

UNIVERSAL DIMETHOATE 400 EC

MATERIAL SAFETY DATA SHEET

1. IDENTIFICATION OF PRODUCT AND COMPANY

Trade Name: DIMETHOATE 400 EC
 Insecticide and Acaricide
UN No: 3017
Supplier: Universal Crop Protection (Pty) Ltd.
Co. Reg. No.: 1983/008184/07
 PO Box 10413,
 Aston Manor, 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: Dimethoate (BSI, E-ISO, ESA, F-ISO, JMAF) Fosfamid (USSR)
Chemical name: O,O-dimethyl S-methylcarbamoylmethyl phosphorodithioate (IUPAC)
CAS No.: [60-51-5]
Chemical Family: Organophosphate
Chemical Formula: C₅H₁₂NO₃PS₂ (Mol. wt.: 229.3)
Use: Systemic insecticide and acaricide with contact action.
Formulation: Dimethoate: 400 g/l Emulsifiable Concentrate
Hazardous components: Dimethoate
SYMBOL: Xn, F, N
Indication of danger: Harmful, Environmentally dangerous, Flammable, S
Risk Phases: R10, R20/21/22, R51/53
Safety phrases: S1/2, S13, S20/21, S28, S36/37, S61

3. HAZARD IDENTIFICATION

Toxicity class: WHO Ib; EPA II
ADI: 0.002 mg/kg
NOEL: 5.0 mg/kg (rats)
 2 years (0.2 mg/kg daily)
Main Hazard: 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.
Fire and explosion hazard: Product is **Flammable** and explosive due to the solvent. Refer section 9.

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 bronchoconstriction 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.

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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 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 that 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 minutes 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. Over dosage with atropine is rarely serious, but under dosage 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 250 mg 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.

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

Extinguishing agents: Extinguish small fires with carbon dioxide, dry powder, or alcohol-resistant foam. Water spray can be used for cooling of unaffected stock, but avoid water coming in contact with the product. Contain water used for firefighting for later disposal.

Avoid the accumulation of polluted run-off from the site.

Firefighting: 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.

Special Hazards: Fire may produce irritating or poisonous mists (hydrogen sulfide, carbon oxides and sulfur oxides) or other products of combustion.

Personal protective equipment: 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: Do not inhale fumes. Ventilate area of spill or leak, especially confined areas. Avoid

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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 (avoid temperatures above 40°C) and well-ventilated area. Avoid cross contamination with other pesticides and fertilizers. Product hydrolysed rapidly in aqueous alkaline solutions. 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

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

Engineering control 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.

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 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 eye wash: 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: Yellow liquid.

Flammability: Flammable.

Ignition temperature: 295 °C.

Flash point: 41 to 44 °C.

Relative density: 1.05 to 1.08 g/l at 20°C.

pH: 0.1 %: 5.5 to 7.5

Storage stability: Stable for up to 2 years under normal warehouse and field conditions.

Solubility in water: Not soluble; emulsifies in water.

Solubility in organic solvents: (All solubility figures for technical material at 25°C)

Soluble in most organic solvents (e.g. alcohols, ketones, benzene, toluene, chloroform etc)

Partition-coefficient in n-octanol / water: K_{ow} ($\log P_{ow}$) = 0.704 (data for active substance).

10. STABILITY AND REACTIVITY

Stability: The product is stable in aqueous media at pH 2 to 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 sulphur-based formulations.

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Do not physically mix concentrate directly with other herbicides or pesticide concentrates; always dilute first.

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

11. TOXICOLOGICAL INFORMATION

Acute oral LD₅₀: 387 mg/kg body weight in rats.
Acute dermal LD₅₀: >2000 mg/kg in rabbits.
Acute inhalation LC₅₀ (4 h): >1.6 mg/ℓ air (*Data on the Active ingredient*)
Acute skin irritation: Non- irritant.
Acute eye irritation: Mild irritant for the eyes.
Dermal sensitisation: No information currently available
Carcinogenicity: Studies did not detect carcinogenic activity. No human information available.
Teratogenicity / Reproductive hazard: Studies did not detect any tetragenic effects. No human information available.
Mutagenicity: Studies indicated that mutagenic activity.

12. ECOLOGICAL INFORMATION

ECOTOXICOLOGY: Birds: Toxic to birds.
Fish: Toxic to fish. LC₅₀ (96h): 6.2 mg/ℓ (Rainbow trout)
Daphnia: Toxic to daphnia. LC₅₀ (24h): 4.7 mg/ℓ
Bees: Toxic to bees. LC₅₀ (oral and topical): 0.1 to 0.2 µg/ℓ
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/loamy sand).
 This product in formulation can be classified as non-persistent.
 DT₅₀ aerobic: 2 to 4.1 days.
 DT₅₀ photolytic on soil surface: 7 to 16 days.

13. DISPOSAL CONSIDERATION

Pesticide disposal: Contaminated absorbents, surplus product, etc., should be burned in a high-temperature incinerator (> 1000 °C) 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.

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.

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.

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.

14. TRANSPORT INFORMATION

UN NUMBER: 3017
ADR/RID:
 Hazard ID NR: 63
 Label: 6.1 + 3
 Item no: 72
AIR/IATA:
 Proper shipping name: Organophosphorous pesticide, liquid, toxic, **Flammable (Dimethoate)**
 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)**
 Packaging group: III

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Label of class: 6.1. Subsidiary Risk: 3
Considered a marine pollutant.

For detailed information on revisions, contact the Registration holder.

15. REGULATORY INFORMATION

Symbol: Xn, F, N
Indication of danger: Harmful, **Flammable,**
 Environmentally dangerous
 substance.

Risk phrases:

R 10 Flammable.
R 20/21/22 Harmful by inhalation, in contact with skin and if swallowed.
R 51/53 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 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 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.

16. OTHER INFORMATION

Packing and Labelling: Packed in 5, 10, 20, and 25 litres fluorinated plastic containers and labelled according to the 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 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

Compiled: February 2008
Revised: March 2019
Revision no: (3)
Next revision: March 2024