MATERIAL SAFETY DATA SHEET

Date of Issue: September 23, 2002

1. IDENTIFICATION OF THE SUBSTANCE / MIXTURE AND SUPPLIER

Product name	**Thiodan® EC Insecticide**
Other names	None
Product code	AE F002671 00 EC33 B3
Chemical group	Organochlorine
Recommended use	Agricultural insecticide
Formulation	Emulsifiable concentrate
Supplier	Bayer CropScience Pty Ltd ABN 87 000 226 022
Address	391 - 393 Tooronga Road, East Hawthorn Victoria 3123, Australia
Telephone	(03) 9248 6888
Facsimile	(03) 9248 6800
Website	www.bayercropscience.com.au
Contact	Development Manager (03) 9248 6888
Emergency Telephone Number	1800 033 111 – Orica SH&E Shared Services

2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

HAZARDOUS SUBSTANCE (see Risk phrases below) - DANGEROUS GOOD

Combustible liquid. Extremely dangerous to fish.

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

Risk phrases
R23/24/25 – Toxic by inhalation, in contact with skin and if swallowed.
R36 – Irritating to eyes.
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 – ORGANOCHLORINE PESTICIDE, LIQUID, TOXIC (contains endosulfan), Class 6.1, Packing Group II, UN2996. For transport by sea this product is a MARINE POLLUTANT.

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

3. COMPOSITION / INFORMATION ON INGREDIENTS

Ingredients	CAS Number	Concentration (g/L)
Endosulfan	[115-29-7]	350
Hydrocarbon solvent	[64742-94-5]	640
Naphthalene (in hydrocarbon solvent)	[91-20-3]	(19 – 38)
Other ingredients	(non hazardous)	89

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 medical advice if at all worried. If breathing stops or shows signs of failing, start artificial respiration. Call for prompt medical attention.

Skin contact

Carefully remove contaminated clothing. Wash affected areas with soap and water. Seek medical aid if at all worried.

Eye contact

Rinse eyes immediately with clean water for at least 15 minutes and obtain urgent medical aid.

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. DO NOT attempt to give anything by mouth to a semi-conscious or unconscious person. Avoid giving milk or oils.

First Aid Facilities

Provide eyewash and safety shower facilities in the workplace.

Medical attention

Symptoms

Local: Skin and eye irritation

Systemic: Headache, dizziness, ataxia, nausea, vomiting, abdominal pain, unconsciousness and convulsions

Treatment

For *local contamination* treatment should be symptomatic after decontamination. In case of skin or eye contamination, treat as above under First Aid Measures.

In case of systemic poisoning, the following measures should be taken:

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. If endosulfan, a highly toxic material, has been ingested, induction of vomiting is recommended under the following circumstances:

Medical treatment is not readily available, the patient is fully conscious, time since ingestion is less than 1- 2 hours. HOWEVER, this must be considered along with the presence of the hydrocarbon liquid.

Monitor respiratory, cardiac, kidney, central nervous system and liver functions.

Observe ECG and EEG, particularly if unconscious.

Gastric lavage with 30% aqueous magnesium sulphate solution followed by charcoal administration

Endotracheal intubation and artificial respiration, as necessary

Elimination by dialysis - forced alkaline diuresis

Anticonvulsant therapy, as considered appropriate, with phenobarbital i.v and 10% calcium gluconate i.v., benzodiazepines, e.g. clonazepam, diazepam, i.v.

There is no specific antidote.

Contraindications: Adrenergic compounds, morphine derivatives, atropine and pralidoxime.

Recovery: Neurological delayed effects including brain oedema can be expected.

5. FIRE FIGHTING MEASURES

Extinguishing media Foam, dry chemical, waterspray

Hazards from combustion products In a fire, irritant and toxic fumes containing oxides of carbon and sulphur, and hydrogen chloride may be generated.

Precautions for fire fighters The product is a Class C1 Combustible liquid.
Firefighters 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. 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. Avoid spraying directly into containers due to danger of boilover. 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.

6. ACCIDENTAL RELEASE MEASURES

Avoid contact with the spilled material or contaminated surfaces. Extinguish or remove all possible sources of ignition. When dealing with spills do not eat, drink or smoke and wear full-body impervious clothing and equipment as described in Section 8 - PERSONAL PROTECTION. Keep people and animals away and upwind. Prevent spilled material from entering drains or watercourses. Contain spill and absorb with earth, sand, clay, or other absorbent material. Collect and store in properly labelled, sealed 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.

7. HANDLING AND STORAGE

Handling Keep out of reach of children. Very dangerous. Poisonous if absorbed by skin contact, inhaled or swallowed. Will damage eyes. Will irritate the skin. Avoid contact with eyes and skin. Do not inhale vapour or spray mist. If product or spray in eyes, wash it out immediately with water. 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, goggles, respirator (if rubber, wash with detergent and warm water) and contaminated clothing.

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

Flammability Combustible liquid, Class C1 - flashpoint between 61° C and 150º C.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure standards

TLV-TWA for Endosulfan is 0.1 mg/m^3, Skin notation (ACGIH)

The manufacturer of the solvent recommends an Occupational Exposure Limit for solvent naphtha (petroleum), heavy aromatic:
TWA: 100 mg/m^3 (17 ppm).
For the small amount of naphthalene present in the solvent the NOHSC Occupational Exposure Limits are:
TWA: 10 ppm (52 mg/m^3, STEL: 15 ppm (79 mg/m^3). Skin notation.

Threshold Limit Value-Time Weighted Average (TLV-TWA) – the time-weighted average concentration for a conventional 8-hour workday and a 40-hour workweek, to which it is believed that nearly all workers may be repeatedly exposed, day after day, without adverse effect.
ACGIH = American Conference of Governmental Industrial Hygienists
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.

Engineering controls

Control process conditions to avoid contact. Use local exhaust ventilation during manufacture and spark proof equipment. Use in a well-ventilated area only.

Personal Protective Equipment

Product is very dangerous - poisonous if absorbed by skin contact, inhaled or swallowed.

- Wear full facepiece respirator - AS/NZS 1715/1716 approved, to protect eyes and avoid inhalation (or goggles and half facepiece respirator).
- Wear protective waterproof clothing and water-resistant footwear.
- Wear elbow-length PVC gloves.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Clear pale yellow to amber liquid
Odour:	Slight aromatic odour
pH:	Approx. 6 (1% aqueous emulsion)
Vapour pressure:	0.3 kPa (at 38° C) - solvent
Vapour density:	> 1.00 - solvent
Boiling point:	179 - 213° C (boiling point range of solvent)
Freezing/melting point:	Not available
Solubility:	Emulsifies in water
Specific Gravity:	1.079 at 20° C
Flash Point:	65° C (Pensky Martens Closed Cup)
Flammability (explosive) limits:	LEL: 0.6; UEL: 7.0 Vol. % in air (hydrocarbon solvent)
Auto-ignition temperature:	> 400° C (hydrocarbon solvent)
Partition coefficient (octanol/water):	Not available

10. STABILITY AND REACTIVITY

Chemical stability	Stable under normal conditions of use.
Hazardous polymerisation	Will not polymerise.
Conditions to avoid	Avoid sources of ignition and extreme heat.
Incompatible materials	Decomposes in the presence of acids and alkalis. Incompatible with strong oxidising agents.
Hazardous decomposition products	Sulphurous oxides, chlorine compounds

11. TOXICOLOGICAL INFORMATION

POTENTIAL HEALTH EFFECTS

Inhalation	Poisonous by inhalation. High vapour concentrations may be irritating to the respiratory tract and may cause headaches, dizziness, drowsiness, anaesthesia, and other central nervous system effects.
Skin contact	Poisonous if absorbed by skin contact. Will irritate the skin. Repeated exposure may cause skin dryness or cracking.
Eye contact	Will cause irritation and damage to the eyes.
Ingestion	Very dangerous. Poisonous if swallowed. Symptoms and signs of poisoning - headache, dizziness, ataxia, nausea, vomiting, abdominal pain, unconsciousness and convulsions. Small amounts of liquid aspirated into the respiratory system during ingestion or from vomiting may cause bronchopneumonia or pulmonary oedema.

ANIMAL TOXICITY DATA – PRODUCT

Acute:

Oral toxicity	LD_{50} rat (M+F): 36 mg/kg (*similar product*)
Dermal toxicity	LD_{50} rat: ~ 400 mg/kg *(similar product*)
Inhalation toxicity	LC_{50} (4 h) rat: 0.34 – 0.76 mg/L air (*similar product*)
Skin irritation	No data – expected to be irritating to skin
Eye irritation	No data – expected to be very irritating and damaging to eyes
Sensitisation	*Endosulfan*: Non-sensitising (guinea pig)

11. TOXICOLOGICAL INFORMATION - continued

Chronic:

Endosulfan is not a cumulative poison; i.e. it is not stored in body fat. Endosulfan was not mutagenic in the Ames test, was not genotoxic, showed no indications of toxic effects in reproduction studies in animals, and gave no indications of carcinogenic effects from long-term trials. Endosulfan does not affect the human immune system and is not an endocrine disruptor.
This product contains naphthalene. A National Toxicology Program (NTP) report states that lifetime inhalation exposure to naphthalene resulted in increases in tumours of the nose in rats. In a previous NTP study, lifetime inhalation exposure to naphthalene increased lung tumours in female mice. The relevance of the rodent findings to humans is questionable.

12. ECOLOGICAL INFORMATION

Extremely dangerous to fish. May be harmful to wildlife. Endosulfan is dangerous to bees in laboratory conditions, but formulations are not hazardous under field conditions if used properly.
DO NOT contaminate streams, rivers or waterways with Thiodan EC or the used containers.

Ecotoxicity	*Endosulfan:* *Fish toxicity:* LD_{50}, (96 h) for golden orfe 0.002 mg/kg LC_{50} (96 h) rainbow trout 0.9 μg/L *Daphnia toxicity:* EC_{50} (48 h) for Daphnia 75 - 750 μg/L *Bird toxicity:* LD_{50} mallard ducks 205 - 245 mg/kg; ring-necked pheasants 620 - 1000 mg/kg *Algal toxicity:* EC_{50} (72 h) for green algae > 0.56 mg/L
Environmental fate, persistence and degradability	*Endosulfan:* Moderately/partially biodegradable Does not leach into groundwater.

13. DISPOSAL CONSIDERATIONS

Thoroughly drain containers before disposal. Add drainings to application equipment. 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. (Under special circumstances waste product may be incinerated in an approved incinerator, according to government regulations.) 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	2996
Proper shipping name	ORGANOCHLORINE PESTICIDE, LIQUID, TOXIC (contains endosulfan)
Class and Subsidiary Risk	6.1 No subsidiary risk
Packing Group	II
EPG	Guide 34 – Dangerous Goods - Initial Emergency Response Guide
Hazchem code	2X
Marine Pollutant	Yes

15. REGULATORY INFORMATION

Registered according to the Agricultural and Veterinary Chemicals Act 1988

National Registration Authority approval number: 50004

RESTRICTED CHEMICAL PRODUCT – ONLY TO BE SUPPLIED TO OR USED BY AN AUTHORISED PERSON.

See also Section 2.

16. OTHER INFORMATION

Trademark information	Thiodan® is a Registered Trademark of Bayer.
Preparation information	Replaces August 1, 2002 MSDS. Reasons for revision: Updated MSDSs for solvent and Thiodan technical, 16 heading format, medical attention, hazard classification.

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