

UNIVERSAL CHLORPYRIFOS 480 EC

MATERIAL SAFETY DATA SHEET

1. IDENTIFICATION OF PRODUCT AND COMPANY

Product Name: CHLORPYRIFOS 480 EC
 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

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: Chlorpyrifos
Chemical Name: O,O-diethyl O-3,5,6-trichloro-2-pyridyl phosphorothioate (IUPAC)
CAS No.: 67375-30-8
Chemical family: organophosphate
Chemical formula: C₉H₁₁Cl₃NO₃PS
Molecular weight: 350.62
Use: Non-systemic insecticide with stomach, contact and respiratory action.
Formulation: Chlorpyrifos 480 g/l Emulsifiable Concentrate
Hazardous ingredients of toxicological concern:

Ingredient	concern:	% present:
Chlorpyrifos	toxic by inhalation & ingestion	50 % w/v
xylene	harmful, irritant	40-50% w/v

Symbol: Xn, F
Indication of danger: Harmful and Flammable substance
Risk Phrases: R10, R24/25, R50, R57

3. HAZARD IDENTIFICATION

Toxicity class:
 WHO II; EPA II
 A moderately toxic insecticide.
Likely routes of exposure:
 Skin and eye contact, ingestion and inhalation.
Ingestion:
 Highly toxic by ingestion.
Inhalation:
 Moderately toxic by inhalation.
Skin contact:
 Minimally toxic. May cause mild skin irritation.
Eye contact:
 May cause moderate eye irritation.

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 that 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. These include marked meiosis, ocular pain, conjunctival congestion, diminished vision, ciliary spasm and brow ache. With **acute systemic absorption**, meiosis may not be evident due to systemic absorption; meiosis may not be evident due to sympathetic discharge in response to the hypertension. 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

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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 off 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 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 per minute, and flushing skin. To prevent gastrointestinal absorption in 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 intravenously for children under 12 years of age and repeat administration of the drug at 15 to 30 minute intervals.

In **severe cases** a total atropine dose of 20 to 80 mg in the first hour may be necessary, with repeated drug administrations at 3 to 10 minute 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 pralidoxime 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 250mg intramuscularly for adults (4 to 8 mg/kg for children) and, if necessary, repeated 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 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:

Product is highly flammable and explosive due to the solvent used.

Extinguishing agents:

Carbon dioxide, dry powder, or alcohol-resistant foam can be used to extinguish small fires. Water spray can be used for cooling of unaffected stock, but avoid water coming in contact with the product. Contain water used for fire fighting for later disposal. Avoid the accumulation of polluted run-off from the site.

Fire fighting:

Remove spectators from surrounding area. Remove container from fire area if possible. Fight fire from maximum distance. For massive fire, use unmanned hose holder or monitor nozzles. Contain fire control agents for later disposal. Use a recommended extinguishing agent for the type of surrounding fire. Water can be used to cool unaffected containers but must be contained for later disposal. Avoid inhaling hazardous vapours. Keep upwind.

Personal protective equipment:

Fire may produce irritating or poisonous vapours (toxic fumes of hydrogen cyanide, chlorine, and oxides of nitrogen and carbon), mists or other products of combustion. Fire fighters and others that may be exposed should wear full protective clothing and self-contained breathing apparatus.

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6. ACCIDENTAL RELEASE MEASURES (SPILLAGE)

Personal precautions:

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

For small spills, soak up sand or suitable non-combustible absorbent material, place into containers for subsequent disposal. Thoroughly wash body areas, which come into contact with the product. Avoid runoff to sewer as it may cause fire/explosion. Do not allow the product to come in contact with water systems. For large spills contact the manufacturer. Contain liquid far ahead of spill. Contain spillage and contaminated water for subsequent disposal. Do not flush spilled material into drains. Keep spectators away and upwind.

7. HANDLING AND STORAGE REQUIREMENTS

Handling:

Remove sources of naked flame or sparks. Harmful by inhalation or if swallowed. Avoid contact with eyes and skin and inhalation of fumes. Use with adequate ventilation. Wash hands before eating, drinking, chewing gum, smoking or using the toilet. Operators should change and wash clothing daily. 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:

Store in its original container in isolated, dry, cool and well-ventilated area. Avoid cross contamination with other pesticides and fertilisers. Keep under lock and key out of reach of unauthorised persons, children and animals. Store away from incompatible substances. Not to be stored next to foodstuffs and water supplies. Local regulations should be complied with.

8. EXPOSURE CONTROL/PERSONAL PROTECTION

Remove all sources of ignition or naked flame. It is essential to provide adequate ventilation. 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 equipment including approved respiratory protection.

Respirator:

An approved full-face respirator suitable for protection from dusts and mists of pesticides is required. 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 skin contact with the substance.

Gloves:

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

Eye protection:

Employee must wear splash-proof safety goggles and face-shield to prevent contact with this substance.

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:

Homogenous clear straw coloured liquid.

Odour:

Slight odour (aromatic solvent).

Flammability:

Flammable (due to solvent).

Flash point:

30 °C (Tag Closed Cup method).
 35 °C (Pensky Martins closed cup).

Oxidising properties:

As neither the active substance nor the formulants are oxidising, the preparation is not expected to be oxidising.

pH:

Not available.

Specific gravity:

1.069 ± 0.005 g/cm³ at 20 °C.

Storage stability:

Stable under normal storage conditions:

Dilution stability:

Stable.

Solubility in water:

Immediately forms an emulsion in water.

Solubility in organic solvents:

(All solubility figures for technical material at 25°C)
 heptane: 1213 ± 40 g/l
 acetone: 1331 ± 33 g/l

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xylene:	1341 ± 21 g/l
1,2-dichloroethane:	1388 ± 31 g/l
ethyl acetate:	1323 ± 41 g/l
1-octanol:	301 ± 8 g/l
methanol:	949 ± 60 g/l

Partition-coefficient in n-octanol / water:
 K_{ow} ($\log P_{ow}$) = 4.5 (data for technical material).
Boiling point:
 137 °C.

10. STABILITY AND REACTIVITY

Stability:
 The product is stable at room temperature in normal warehouse conditions in original packaging.

Incompatibility:
Chlorpyrifos is incompatible with alkaline materials such as Bordeaux mixture or Lime Sulphur. **Chlorpyrifos** may be incompatible with pesticides containing carboxylic acid amide groups or other strongly basic groups such as **Thiram** and **Captab**. A compatibility test is required before using with other products. Do not physically mix concentrate directly with other herbicides or pesticide concentrates; always dilute first.

Thermal decomposition:
 Product undergoes decomposition at temperature above 160 °C. Avoid heating above ambient temperature. Hydrogen chloride and organic sulphides are released when the product decomposes on heating.

11. TOXICOLOGICAL INFORMATION

Acute oral LD₅₀:
 324.64 mg/kg in rats. (calculated)

Acute dermal LD₅₀:
 4 505.44 mg/kg in rats. (calculated)

Acute inhalation LC₅₀ (4 h):
 9.79 mg/l of air in rats for technical material.

Acute skin irritation:
 Causes mild irritation.

Acute eye irritation:
 Causes moderate irritation.

Dermal sensitisation:
 This product is a non-sensitising substance to guinea pigs.

Carcinogenicity:
 Studies did not detect carcinogenic activity. No human information available. The solvent was not found to be carcinogenic.

Teratogenicity:
 (Technical) No terata were observed in the offspring of rats orally administered 1 mg/kg/day on days 6.15 of gestation.

Mutagenicity:

(Technical) No mutagenicity recorded in gene mutation test, chromosomal recombination and dominant lethal tests.

12. ECOLOGICAL INFORMATION

ECOTOXICOLOGY: (technical)

Birds:
 Toxic to birds.
 LD₅₀ for chickens: 32 to 102 mg/kg

Fish:
 Highly toxic to fish.
 Rainbow trout: LC₅₀ (96 hr): 0.007 – 0.051 mg/l
 Bluegill sunfish LC₅₀ (96 hr): 0.002 – 0.010- mg/l

Daphnia:
 Highly toxic. LC₅₀ (48 h) 1.7 µg/l

Bees:
 Toxic to bees.
 LD₅₀ (oral): 360 ng/bee
 LD₅₀ (topical): 70 ng/bee

Earthworms:
 LC₅₀ (14 d): for Eisenia foetida 210 mg/kg soil

Soil micro-organisms:
 EC/LC₅₀ mg/kg: Toxic to Collembola

Degradability: (Technical material)
 Rapidly metabolised and excreted mainly in the urine with the degradation product appearing mainly due to dealkylation. Diethyl phosphate, diethylthio phosphate and phenotic derivate were found.
 Laboratory – determined **Chlorpyrifos** soil degradation half-lives vary tremendously, and half-life estimates in different soils have ranged from **less than 10 days to greater than 120 days**. Environmental factors can greatly influence the degradation rate of **Chlorpyrifos** in soil; the most important being moisture, pH, organic content, and pesticide formulation. **Chlorpyrifos in formulation can be classified as non-persistent.**

Mobility:
Chlorpyrifos is non-mobile in soil.

Accumulation:
 Contamination of ground water is unlikely to occur by **Chlorpyrifos**, accumulation in the air or contamination by wet or dry deposition is not to be expected.

13. DISPOSAL CONSIDERATION

Open dumping or burning of this pesticide is prohibited. Never pour untreated waste or surplus products into public sewers or where there is any danger of run-off or seepage into water systems. Do not contaminate rivers, dams or any other water sources with the product or used containers.

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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 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.

14. TRANSPORT INFORMATION

UN NUMBER: 3017
Road Transport ADR/IRD:
 Class: 6.1 (3.3)
 Packing group: III
 Shipping name: Organophosphorus pesticide, liquid, toxic, flammable, (**Chlorpyrifos**).

Air Transport ICAO/IATA:
 Class: 6.1 (3.3)
 Packing group: III
 Shipping name: Organophosphorus pesticide, liquid, toxic, flammable, (**Chlorpyrifos**).

Maritime Transport IMDG/IMO:
 Class: 6.1 (3.3)
 Packing group: III
 Shipping name: Organophosphorus pesticide, liquid, toxic, flammable, (**Chlorpyrifos**).

15. REGULATORY INFORMATION

Symbol: X_n, F
Indication of danger: Harmful and **Flammable substance**

Risk phrases:
R10 Flammable.
R 24/25 Toxic in contact with skin and if swallowed.
R 50 Very toxic to aquatic organisms.
R 57 Toxic to Bees.

Safety phrases:
S 1 Keep locked up.
S 2 Keep out of reach of children.
S 16 Keep away from sources of ignition – No smoking.
S 23 Do not breathe vapour/spray.
S 24/25 Avoid contact with skin and eyes.

S 28 After contact with skin, wash immediately with plenty of water and non-abrasive soap.
S 36/37/39 Wear protective clothing, gloves and eye/face protection.
S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

16. OTHER INFORMATION

Packaging:
 Packed in 5, 10, 20, 25 and 200 litres fluorinated plastic containers and labelled according to South African regulations and guidelines.

Disclaimer:
 The information on this sheet is not a specification; it does not guarantee specific properties. The information is intended to provide general guidance as to health and safety based upon our knowledge of the handling, storage use of the product. It is not applicable to unusual or non-standard uses of neither the product nor where instructions or recommendations are not followed.

All information is given in good faith but without guarantee in respect of accuracy, and no responsibility is accepted for errors and omissions or the consequence thereof.

END OF DOCUMENT

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For detailed information on revisions, contact the Registration holder.