

Product No.: 301  
Product Name: **FYFANON<sup>®</sup> ULV**  
ISO Name: Malathion  
EPA Reg. No. 67760-34

RRS/April 2000  
Supersedes issue marked GHB/February 2000

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## MATERIAL SAFETY DATA SHEET

# FYFANON<sup>®</sup> ULV

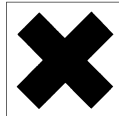
### ULTRA LOW VOLUME CONCENTRATE INSECTICIDE

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Revision: Sections containing a revision or new information are marked with a ♣.

### 1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING



Harmful

Product Name:

**FYFANON<sup>®</sup> ULV**  
ULTRA LOW VOLUME CONCENTRATE INSECTICIDE

Emergency Telephone No. - see 16: Other Information (last page)

Manufacturer: **CHEMINOVA A/S**  
P.O.Box 9  
DK-7620 Lemvig  
Denmark

Supplier in the US: **CHEMINOVA INC.**  
1700 Route 23  
Wayne, NJ 07470

### 2. COMPOSITION/INFORMATION ON INGREDIENTS

#### 2.1. ACTIVE INGREDIENT:

CAS Name .....	Butanedioic acid, [(dimethoxyphosphinothioyl)thio]-, diethyl ester
Other Name(s) .....	S-[1,2-Bis(ethoxycarbonyl)ethyl] O,O-dimethyl phosphorodithioate
ISO Name .....	<b>Malathion</b>
CAS No. ....	121-75-5
EC No. (EINECS No.) .....	204-497-7
EU Index No. ....	015-041-00-X

Material Safety Data Sheet according to 91/155/EEC (preparations)/93/112/EEC (substances) as amended.  
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Molecular Weight .....	330.36
Empirical Formula .....	C <sub>10</sub> H <sub>19</sub> O <sub>6</sub> PS <sub>2</sub>
Structural Formula .....	$\begin{array}{c} \text{S} \\ \parallel \\ \text{C H}_3\text{O} \diagdown \text{P} - \text{S} - \text{C H} \cdot \text{C O O C}_2\text{H}_5 \\ \diagup \\ \text{C H}_3\text{O} \\   \\ \text{C H}_2\text{C O O C}_2\text{H}_5 \end{array}$
2.2. Typical Content .....	96-97%
2.3. Material Use .....	Insecticide
2.4. EU Classification .....	Xn;R22
2.5. WHO Classification .....	Class III: Slightly Hazardous
2.6. USA Classification .....	Toxicity Category III, Signal Word: Caution
2.7. Canada - HMIS Ratings .....	Health: 1 Flammability: 1 Reactivity: 1 Personal Protection: See 8.1.

### 3. HAZARDS IDENTIFICATION

- 3.1. Health Hazards (Acute and Chronic) **Fyfanon<sup>®</sup>** is a cholinesterase inhibitor of low mammalian toxicity. However, inexpedient storage may induce formation of the more toxic and synergistic contaminant isomalathion (LD<sub>50</sub>, oral, rat, 89 mg/kg).
- Fyfanon<sup>®</sup>** rapidly enters the body on contact with all skin surfaces and eyes. Clothing contaminated with material must be removed immediately and all skin washed thoroughly.
- Repeated exposures to cholinesterase inhibitors such as **Fyfanon<sup>®</sup>** may, without warning, cause increased susceptibility to doses of any cholinesterase inhibitor.
- 3.2. Signs and Symptoms of Exposure Headache, nausea, vomiting, cramps, weakness, blurred vision, pinpoint pupils, tightness in chest, laboured breathing, nervousness, sweating, watering of eyes, drooling or frothing of mouth and nose, muscle spasms and coma.
- 3.3. Environmental Hazards ..... See 12.

### 4. § FIRST AID MEASURES

- 4.1. Emergency and First Aid Procedures Call a doctor (physician), clinic or hospital immediately. Explain that the victim has been exposed to **malathion**, an organophosphorus insecticide, and describe his/her condition. Immediately move the victim from the area where **Fyfanon<sup>®</sup>** is present.

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If breathing has stopped, immediately start artificial respiration and maintain until a physician takes charge of the exposed person.

If swallowed and the exposed person is conscious, make him/her vomit quickly. Make the exposed person drink 1 or 2 glasses of water and induce vomiting by touching the back of the throat with a finger. Never give anything by mouth to an unconscious person. Get medical attention immediately.

In case of contact, immediately flush eyes or skin with plenty of water while removing contaminated clothing and shoes. See physician immediately.

4.2. Note to Physician .....

**Fyfanon® (malathion)** is a cholinesterase inhibitor affecting the central and peripheral nervous systems producing respiratory depression.

Decontamination procedures such as whole body washing, gastric lavage and administration of activated charcoal are often required.

♣ Cholinesterase Inhibition - Treatment

**Antidote:** If symptoms (see 3.2.) are present, administer atropine sulphate, which is often a lifesaving antidote, in large doses, TWO to FOUR mg intravenously or intramuscularly as soon as possible. Repeat at 5 to 10 minute intervals until signs of atropinisation appear and maintain full atropinisation until all organophosphate is metabolised.

Obidoxime chloride (Toxogonin), alternatively pralidoxime chloride (2-PAM), may be administered as an adjunct to, but not a substitute for atropine sulphate. Treatment with oxime should be maintained as long as atropine sulphate is administered.

At first sign of pulmonary oedema the patient should be given supplemental oxygen and treated symptomatically.

Relapse can occur after initial improvement.  
**VERY CLOSE SUPERVISION OF THE PATIENT IS INDICATED FOR AT LEAST 48 HOURS, DEPENDING ON THE SEVERITY OF POISONING.**

**5. FIRE-FIGHTING MEASURES**

5.1. Extinguishing Media and Procedure

Dry chemical or carbon dioxide for small fires, water spray or foam for large fires.

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Use water spray to keep fire-exposed containers cool. Approach fire from upwind to avoid hazardous vapours and toxic decomposition products. Fight fire from protected location or maximum possible distance. Avoid heavy hose streams. Dike area to prevent water runoff. Firemen should wear self-contained breathing apparatus and protective clothing.

5.2. Hazardous Decomposition or Byproducts in a Fire The essential breakdown products are dimethyl sulphide, sulphur dioxide, carbon monoxide, carbon dioxide, phosphorus pentoxide.

5.3. Unusual Fire and Explosion Hazards See 10.1.

## **6. ACCIDENTAL RELEASE MEASURES**

6.1. Personal Protection ..... Observe all protection and safety precautions when cleaning up spills, see 8.

6.2. Steps to Be Taken in Case of Spill **Small liquid spills** on the floor or other impervious surface should be swept up by means of an inert absorptive material such as hydrated lime, sawdust, Fuller's earth or other absorbent clays. Scoop into proper containers and dispose of in accordance with the instructions provided under Disposal (see 13). Rinse area with soda lye.

**Large liquid spills** on the floor or other impervious surface should be contained or diked and then absorbed with an inert absorptive material such as hydrated lime, sawdust, Fuller's earth or other absorbent clays. Collect the contaminated absorbent, place in a metal drum and dispose of in accordance with the instructions provided under Disposal (see 13). Rinse area with soda lye.

Large spills that soak into the ground should be dug up, placed in metal drums and disposed of in accordance with instructions provided under Disposal (see 13).

**Fyfanon<sup>®</sup>** can be hydrolysed in water by heating and adjusting the pH (alkaline). **Fyfanon<sup>®</sup>** may also be disposed of through proper incineration.

## **7. HANDLING AND STORAGE**

7.1. Precautions To be Taken in Handling See Personal Protection, Section 8.

7.2. Precautions to Be Taken in Storing **Fyfanon<sup>®</sup>** is to be stored in closed containers or tanks in a cool dry place away from sources of heat, sparks, or open flame. Malathion products must not be heated above 55°C (131°F).

Do not contaminate water, foodstuffs, feed or seed by storage or disposal.

7.3. Fire and Explosion Precautions .... -

## **8. EXPOSURE CONTROLS/PERSONAL PROTECTION**

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- 8.1. Respiratory Protection ..... –
- Protective Gloves ..... Wear chemical resistant gloves, such as barrier laminate, butyl rubber, nitrile rubber or viton.
- Eye Protection ..... Wear safety glasses.
- Other Protection ..... Wear coveralls or long sleeved shirt and long pants. Wear shoes plus socks.
- 8.2. Work/Hygienic Practices ..... If handled indoors, provide mechanical exhaust ventilation.
- Persons working with this product for a longer period should have frequent blood tests of their cholinesterase levels. If the cholinesterase level falls below a critical point, no further exposure should be allowed until it has been determined by means of blood tests that the cholinesterase level has returned to normal.
- Keep all unprotected persons and children away from working area.
- Before removing gloves wash them with soap and water. Always wash hands, face and arms with soap and water before smoking, eating or drinking.
- After work, take off all work clothes and shoes. Shower, using soap and water. Wear only clean clothes when leaving job. Do not wear contaminated clothing. Wash protective clothing and protective equipment with soap and water after each use.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

- 9.1. Physical State ..... Liquid
- 9.2. Colour ..... Colorless to pale yellow
- 9.3. Odour ..... Slightly aromatic odour
- 9.4. Melting Point ..... 2.85°C
- 9.5. Boiling Point ..... 156-157°C at 0.7 mm Hg (however, see 10.1. Thermal Decomposition)
- 9.6. Specific Gravity ..... 1.23 g/ml at 20°C
- 9.7. Vapor Pressure ..... 3.4 x 10<sup>-6</sup> mm Hg at 25°C  
1.4 x 10<sup>-4</sup> mm Hg at 45°C
- 9.8. Viscosity ..... 16.4 cP at 40°C  
30.0 cP at 25°C
- 9.9. Solubility in Water ..... 148.2 mg/l at 25°C
- 9.10. Solubility in Organic Solvents ..... **Fyfanon<sup>®</sup>** is soluble in most organic solvents such as aromatic hydrocarbons, esters and alcohols. It is moderately soluble in aliphatic hydrocarbons.
- 9.11. Partition Coefficient n-Octanol/Water  $K_{OW}$  = 560
- 9.12. pH ..... When equal amounts of **Fyfanon<sup>®</sup>** and distilled water are dispersed at 20°C, the pH measured in the water phase is 3.7-3.8.
- 9.13. Flash Point ..... 163°C (Pensky-Martens closed tester; however, see 10.1.)

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- 9.14. Autoignition Temperature ..... Not available  
9.15. Flammable Limits ..... Not available

## 10. STABILITY AND REACTIVITY

- 10.1. Thermal Decomposition ..... **Fyfanon®** will decompose rapidly when heated to temperatures above 100°C, significantly increasing the risk of explosion.  
  
The decomposition is to a considerable extent dependent on time as well as temperature due to exothermic and autocatalytic reactions. The reactions involve rearrangements and polymerisation releasing volatile malodorous and inflammable compounds such as dimethyl sulphide.
- 10.2. Hazardous Decomposition or Byproducts ..... See 3.1 and 5.2.
- 10.3. Materials to Avoid ..... Strong alkalis, amines and strong oxidizing compounds. It can corrode iron, steel, tin plate, lead and copper. **Fyfanon®** is rapidly hydrolysed at pH > 7.0 or < 5.0.

## 11. TOXICOLOGICAL INFORMATION

- 11.1. Health Hazards ..... See 3.1.
- 11.2. Route(s) of Entry
- Ingestion LD<sub>50</sub>, oral, rat: 5500 mg/kg<sup>\*)</sup>
  - Skin LD<sub>50</sub>, dermal, rat: > 2000 mg/kg
  - Inhalation LC<sub>50</sub>, inhalation, rat: > 5.2 mg/l/4 h
- <sup>\*)</sup> Values from 1000 to 2830 mg/kg are stated in literature as well as in WHO Data Sheet No. 29, VBC/DS/77.29.
- 11.3. Irritancy ..... Slightly irritating to skin and eyes.
- 11.4. Allergic Sensitisation ..... Not causing hypersensitivity in guinea pigs.
- 11.5. Carcinogenicity ..... IARC evaluation: The available data provide no evidence that **malathion** is likely to present a carcinogenic risk to humans.
- 11.6. Reproductive Effects ..... No effects on reproductivity are found for **malathion** in rats and rabbits at maternal non-toxic doses.
- 11.7. Teratogenicity ..... No indications of teratogenic effects of **malathion** are found.
- 11.8. Mutagenicity ..... **Malathion** is not mutagenic.

## 12. ECOLOGICAL INFORMATION

**Fyfanon®** is biodegradable. It undergoes rapid degradation in the environment and in waste water treatment plants. No adverse effects are observed at concentrations up to 100 mg/l in waste water treatment plants. Degradation occurs both aerobically and anaerobically, biologically as well as abiotically.

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Under normal conditions **Fyfanon<sup>®</sup>** is of medium mobility in soil, but is degraded rapidly.

**Fyfanon<sup>®</sup>** is toxic to fish, aquatic invertebrates, and aquatic life stages of amphibians. **Fyfanon<sup>®</sup>** is highly toxic to bees. The acute toxicity is:

- Fish	96-h LC <sub>50</sub> , Rainbow trout ( <i>Salmo gairdneri</i> ) .....	0.200 mg/l
- Invertebrates	48-h LC <sub>50</sub> , Daphnids ( <i>Daphnia magna</i> ) .....	1.0 µg/l
- Birds	LD <sub>50</sub> , Japanese quail (bobwhite quail) .....	400 mg/kg
- Bees	24-h LD <sub>50</sub> , bees, topical .....	0.27 µg/bee
	24-h LD <sub>50</sub> , bees, oral .....	0.38 µg/bee

### 13. DISPOSAL CONSIDERATIONS

- 13.1. Waste Disposal Method ..... Spill and waste disposal procedures in conformity with state and local regulations must be followed.  
Do not contaminate water, foodstuffs, feed or seed by storage or disposal.
- 13.2. Container Disposal ..... Triple rinse (or equivalent). Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill.  
However, procedures in conformity with state and local regulations must be followed.

### 14. § TRANSPORT INFORMATION

#### UN CLASSIFICATION:

- ♣ Proper Shipping Name ..... Environmentally Hazardous Substance, Liquid, N.O.S. (Malathion 97%)  
UN No. .... 3082  
Packaging Group ..... III  
Class ..... 9  
Primary Hazard ..... Miscellaneous  
Subsidiary Risk ..... -  
Marine Pollutant (P/PP) ..... Marine Pollutant  
(IMDG Code)
- ♣ US CFR ..... RQ (100 lbs.)

### 15. § REGULATORY INFORMATION

- 15.1. **IN THE EU:**  
Classification and Labelling:  
(according to 88/379/EEC as amended):

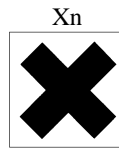
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Danger Symbol .....



Harmful

R-phrases .....

R22: Harmful if swallowed.

S-phrases .....

S24: Avoid contact with skin.

15.2. Threshold Limit Value .....

♣

OSHA (USA) PEL-TWA	ACGIH (USA) TLV-TWA	MAK (Germany)	HGV (Denmark)	Australia
10 mg/m <sup>3</sup> skin	10 mg/m <sup>3</sup> skin	15 mg/ m <sup>3</sup>	5 mg/m <sup>3</sup> skin	10 mg/m <sup>3</sup> skin

However, threshold limit values defined by local regulations must be observed.

This product has been classified in accordance with the hazard criteria of the CPR (Controlled Products Regulations) and the MSDS contains all of the information required by the CPR.

## 16. § OTHER INFORMATION

This material should only be used by persons who are made aware of its hazardous properties and have been instructed in the required safety precautions.

### IN THE USA:

Emergency Medical Telephone Number in the US 1-800-228-5635, Ext. #153  
Other Emergencies in the US CHEMTREC toll free 1-800-424-9300  
Telephone Number for Information in the US (973) 305-6600

Emergency Telephone Number in Denmark (+45) 97835353 (Cheminova Agro AS, Denmark)