PARATHION EC MATERIAL SAFETY DATA SHEET

1. IDENTIFICATION OF THE SUBSTANCE

Product Name:	**PARATHION EC**
	Insecticide
Common Name:	Parathion
Chemical Name:	*O,O* diethyl *O*-4-nitrophenyl phosphorothioate (**IUPAC**).
CAS N^{o}.:	56-38-2
Chemical family:	Organophosphate
Chemical formula	$C_{10}H_{14}NO_5PS$ (Mol. wt.:291.3)
Use:	Broadspectrum organophosphate pesticide used to control many insects and mites.
Formulation:	Parathion: 500 g/ℓ
	Emulsifiable Concentrate
UN No.:	3018

Supplier:	**Universal Crop Protection (Pty) Ltd**.
	PO Box 801
	Kempton Park, 1620, South Africa
Telephone:	(011) 396 2233
Fax:	(011) 396 4666
Website:	www.villacrop.co.za

Emergency telephone: (011) 396 2233
083 326 9272

24 Hr Emergency Numbers:

Bateleur Trauma: 0860 333 911
(Client: Villa Crop Protection)
Red Cross Poison Information Centre: 021 689 5227
Tygerberg Poison Information Centre: 021 931 6127
Griffon Poison Information Centre: 082 446 8946

2. COMPOSITION / INFORMATION ON INGREDIENTS

Hazardous component:	parathion
Symbols:	T+; N
Risk-Phrases:	R 26/27/28-50/53

3. HAZARD IDENTIFICATION

Toxicity class:
WHO I; EPA I
Parathion is a compound, which inhibits cholinesterase enzyme activity in the nervous tissue. It is of very high toxicity. Contact with skin, inhalation of dust or spray, or swallowing may be fatal. Toxic to fish and bees.
Likely routes of exposure:
May be absorbed from the gastrointestinal tract, through the intact skin, and through inhalation of fine spray mist or dust.
Eye contact:
Highly toxic. Irritating to eyes.
Skin contact:
Highly toxic, due to possible absorption. Mildly irritating to skin.
Ingestion:
Highly toxic by ingestion. See point 4 for symptoms.
Inhalation:
Highly toxic by inhalation depends on volatility of compound. See point 4 for symptoms.

4. FIRST AID MEASURES AND PRECAUTIONS

Symptoms of exposure to the product include: nausea, headache, tiredness, giddiness, blurred vision and pupillary constriction. Depending on severity of poisoning these symptoms become worse with the onset of vomiting, abdominal pain, diarrhoea, sweating and salivation. Confusion, ataxia, slurred speech, loss of reflexes are some of the central nervous system effects may lead to misdiagnosis of acute alcoholism.
Overexposure effects:
After **inhalation of vapours or aerosols** effects appear within minutes: ocular and respiratory effects generally appear first. This includes marked miosis, ocular pain, conjunctival congestion, diminished vision, ciliary spasm and brow ache.
With **acute systemic absorption**, miosis may not be evident due to sympathetic discharge in response to the hypotension. In addition to rhinorrhea and hyperemia of the upper respiratory tract, respiratory effects consist of “tightness” in the chest and wheezing respiration, caused by the combination of broncho-constriction and increased bronchial secretion. Gastrointestinal symptoms occur earliest after ingestion, and include anorexia, nausea and vomiting, abdominal cramps, and diarrhoea.
With **percutaneous absorption** of liquid, localized sweating and muscular fasciculation in the immediate vicinity are generally the earliest manifestations.
Severe intoxication is manifested by extreme salivation, involuntary defecation and urination, sweating, lacrimation, penile erection, bradycardia and hypotension. The airway should be kept clear to maintain respiration, particularly when the patient is unconscious or has vomited. The mouth and pharynx should be cleared and dentures removed. The jaw should be supported and the patient placed in a face down position with the head down and turned to one side, with the tongue drawn forward. First aid should include, if necessary, mouth-to-nose respiration, cardiac massage and avoidance of injury in patients with trauma.
Inhalation:
Remove source of contamination or move victim to fresh air. Keep affected person warm and at rest. Supply

oxygen if necessary. Treat symptomatically and supportively. **Seek medical advice immediately.**

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. Seek medical advice if necessary. Persons who become sensitised may require specialised medical management with anti-inflammatory agents.

Eye contact:
Immediately flush eyes with gently flowing cold water or saline solution for 15 to 20 minutes, holding the eyelid(s) open. **Seek medical attention immediately.**

Ingestion:
Have victim rinse mouth thoroughly with water. Do not induce vomiting, due to the aromatic solvent. **Seek medical advice immediately.**

Advice to physician:
Atropine must be administered as early as possible and could save lives, if given in time and in an adequate dosage. Patients with organophosphate poisoning require amounts of atropine far in excess of doses usually employed in medical practice. The therapeutic objective is to achieve atropinisation, as evidenced by dilation of the pupils, drying secretion, pulse rate of over 120/min and flushing skin. To prevent gastrointestinal absorption in the unconscious who have swallowed this product, perform stomach lavage using bicarbonate solution and activated charcoal.

In **less severe** cases begin with 2 mg atropine intravenously for adults, or 0.05 mg atropine/kg body weight for children under 12 years of age and repeat administration of the drug at 15 to 30 min intervals.

In **severe cases** a total atropine dose of 20 to 80 mg in the first hour may be necessary, with repeated drug administration at 3 to 10 min intervals. When signs of atropinisation appear, the dose and frequency of administration should be reduced to a schedule that will maintain full atropinisation for at least 24 hours. Overdosage with atropine is rarely serious, but underdosage may be fatal in poisoning with organophosphorous compounds. In any severe progressive case of poisoning a cholinesterase reactivator e.g. pralidoxime (2PAM), if available, should be administered, preferably within 8 hours after intoxication. An average dose is 1 g for an adult (up to 50 mg/kg for children), usually given half as a single intramuscular or intravenous injection and the other half as an intravenous infusion with glucose and or saline. In severe cases this treatment may be repeated in 1 to 2 hours, then at 10 to 12 hour intervals if needed, but not beyond 24 hours, or 48 hours at the most. Pralidoxime should be administered very slowly. If respiration is depressed during or after injection, pulmonary ventilation should be assisted mechanically.

Toxogonin is a more recent cholinesterase reactivator. It can be administered instead of 2PAM at a dose of 250 mg intramuscularly for adults (4 to 8 mg/kg for children) and, if necessary, repeat after 1 to 2 hours.

Diazepam should be included in the therapy of severe cases and whenever convulsions appear. Doses of 5 to 10 mg for adults (2 to 5 mg for children) can be administered intravenously or subcutaneously or per rectum, and repeated as required.

IMPORTANT

Because of their respiratory-depressant effects, **morphine** and similar drugs are **contraindicated** for patients poisoned with organophosphorous compounds. **Avoid aminoglycosides** and **succinylcholine**, which have a blocking effect on the neuromuscular junction.

Phenothiazines, reserpine and theophylline are **contraindicated** in organophosphorous poisoning.

5. FIRE FIGHTING MEASURES

Fire and explosion hazard:
Non-flammable. Decomposes with heat.

Extinguishing agents:
Extinguish small fires with carbon dioxide, dry powder, or alcohol-resistant foam. For larger fires, use water spray, fog or standard foam.

Firefighting:
Move containers from fire area if possible. Fight fire from maximum distance. Stay away from storage tank ends. Contain fire control water for later disposal. Do not scatter material, extinguish only if flow can be stopped. Use flooding amounts of water as a fog. Solid streams may be ineffective. Cool containers with flooding amounts of water as far a distance as possible. Use water spray to absorb toxic vapours. Avoid breathing toxic vapours. Keep upwind. Consider evacuation of downwind area if material is leaking.

Personal protective equipment:
Fire may produce irritating or poisonous vapours. Fire fighters and others that may be exposed should wear full protective clothing and self-contained breathing apparatus.

6. ACCIDENTAL RELEASE MEASURES (SPILLAGE)

Personal precautions:
Avoid contact with skin and eyes. Do not breathe in dust or fumes. For personal protection see Section 8.

Environmental precautions:
Do not allow entering drains or watercourses. When the product contaminates public waters, inform appropriate

authorities immediately in accordance with local regulations.

Occupational spill:

Do not touch spilled material. Stop leak if you can do so without risk. Use water spray to reduce vapours (contain any water used). Neutralise with sodium hydroxide and allow standing for 4 hours. For small spills, sweep up with sand or other suitable absorbent material, and place into containers for later disposal. Move containers from spill area. For larger spills, contain material far ahead of spill for later disposal. Keep spectators away. Isolate hazard area and deny entry. Ventilate closed spaces before entering.

7. HANDLING AND STORAGE REQUIREMENTS

Handling:

Highly toxic by absorption or if swallowed. Avoid contact with eyes, prolonged contact with skin, and inhalation of dust and vapour. Use with adequate ventilation. Wash hands before eating, drinking, chewing gum, smoking, or using the toilet. Remove clothing immediately if the insecticide gets inside. Then wash skin thoroughly using a non-abrasive soap and put on clean clothing. Do not apply directly to areas where surface water is present, or to intertidal areas below the mean high water mark. Water used to clean equipment must be disposed of correctly to avoid contamination.

Storage:

The product must be kept under lock and key. Keep out of reach of unauthorised persons, children and animals. Store in its original labelled container in shaded, well-ventilated area, away from heat, sparks and other sources of ignition. Not to be stored next to foodstuffs and water supplies. Local regulations should be complied with.

8. EXPOSURE CONTROL / PERSONAL PROTECTION

It is essential to provide adequate ventilation. The measures appropriate for a particular worksite depend on how this material is used and on the extent of exposure. Ensure that control systems are properly designed and maintained. Comply with occupational safety, environmental, fire, and other applicable regulations.

PERSONAL PROTECTIVE EQUIPMENT:

If engineering controls and work practices are not effective in controlling exposure to this material, then wear suitable personal protective equipment including approved respiratory protection.

Respirator:

An approved respirator suitable for protection from dusts and mists of pesticides is adequate. Limitations of respirator use specified by the approving agency and the manufacturer must be observed.

Clothing:

Employee must wear appropriate protective (impervious) clothing and equipment to prevent repeated or prolonged skin contact with the substance.

Gloves:

Employee must wear appropriate synthetic protective gloves to prevent contact with this substance.

Eye protection:

The use of full-face protection is recommended.

***Emergency eyewash*:** Where there is any possibility that an employee's eyes may be exposed to this substance, the employer should provide an eye wash fountain or appropriate alternative within the immediate work area for emergency use.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:

Light yellow liquid.

Odour:

Characteristic sulphurous odour.

Relative density:

1.044 g/cm^3.

Storage stability:

Considered stable for a period of 2 years in normal air, warehouse and light conditions.

Solubility in organic solvents:

(All solubility figures in g/ℓ at 20^{o}C for technical)

dichloromethane	>200
isopropanol	50-100
hexane	50-100
toluene	50-100

Flashpoint:

76 to 88 ^{o}C.

10. STABILITY AND REACTIVITY

Stability:

Hydrolyzes slowly at pH 7 or below, but otherwise stable at normal temperatures. Decomposes at temperatures above 120^{o}C.

11. TOXICOLOGICAL INFORMATION

Acute oral LD_{50}:

6 to 30 mg/kg for rats.

Acute dermal LD_{50}:

14 to 42 mg/kg in rabbits.

Acute eye irritation:

Non-irritating to eyes (rabbits).

Acute skin irritation:

May cause thickening and roughening of skin, but not sensitization.

Reproductive, Teratogenic and Mutagenic Effects:
Parathion crosses the placenta, does not cause birth defects. Dietary doses of parathion failed to produce dominant lethal effects in mice.

Carcinogenicity:
Possible carcinogen.

12. ECOLOGICAL INFORMATION

Degradability:
Binds tightly to soil particles and is degraded by biological and chemical processes within several weeks. Photodegradation may occur on soil surfaces.

Accumulation:
Parathion does not accumulate in the soil and non-cumulative in mammals.

ECOTOXICOLOGY:
Extremely toxic to birds. Moderately toxic to fish aquatic invertebrates.

(*Data for technical*):

Fish:

LC_{50} (96 hours):	rainbow trout:	1.5 mg/ℓ
	golden orfe:	0.58 mg/ℓ

Bees: Toxic to bees.

Earthworms:

LC_{50}:	*Eisenia foetida*	267 mg/kg dry soil

Daphnia: LC_{50} (48 hours): 0.0025mg/ℓ

13. DISPOSAL CONSIDERATION

Pesticide disposal:
Contaminated absorbents, used containers, surplus product, etc., should be burnt at 1000°C in an incinerator, preferably designed for pesticide disposal, or buried in designated landfill. Hydrolysis under alkaline conditions (e.g. sodium hydroxide) is a suitable method to dispose of small quantities of the product. After hydrolysis, dilute and dispose of via the sewage system. 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 or in specified landfill sites. **TRIPLE RINSE** empty containers in the following manner: Invert the empty container over the spray or mixing tank and allow draining for at least 30 seconds after the flow has slowed down to a drip. Thereafter rinse the container three times with a volume of water equal to a minimum of 10 % of that of the container. Add the rinsing to the contents of the spray tank before destroying the container in the prescribed manner.
Do not re-use the empty container for any other purpose but destroy it by perforation and flattening and bury in an approved dumpsite. Prevent contamination of food, feedstuffs, drinking water and eating utensils.
Comply with any local legislation applying to disposal.

14. TRANSPORT INFORMATION

UN NUMBER:	3018
ADR/IRD:	6.1
IMDG/IMO:	6.1
ICAO/IATA:	6.1
PACKAGING GROUP:	II
ROAD/RAIL:	Organophosphorous pesticide, liquid, toxic,.(parathion).
AIR/IATA:	609, Y609 Organophosphorous pesticide, liquid, toxic,.(parathion).
SEA:	Organophosphorous pesticide. liquid, toxic,.(parathion).

Severe marine pollutant.

15. REGULATORY INFORMATION

Symbol:	T+, N
Indication of danger:	Very toxic. Dangerous for the environment.

Risk phrases:

R 26/27/28	Very toxic by inhalation, in contact with skin and if swallowed.
R 50/53	Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment

Safety phrases:

S 1/2	Keep locked up and out of reach children.
S 23	Do not breathe vapour or spray.
S36/37	Wear suitable protective clothing and gloves.
S45	In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
S60	This material and its container must be disposed of as hazardous waste.
S 61	Avoid release to the environment. Refer to special instructions.

16. PACKING AND LABELLING

Packed in fluorinated 5, 20 and 25 ℓ plastic containers and labelled according to South African regulations and guidelines.

17. OTHER INFORMATION

All information and instructions provided in this Material Safety Data Sheet (MSDS) are based on the current state of scientific and technical knowledge at the date indicated on the present MSDS and are presented in good faith and believed to be correct. This information applies to the PRODUCT AS SUCH. In case of new formulations or mixes, it is necessary to ascertain that a new danger will not appear.

It is the responsibility of persons in receipt of this MSDS to ensure that the information contained herein is properly read and understood by all people who may use, handle, dispose or in any way come in contact with the product. If the recipient subsequently produces formulations(s) containing this product, it is the recipients sole responsibility to ensure the transfer of all relevant information from this MSDS to their own MSDS.

18. REFERENCES

- Applicable own physical and chemical, toxicity and ecotoxicity research studies.
- *The Pesticide Manual;* Eleventh Edition; Editor, Clive Tomlin; Crop Protection Publications, 1997.
- *Pestline*. Material Safety Data Sheets for Pesticides and Related Chemicals, Volume II, Occupational Health Services Inc.; 1991.
- *Agriculture and Public Health*; Guide to the Treatment of Poisoning by Chemicals, 1993

END OF DOCUMENT

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