
NOHSC Occupational Exposure Limits for:
Propane-1,2-diol (particulates only): TWA: 10 mg/m³
Propane-1,2-diol total (vapour and particulates): TWA: 150 ppm (474 mg/m³)

Definitions

Exposure standard – Time Weighted Average (TWA) means the average airborne concentration of a particular substance when calculated over a normal eight-hour working day, for a five-day working week.

Exposure standard – Short term exposure limit (STEL) means a 15 minute TWA exposure which should not be exceeded at any time during the working day.

Skin notation – Absorption through the skin may be a significant source of exposure.

Biological limit values Production workers and agricultural workers handling this product should be monitored for cholinesterase levels. A baseline level should be established prior to any potential exposure. See Guidelines for Health Surveillance [NOHSC:7039(1995)]

Engineering controls Control process conditions to avoid contact. Use local exhaust ventilation while handling. Use this product in a well-ventilated area only.

Personal Protective Equipment Product is very dangerous – poisonous if absorbed by skin contact, inhaled or swallowed.

- Wear full-face respirator with combined dust and gas cartridge - AS/NZS 1715/1716 approved. In enclosed spaces a respirator or hood with an independent air supply should be worn.
- Wear cotton overalls buttoned to the neck and wrist, a washable hat and impervious footwear.
- Wear elbow-length PVC gloves.
- Keep working clothes separate. Remove soiled clothing immediately and wash separately from other laundry.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Clear yellow solution
Odour: Aromatic, chemical
pH: 5.0 to 6.0 (1% in water)
Vapour pressure: 1.2 x 10⁻⁶ hPa at 20° C (fenamiphos); 0.3 kPa (at 38° C) – hydrocarbon solvent
Vapour density: > 1.00 – hydrocarbon solvent
Boiling point: Not available
Freezing/melting point: Not available
Solubility: Emulsifies in water
Specific gravity: 1.05 at 20° C
Flash Point: > 70° C
Flammability (explosive) limits: LEL: 0.6; UEL: 7.0 Vol. % in air (hydrocarbon solvent)

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9. PHYSICAL AND CHEMICAL PROPERTIES - continued

Auto-ignition temperature: > 400° C (hydrocarbon solvent)
Partition coefficient (octanol/water): Fenamiphos: Log P_{ow} = 3.30 at 20° C

10. STABILITY AND REACTIVITY

Chemical stability Stable under normal conditions of use.
Conditions to avoid Excessive heat
Incompatible materials Oxidising agents, bases
Hazardous decomposition products In a fire, hydrogen cyanide, carbon monoxide, oxides of phosphorus, sulphur oxides and nitrogen oxides may be formed.
Hazardous reactions None

11. TOXICOLOGICAL INFORMATION

POTENTIAL HEALTH EFFECTS

Fenamiphos, the active ingredient in Nemacur 400, is an anticholinesterase compound. Symptoms typical of cholinesterase inhibition (for all routes of entry):

Mild cases

Headache, blurred vision, weakness, sweating, mild chest pain, nausea and vomiting.

Severe cases

Cyanosis (blueness of the skin, as from lack of oxygen), muscular twitching, spasms, miosis (pinpoint pupils) and respiratory paralysis. These symptoms commence from one to three hours after excessive exposure.

Inhalation Very poisonous by inhalation.
High vapour concentrations may be irritating to the respiratory tract, may cause headaches, drowsiness and dizziness, could be anaesthetic and may have other central nervous system effects.

Skin contact Poisonous if absorbed by skin contact. Repeated exposure to the hydrocarbon solvent may cause skin dryness or cracking.

Eye contact May irritate the eyes.

Ingestion Very poisonous if swallowed. Small amounts of liquid aspirated into the respiratory system during ingestion or from vomiting may cause bronchopneumonia or pulmonary oedema.

11. TOXICOLOGICAL INFORMATION - continued

ANIMAL TOXICITY DATA - Product

Acute:

Oral toxicity	LD ₅₀ rat: 10 mg/kg (<i>similar formulation</i>)
Dermal toxicity	LD ₅₀ rat: 161 - 208mg/kg (<i>similar formulation</i>)
Inhalation toxicity	LC ₅₀ (4 h) rat: 132 - 198 mg/m ³ (<i>similar formulation</i>)
Skin irritation	Slightly irritating (rabbit) (<i>derived from the ingredients</i>)
Irritation to mucous membranes	Slightly irritating (rabbit) (<i>derived from the ingredients</i>)

Chronic:

The main health effects from repeated exposure would be toxic symptoms of cholinesterase inhibition as described above. Fenamiphos was not carcinogenic in animal studies. Fenamiphos is not mutagenic, not a reproductive toxin and not teratogenic. Fenamiphos gave no evidence of delayed neurotoxicity. This product contains naphthalene. The International Agency for Research on Cancer evaluated naphthalene and concluded that there was sufficient evidence for carcinogenicity in experimental animals, but inadequate evidence for cancer in exposed humans. Accordingly, IARC classified naphthalene as a possible human carcinogen (Group 2B).

12. ECOLOGICAL INFORMATION

Very toxic to aquatic organisms and may cause long-term adverse effects in the aquatic environment. Highly toxic to birds. DO NOT contaminate streams, rivers or waterways with Nematicur 400 or the used containers.

Ecotoxicity

Fenamiphos:

Fish toxicity:

LC₅₀: 0.0093 mg/L (96 h); bluegill sunfish (*Lepomis macrochirus*)

LC₅₀: 0.0721 mg/L (96 h); trout (*Oncorhynchus mykiss*)

Aquatic invertebrate toxicity:

EC₅₀: 0.0019 mg/L (48 h); *Daphnia magna*

Algae toxicity:

Growth rate:

IC₅₀: > 10 mg/L (72 h); green algae (*Scenedesmus subspicatus*)

Bacteria toxicity:

EC₅₀: 2030 mg/L; activated sludge

Bird toxicity:

LD₅₀: 0.7 to 1.6 mg/kg; bobwhite quail

LD₅₀: 0.9 to 1.2 mg/kg; mallard ducks

Environmental fate, persistence, degradability, mobility

Fenamiphos is not easily biodegradable. Bioconcentration factor: 110
Fenamiphos has low mobility in soil. Its half-life in soil is several weeks.

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13. DISPOSAL CONSIDERATIONS

When returnable container is empty or contents no longer required return it to the point of purchase. For non-returnable containers, triple or (preferably) pressure rinse them before disposal. Add rinsings to spray tank. Do not dispose of undiluted chemicals on-site. If recycling, replace cap and return clean containers to recycler or designated collection point. If not recycling, break, crush or puncture and bury empty containers in a local authority landfill. If no landfill is available, bury the containers below 500 mm in a disposal pit specifically marked and set up for this purpose clear of waterways, desirable vegetation and tree roots. Empty containers and product should not be burnt. Dispose of waste product as hazardous waste via a licensed disposal contractor to an approved landfill. Do not discharge into drains or sewers.

14. TRANSPORT INFORMATION

UN number	3018
Proper shipping name	ORGANOPHOSPHORUS PESTICIDE, LIQUID, TOXIC (contains fenamiphos)
Class/Division and Subsidiary Risk	6.1
Packing Group	II
EPG	Guide 35 – Dangerous Goods - Initial Emergency Response Guide
Hazchem code	2X
Marine Pollutant	Yes (Fenamiphos is a Marine Pollutant Class "P")

15. REGULATORY INFORMATION

Registered according to the Agricultural and Veterinary Chemicals Code Act 1994.
Australian Pesticides and Veterinary Medicines Authority approval number: 33295
See also Section 2.

16. OTHER INFORMATION

Training in the use of farm chemicals is recommended before handling this product.

Trademark information Nemacur® is a Registered Trademark of Bayer.

Preparation information Replaces March 18th 2008 edition.
Reasons for revision: First Aid measures.

This MSDS summarises our best knowledge of the health and safety hazard information of the product and how to safely handle and use the product in the workplace. Each user should read this MSDS and consider the information in the context of how the product will be handled and used in the workplace including in conjunction with other products.

If clarification or further information is needed to ensure that an appropriate risk assessment can be made, the user should contact this company.

Our responsibility for products sold is subject to our standard terms and conditions, a copy of which is sent to our customers and is also available on request.

END OF MSDS