1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME : DIMETHOATE EC

ADDRESS: **P O Box 498** **21 Viben Street**
Brackenfell **Brackenfell**
7561 **7560**

PHONE No: **021 982 1460**
EMERGENCY No.: **Toll free number (24 hours): 082911**
For overseas customers (24 hours): +27-11-254 1911
National Poison Centre: **021-9386084**

2. COMPOSITION / INFORMATION ON INGREDIENTS:

HAZARDOUS INGREDIENTS:	**CAS NO.:**
Dimethoate	60-51-5

Chemical name: O,O-dimethyl S-[2-(methylamino)-2-oxoethyl] phosphorodithioate (IUPAC)
Chemical family: Organophosphate
Chemical formula: $C_5H_{12}NO_3PS_2$ (Mol. wt.: 229.3)
NIOSH No. Not available
UN No. 3017
EEC classification: Harmful.
R Phases: R 21/22
Hazchem code: 6.1 Subsidiary 3

3. HAZARD IDENTIFICATION:

This compound inhibits cholinesterase enzyme activity in the nervous tissue. It is highly toxic. Contact with skin, inhalation of spray, or swallowing may be fatal.

4. FIRST- AID MEASURES:

Inhalation:
If breathing has stopped, apply cardiopulmonary resuscitation immediately and maintain till doctor sees victim. If breathing is difficult give oxygen. GET IMMEDIATE MEDICAL ATTENTION.

Skin contact:
Remove contaminated clothing, shoes and leather goods. Gently wipe of excess chemical. Wash skin gently and thoroughly with water and non-abrasive soap. Do not rub the skin. GET MEDICAL ATTENTION IMMEDIATELY.

Eye contact:
Immediately flush eyes with gently flowing cold water or saline solution for 20 minutes, holding the eyelid(s) open. SEEK MEDICAL ATTENTION IMMEDIATELY.

Ingestion:
DO NOT APPLY DIRECT TO MOUTH TO MOUTH RESUSCITATION !NEVER ADMINISTER ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON.
Have victim drink 1 or 2 glasses of water and induce vomiting by touching back of throat with finger. Repeat until vomit fluid is clear. Have victim lie down and keep quiet. If breathing has stopped, apply cardiopulmonary resuscitation immediately and maintain till doctor sees victim.

EFFECTS OF OVEREXPOSURE:
Headache, dizziness, weakness, in coordination, muscle twitching, tremor, nausea, abdominal cramps, diarrhoea and sweating are common symptoms. Blurred or dark vision, confusion, tightness in the chest, wheezing, productive cough and pulmonary edema may occur. Incontinence, unconsciousness and convulsions indicate severe poisoning. Slow heartbeat, salivation and tearing are common. Toxic psychosis, with manic or bizarre behaviour, has led to misdiagnosis of acute alcoholism. Slowing of the heartbeat may rarely progress to complete sinus arrest. Respiratory depression may be fatal.

Advice to physician:
1. Administer **atropine sulphate** intravenously or intramuscularly, if i.v. injection is not possible. Atropine protects the muscarinic end-organs from excessive concentrations of acetylcholine. It does not reactivate the cholinesterase enzyme. Recrudescence of poisoning may occur if tissue concentrations of organophosphate remain high when the effects of atropine wears off. Atropine is the ideal antidote for muscarinic manifestations; it is ineffective against nicotine actions: muscle weakness and twitching, and respiratory depression.

In moderately severe poisoning:
ADULT DOSAGE, including children over 12 years: 0,4 – 2,0 mg repeated every 15 minutes until atropinization is achieved: tachycardia (pulse of 140 per minute), flushing , dry mouth, dilated pupils. Maintain atropinization by repeated doses for 2 – 12 hours or longer depending on severity of poisoning. Rales in the lung bases indicate inadequate atropinazation. Miosis nausea, bradycardia, and other cholinergic manifestations are also indicative.

4. FIRST- AID MEASURES (contd.):

DOSAGE FOR CHILDREN, under 12 years: 0,05 mg/kg bodyweight, repeated every 15 minutes until atropinization is achieved. Maintain atropinization with repeated dosage of 0,02 – 0,05 mg/kg. Severely poisoned individuals may exhibit remarkable tolerance to atropine; two or more times the dosage above may be needed. Person not poisoned or slightly poisoned, however, may develop signs of atropine toxicity from such large dosages: Fever, muscle fibrillations, and delirium are the main signs of atropine toxicity. If these signs appear while the patient is fully atropinized, atropine administration should be discontinued, at least temporarily.

2. Draw a blood sample for plasma and RBC cholinesterase analysis.

3. Administer obidoxime chloride (Toxigonin, Merck) in cases of severe poisoning by organophosphate pesticides in which respiratory depression, muscle weakness and twitchings are severe. When administered early (usually less than 36 hours after poisoning) obidoxime relieves the nicotinic effects of poisoning.

   ADULT DOSAGE: 3-5mg/kg iv. carefully and slowly, 5 minutes after atropine administration. The upper limit should not be exceeded, and administration should not be repeated within 2 hours.

   CHILD'S DOSAGE: 4-8 mg/kg iv. slowly 5 minutes after atropine administration. The upper limit should not be exceeded, and administration should not be repeated within 2 hours.

   NOTE: Obidoxime chloride is of doubtful value in poisonings by the cholinesterase-inhibiting carbamate compounds, and may even be contraindicated.

   CAUTION: Be prepared to assist pulmonary ventilation mechanically if respiration is depressed during and after obidoxime injections.

4. Observe patient closely for at least 24 hours to ensure that symptoms (sweating, visual disturbances, vomiting, diarrhoea, chest and abdominal distress and sometimes pulmonary oedema) do not recur as atropinization wears off. In very severe poisonings by ingested organophosphates, particularly the more lipophilic and slowly hydrolysed compounds, metabolic disposition of toxicant may require as many as 5 – 10 days during which atropinization must be maintained. Rising levels of blood cholinesterase are a useful signal that atropine dosage may be tapered off by lengthening the intervals between doses. As dosage is reduced, the lung bases should be checked for rales. If rales are heard, or if there is a return of miosis, bradycardia, sweating or other cholinergic signs, atropinization must be re-established promptly.

4. FIRST- AID MEASURES (contd.):

5. Bathe and shampoo victim with soap and water if there is any chance that skin and hair are contaminated.

6. If pesticide has been ingested in a quantity sufficient to cause poisoning, empty the stomach and intestine.

6.1 If victim is alert and respiration is not depressed, give syrup of Ipecac, followed by 1- 2 glasses of water to induce vomiting. Adults (12 years and over) 30 ml, children under 12 years: 15 ml.

CAUTION: Observe victim closely after administering Ipecac. If consciousness level declines, or if vomiting has not occurred in 15 minutes, proceed immediately to intubate stomach. Following emesis, have victim drink a suspension of 30 – 50 g activated charcoal in 90 – 120 ml water to limit absorption of toxicant remaining in the gut.

6.2 If victim is obtunded or if respiration is depressed empty the stomach intubation, aspiration and lavage, using isotonic saline or 5 % sodium bicarbonate. Because many pesticides are dissolved in petroleum distillates, emesis and intubation of the stomach involve a serious risk that solvent will be aspirated, leading to chemical pneumonitis.

5. FIRE-FIGHTING MEASURES:

Extinguishing Media: Small fires – dry chemical, carbon dioxide, water spray or foam
Large fires – water spray, fog or AFFF.

Fire / Explosion Hazards: Slight fire hazard when exposed to heat or flame. Fire may produce irritating or poisonous mists (hydrogen sulfide, carbon oxides and sulfur oxides) or other products of combustion.

Fire fighting: If area is heavily exposed to fire and if conditions permit, let fire burn itself out, since water may increase the contamination hazard. If conditions do not permit, extinguish with water spray. Do not allow run-off water to enter sewers or natural waters.

Fire Fighting Protective Equipment: Fire-fighters and others that may be exposed should wear full protective clothing and use self contained breathing equipment.

6. ACCIDENTAL RELEASE MEASURES:

Personal precautions: Do not inhale fumes. Ventilate area of spill or leak, especially confined areas. Avoid contact with skin, eyes or clothes.

Environmental precautions: Do not allow entering drains or watercourses. When the product contaminates public waters, inform appropriate authorities immediately in accordance with local regulations.

Methods for cleaning up: Small spills – take up with sand or other absorbent material and place into containers for later disposal. Avoid runoff to sewer as it may cause fire/explosion. Do not allow the product to come into contact with water system. For small dry spills, with a clean shovel place material into clean dry containers and cover. Move containers from spill area.

Large spills – dike far ahead of spill for later disposal. Keep unnecessary people away. Isolate hazard area and deny entry. Ventilate closed spaces before entering.

7. HANDLING AND STORAGE:

HANDLING:

Remove sources of naked flame or sparks. Do not eat, drink or smoke during handling operations. Avoid contact with eyes and skin and inhalation of fumes. Use with adequate ventilation.

STORAGE:

Store in dry, cool, well-ventilated location (avoid temperatures above 40ºC). Keep separate from other materials especially acids and caustics. Keep away from heat and ignition sources. Avoid cross contamination with other pesticides and fertilizers. Not to be stored next to foodstuffs and water supplies.

8. EXPOSURE CONTROL / PERSONAL PROTECTION:

Occupation exposure limits: No occupational limits established by OSHA, ACGIH or NIOSH

Engineering measures: It is essential to provide adequate ventilation. Ensure that control systems are properly designed and maintained.

Only spark-resistant equipment should be used. Comply with occupational safety, environmental, fire and other applicable regulations.

8. EXPOSURE CONTROL / PERSONAL PROTECTION (Cont):

Personal protective equipment:

Respiratory system:	3M Type 7300 Facepiece fitted with two 7153 Cartridges (Organic Vapour/Acid Gas) type A1/E1 plus fitted with prefilters type 7156 A1B2
Clothing:	Employee must wear appropriate protective (impervious) clothing and equipment to prevent any possibility of skin contact with this substance.
Gloves:	Full length rubber gloves
Eye protection:	Splash-proof or dust-resistant safety goggles and faceshield

9. PHYSICAL AND CHEMICAL PROPERTIES:

Appearance	: Liquid
Color	: Clear blue
Odor	: Aromatic
Flash point	: 53,3 º C.
Flammability	: Flammable
Relative density	: 1.05 g/l at 20ºC
Storage stability	: Stable for up to 2 years under normal warehouse and field conditions.
Solubility in water	: Emulsifies in water
Partition-coefficient in n-octanol/water	: K_{ow} ($logP_{ow}$) = 0.704 (*data for active substance*)
Melting point	: Not applicable.

10. STABILITY AND REACTIVITY:

Stability:
The product is stable in aqueous media at pH 2-7. Product is decomposed by alkalis and heating.

Incompatibility:
The product is compatible with most other common pesticides but incompatible with alkaline materials and with sulfur-based formulations. Do not physically mix concentrate directly with other herbicides or pesticide concentrates; always dilute first.

10. STABILITY AND REACTIVITY (cont):

Hazardous decomposition:
Product undergoes decomposition at high temperatures. Avoid heating above ambient temperature. Toxic fumes (hydrogen sulfide, carbon oxides and sulfur oxides) may be released when the product decomposes on heating.

11. TOXICOLOGY INFORMATION:

Acute oral LD_{50}:	200 mg/kg body weight in rats
Acute dermal LD_{50}:	600 – 1200 mg/kg in rabbits
Acute inhalation LC_{50} (4 h)	> 1.6 mg/l air (*Data on active ingredient*) Inhalation of the solvent's vapours at high doses have also resulted in an increased incidence of malformations and decreased fetal weight in laboratory animals.
Acute skin irritation:	Non-irritant
Acute eye irritation:	Mild irritant for the eyes
Carcinogenicity:	Studies did not detect carcinogenic activity. No human information available.
Teratogenicity / Reproduction:	Studies did not detect any teratogenic effects. No human information available.
Mutagenicity:	Studies indicated mutagenic activity

12. ECOLOGICAL INFORMATION:

Degradability:

(*Technical material*)
This product is an organophosphate insecticide that is widely applied to soil to control insect pests. The pathway of degradation in soil involves both chemical and microbial processes.
Environmental factors can greatly influence the degradation rate in soil; the most important being moisture, pH, organic content, and pesticide formulation. Absorption and desorption constants have been shown to be a linear function of soil silt content K_{oc} ranges from 16.25 (sandy loam) to 51.88 (sandy/loam sand).
This product in formulation can be classified as non-persistent.
DT_{50} aerobic: 2-4.1 days
DT_{50} photolytic on soil surface: 7-16 days

12. ECOLOGICAL INFORMATION (cont):

Mobility: Low potential for leaching
Accumulation: Product degrades rapidly with short half-life
German wgk: 3

ECOTOXICOLOGY:
Birds Toxic to birds
Fish LC_{50} (96 h): 6.2 mg/l (Rainbow trout) Toxic to fish
Daphnia LC_{50} (24 h): 4.7 mg/l
Bees Toxic to bees LC_{50} (oral and topical): 0.1-0.2 µg/l
Earthworms LC_{50} 31,0 mg/kg soil.

13. DISPOSAL CONSIDERATIONS:

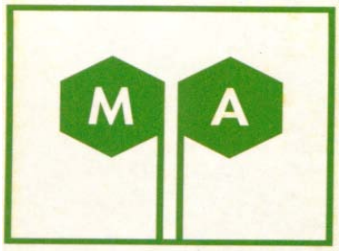
Pesticide disposal:
Contaminated absorbents, surplus product, etc., should be burned in a high-temperature incinerator (>1000ºC) with effluent gas scrubbing. Never pour untreated waste or surplus products into public sewers or where there is any danger of run-off or seepage into water systems. Comply with local legislation applying to waste disposal.

Package product wastes:
Emptied containers retain vapour and product residues. Observe all labelled safeguards until container is destroyed. Combustible containers should be disposed of in pesticide incinerators. Non-combustible containers must be triple rinsed with water and then be punctured and trasported to a scrap metal facility for recycling for recycling or disposal in approved landfill site. Comply with any local legislation applying to disposal.

14. TRANSPORT INFORMATION:

UN NUMBER: 3017

ADR/RID:
Substance ID NR: 3017



TRANSPORT INFORMATION (contd)

Proper shipping name: Organophosphorous pesticide, liquid, toxic, flammable (dimethoate400 g/ℓ)
Hazard ID NR: 63
Label: 6.1 + 3
Item no: 72^{o} (c)

AIR/IATA :.
Proper shipping name: Organophosphorous pesticide, liquid, toxic, flammable (dimethoate 400 g/ℓ)
Class: 6.1
Subsidiary Risk: 3
Hazard Label: Toxic & flammable liquid
Packaging group: III
Passenger aircraft : 611 (max 60 L) Y611 (2 L)
Cargo aircraft: 618 (max 220 L)

IMDG/IMO:.
Proper shipping name: Organophosphorous pesticide, liquid, toxic, flammable (dimethoate 400 g/ℓ)

Packaging group: III
Label of class: 6.1 **MARINE POLLUTANT**
Subsidiary Risk: 3

Tremcard no: 61GTF2-III

15. REGULATORY INFORMATION:

Symbol : Xn

Indication of danger : Harmful, dangerous for the environment

Risk phrases	: **R21/22**	Harmful if swallowed and contact with skin
Safety phrases	: **S1/2**	Keep locked up and out of reach of children
	: **S 28**	After contact with skin, wash immediately with plenty of water and non-abrasive soap.
	: **S 36/37**	Wear suitable protective clothing, and gloves
	: **S 61**	Avoid release to the environment. Refer to special instructions / Safety data sheets.

15. REGULATORY INFORMATION(Cont):

National Legislation:
In accordance with the South African National Road Traffic Act, 1996 (Act 93 of 1996), the Fire Brigade Act, 1987 (Act 99 of 1987) and the Occupational Health and Safety Act, 1993 (Act No. 85 of 1993).

16. OTHER INFORMATION:

The data in this Material Safety Data Sheet relates only to the specific material designated herein and does not relate to use in combination with any other material or in any process. All information is given in good faith but without guarantee in respect of accuracy, and no responsibility is accepted for errors or omissions or the consequence thereof.

REFERENCES

- Similar product MSDS.
- The Pesticide Manual; Eleventh Edition; Editor Clive Tomlin; Crop Protection Publications, 1997.
- Dangerous Goods Regulations; IATA International Air Transport Association, 41st Edition, Effective 1 January 2000.
- IMDG Code, Vol. 2, 2000 Edition/.
- EXTOXNET, Pesticide Information Profiles, Revised June 1996. The primary files are maintained and archived at the Oregon State University.

END OF MSDS