

## UNIVERSAL PROFENFOS

## MATERIAL SAFETY DATA SHEET

### 1. IDENTIFICATION OF THE SUBSTANCE

**Product Name:** PROFENFOS  
 Insecticide  
**UN No.:** 3017  
**Supplier:** Universal Crop Protection (Pty) Ltd.  
**Co. Reg. No.:** 1983/008184/07  
 PO Box 801,  
 Kempton Park, 1620, South Africa  
**Telephone:** (011) 396 2233  
**Fax:** (011) 396 4666  
**Website:** [www.villacrop.co.za](http://www.villacrop.co.za)

**Emergency telephone numbers:**

**24 Hr Transport / Spill emergency no:**  
 Envirosure. +27 31 205 4918  
 (Hazcall24) +27 86 044 4411  
 (Client: Villa Crop Protection)  
 Griffon Poison Information Centre +27 82 446 8946  
 (Client: Villa Crop Protection)

**Poisoning Emergency telephone numbers:**

Griffon Poison Information Centre +27 82 446 8946  
 Poisons Information Centre +27 861 555 777

**Villa Crop Protection Emergency number:**

**National Safety, Health and Environmental Manager:**  
 +27 63 698 0668

### 2. COMPOSITION / INFORMATION ON INGREDIENTS

**Common Name:** Profenofos  
**Chemical Name:** O-4-bromo-2-chlorophenyl O-ethyl S-propyl phosphorothioate (IUPAC)  
**CAS No.:** 41198-08-7  
**Chemical family:** Organophosphate  
**Chemical formula:** C<sub>11</sub>H<sub>15</sub>BrClO<sub>3</sub>PS (Mol. wt.: 373.6)  
**Use:** Non-systemic insecticide and acaricide with contact and stomach action. Exhibits a translaminar effect. Have ovicidal properties.  
**Formulation:** Profenofos 500 g/l Emulsifiable Concentrate  
**Hazardous Component:** Profenofos  
**Symbols:** Xn  
**Risk-Phrases:** R 10-20/21-34/36/37/38/65

### 3. HAZARD IDENTIFICATION

**Toxicity class:**

WHO (a.i.) II; EPA (formulation) II

Profenofos is a compound, which inhibits cholinesterase enzyme activity in the nervous tissue. It is considered harmful. Contact with skin, inhalation of fume or spray, or swallowing may be fatal. Very toxic to fish, daphnia and algae. Very toxic to bees. Toxic to birds.

**Likely routes of exposure:**

May be absorbed from the gastrointestinal tract, through the intact skin, and through inhalation of fine spray mist.

**Eye contact:**

Irritating to eyes.

**Skin contact:**

Harmful, due to possible absorption. Irritating to skin. May cause sensitization by skin contact.

**Ingestion:**

Toxic by ingestion. See point 4 for symptoms.

**Inhalation:**

Toxic by inhalation depends on volatility of compound. See point 4 for symptoms.

### 4. FIRST AID MEASURES AND PRECAUTIONS

The clinical picture of organophosphorus intoxication results from accumulation of acetylcholine at nerve endings. The symptoms can be summarized in three groups as follows:

a) Muscarinic

- increased bronchial secretion, excessive sweating, salivation, and lacrymation;
- pinpoint pupils, bronchoconstriction, abdominal cramps (vomiting and diarrhoea);
- bradycardia.

b) Nicotinic manifestations

- fasciculation of fine muscles and, in more severe cases, of diaphragm and respiratory muscles;
- tachycardia.

c) Central nervous system manifestations

- headache, dizziness, restlessness, and anxiety;
- mental confusion, convulsions, and coma;
- depression of the respiratory center.

All these symptoms can occur in different combinations and can vary in time of onset, sequence, and duration, depending on the chemical, dose, and route of exposure. Mild poisoning might include muscarinic and nicotinic signs only. Severe cases always show central nervous system involvement; the clinical picture is dominated by respiratory failure, sometimes leading to pulmonary oedema, due to the combination of the above-mentioned symptoms.

Clinical diagnosis is relatively easy and is based on:

- a) medical history and circumstances of exposure;
- b) presence of several of the above-mentioned symptoms, in particular, bronchoconstriction and pinpoint pupils not reactive to the light. Pulse rate is not of diagnostic value,

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because the Ache effects on the heart reflect the complex innervation of this organ. On the other hand, since changes in the conduction and excitability of the heart might be life threatening, monitoring should be performed. Symptoms of profenfos intoxication are the one of cholinesterase inhibition and can include headache, dizziness, blurred vision, nausea, cramps, diarrhea, discomfort in the chest, nervousness, sweating, tearing, salivation, pulmonary oedema, convulsion, coma. If swallowed and aspirated into the lungs, chemical pneumonia can occur.

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.

### First Aid:

Remove the affected person from the danger zone to a well-ventilated room or to fresh air, and keep-affected person warm and at rest. In the case of suspected poisoning; immediately call a physician.

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.

Emergency personnel should wear gloves and avoid contamination.

### Inhalation:

Maintain airway and blood pressure and administer oxygen if necessary. Treat symptomatically and supportively. Qualified personnel should perform administration of oxygen. **Seek medical advice immediately.**

### Skin contact:

Remove contaminated clothing, shoes and leather goods immediately. Gently wipe of excess chemical. Wash skin gently and thoroughly with water and non-abrasive soap, followed by alcohol. Seek medical advice if necessary. Persons who become sensitized may require specialized 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.** If the person is alert and

respiration is not depressed, administer medicinal charcoal in a large quantity of water. Never give anything by mouth to an unconscious person. Establish and maintain airway. Treat respiratory difficulty with artificial respiration and oxygen. Do not give morphine, aminophylline, phenothiazines, reserpine, furosemide, or ethacrynic acid. Treat symptomatically and supportively. Qualified medical personnel must perform administration of oxygen and lavage.

### Advice to physician:

Atropine must be administered as early as possible 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 that have swallowed this product, perform stomach lavage using 5% sodium bicarbonate followed by activated charcoal. Establish and maintain airway and tissue oxygenation by aspiration of secretions.

Administer atropine sulfate intravenously, or intramuscularly if IV injection is not possible. In moderately severe poisoning administer atropine sulfate, 0.4-2.0 mg repeated every 15 minutes until atropinization is achieved (tachycardia, flushing, dry mouth, mydriasis). Maintain atropinization by repeated doses for 2-12 hours, or longer, depending on the severity of poisoning. Severely poisoned individuals may exhibit remarkable tolerance to atropine. Two or more times the dosage suggested above may be needed.

In case of severe poisoning by organophosphate pesticides in which respiratory depression, muscle weakness and twitchings are severe, give pralidoxime (Protopam-ayerst, 2-PAM), 1.0 gram intravenously at no more than 0.5 gram per minute. Dosage of pralidoxime may be repeated in 1-2 hours, then at 10-12 hour intervals if needed. In very severe poisonings, dosage rate may be doubled.

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.

### NOTE

Because of their respiratory-depressant effects, **morphine** and similar drugs are **contra-indicated** for patients poisoned with organophosphorous compounds. **Avoid aminoglycosides** and **succinylcholine**, which have a

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blocking effect on the neuromuscular junction. **Phenothiazines, reserpine and theophylline** are **contraindicated** in organophosphorous poisoning.

apparatus. If safe disposal is not possible, contact the manufacturer, the dealer or local representative.

### 5. FIRE FIGHTING MEASURES

**Fire and explosion hazard:**

Combustible. May evolve toxic fumes in a fire.

**Extinguishing agents:**

Extinguish fires with carbon dioxide, dry powder, or alcohol-resistant foam. When water spray is used, do not use direct water jet.

**Fire fighting:**

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. Prevent the contaminated extinguishing agent from seeping into ground or from spreading uncontrollably.

**Personal protective equipment:**

Fire may produce irritating or poisonous vapours, mists or other products of combustion. 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 mist 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. Do not contaminate waters and sewers. Prevent material from spreading. Keep away from sources of ignition. Stop leak if you can do so without risk. Soak up with suitable absorptive material or sand, and place into specially marked 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. Use protective clothing and self-containing breathing

### 7. HANDLING AND STORAGE REQUIREMENTS

**Handling:**

Harmful and toxic by absorption, or if swallowed or inhaled. Avoid contact with eyes, prolonged contact with skin, and inhalation of mist 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 unauthorized persons, children and animals. Store in its original labeled container in shaded, well-ventilated dry 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 work site 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:**

Wear an approved respirator suitable for protection from dusts and mists of pesticides. Limitations of respirator use specified by the approving agency and the manufacturer must be observed. In case of heavy exposure, wear a gas mask with universal filter.

**Clothing:**

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

**Gloves:**

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

**Eye protection:**

The use of full-face protection is recommended.

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**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.

**After use/work:**

Wash thoroughly (shower, bath, wash hair). Change clothing. Thoroughly clean protective gear. Thoroughly clean contaminated equipment with soap or soda.

### 9. PHYSICAL AND CHEMICAL PROPERTIES

**Appearance:**

Yellowish to light brown clear liquid.

**Odour:**

Weakly like cooked onions.

**Relative density:**

1,13 g/cm<sup>3</sup> ± 0,010

**Boiling point:**

>180 °C

**Flashpoint:**

48 °C (Tag closed cup)

**Flammability:**

Flammable.

**Storage stability:**

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

**Solubility in water:**

Perfectly miscible with water. Gives a stable emulsion.

**pH:**

5 to 7 at 25 °C

### 10. STABILITY AND REACTIVITY

**Stability:**

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

**Incompatibility:**

Avoid humidity.

**Hazardous decomposition:**

Emits toxic fumes under fire conditions. CO, CO<sup>2</sup>, chloride and hydrogen bromide, phosphoric acid and phosphorous pentoxide.

### 11. TOXICOLOGICAL INFORMATION

**Acute oral LD<sub>50</sub>:**

1500 mg/kg (rat.)

**Acute dermal LD<sub>50</sub>:**

>2000 mg/kg (rat)

**Acute inhalation LC<sub>50</sub>:**

LC<sub>50</sub> (4h) for rats > 5 mg/m<sup>3</sup> air.

**Acute skin/eye irritation:**

Highly skin irritant to rabbits. Moderately eye irritant to rabbits. Weak skin sensitization to guinea pigs.

**Carcinogenicity, Teratogenicity, Mutagenicity:**

Not carcinogenic.

**ADI on human:**

0.01 mg/kg (active ingredient)

### 12. ECOLOGICAL INFORMATION

**Degradability:**

Rats rapidly excrete <sup>14</sup>C-profenofos after oral administration. The predominant metabolic pathway involves stepwise dealkylation and hydrolysis, followed by conjugation.

In cotton, Brussels sprouts and lettuce, the compound is rapidly taken up and metabolized. The overall metabolic pattern indicates degradation to polar metabolites.

Mean half-life in soil is c.1w.

**ECOTOXICOLOGY: Data for technical material:**

**Birds:** Very toxic.

LC <sub>50</sub> (2 days):	Mallard duck:	300 ppm
LC <sub>50</sub> (8 days):	Bobwhite quail:	70 to 200 ppm
	Mallard duck:	150 to 612 ppm
	Japanese quail:	>1000 ppm

**Fish:** Very toxic.

LC <sub>50</sub> (96 hours):	Rainbow trout:	0.2 mg/ℓ
	Bluegill sunfish:	0.7 mg/ℓ
	Crucian carp:	0.09 mg/ℓ

**Bees:** Very toxic to bees.

**Other:**

Very toxic to crustaceans, algae and daphnia.

This product is very toxic for the environment and especially for aquatic organisms.

### 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. Avoid contamination of surface and ground water, water supplies and drains. Heavily contaminated soil layers have to be dug out down to clean soil. Comply with local legislation applying to waste disposal.

**Container disposal:**

Emptied containers retain vapour and product residues. Observe all labelled safeguards until container is destroyed.

**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

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a third 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 local legislation applying to waste disposal.

### 14. TRANSPORT INFORMATION

**UN NUMBER:** 3017  
**ADR/RID:**  
 Substance ID NR: 3017  
 Hazard ID NR: 63  
 Class: 6.1  
 Subsidiary risk: 3  
 Name: Organophosphorus pesticide, liquid, toxic, flammable, (profenofos).

#### AIR/IATA:

Class: 6.1  
 Subsidiary Risk: 3  
 Hazard Label: Toxic & flammable liquid  
 Packaging group: III  
 Passenger aircraft: Y611 (max 2 l)  
 611 (max 60 l)

Cargo aircraft: 618 (max 220 l)

#### IMDG/IMO:

Packaging group: III  
 Label of class: 6.1  
 Subsidiary Risk: **3 MARINE POLLUTANT**  
 Shipping Name: Organophosphorus pesticide, liquid, toxic, flammable, (profenofos).

### 15. REGULATORY INFORMATION

**Symbol:** Xn: Harmful + F: flammable + N: Dangerous for the environment

#### Risk phrases:

**R 10** Flammable  
**R 20/21/22** Harmful by inhalation, in contact with skin and if swallowed.  
**R 36/38** Irritating to eyes and skin.  
**R 43** May cause sensitization by skin contact.  
**R 50** Very toxic to aquatic organisms.  
**R 57** Toxic to bees.

#### Safety phrases:

**S 1/2** Keep locked up and out of reach of children.  
**S 13** Keep away from food, drink and animal feeding stuffs.  
**S 20/21** When using do not eat, drink or smoke.

**S 24/25** Avoid contact with skin and eyes.  
**S 28** After contact with skin, wash immediately with plenty of water and soap.  
**S 36/37/39** Wear suitable protective clothing, gloves and eye/face protection.  
**S 46** If swallowed, seek medical advice immediately and show this container or label.  
**S 62** If swallowed, do not induce vomiting: seek medical advice immediately and show this container or label.

### 16. OTHER INFORMATION

#### Packing and Labeling:

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

#### Disclaimer:

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 recipient's sole responsibility to ensure the transfer of all relevant information from this MSDS to their own MSDS.

#### References:

- Applicable own physical and chemical, toxicity and ecotoxicity research studies.
- *The Pesticide Manual*; Eleventh Edition; Editor, CCDS Tomlin; Crop Protection Publications, 1997.
- *The Pesticide Manual*; Tenth Edition; Editor, CDS Tomlin; Crop Protection Publications, 1994.
- *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

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### ***END OF DOCUMENT***

**Compiled:** January 2002  
**Reviewed:** April 2019  
**Revision no.:** (2)  
**Next revision date:** April 2024

For detailed information on revisions, contact the  
Registration holder.