

FARM-AG INTERNATIONAL (Pty) Ltd

P.O. Box 1523, Durban 4000

Head Office : 61 Marshall Dr., Old Mill Industrial Park, Mount Edgecombe **South Africa**

Registration Number: 2005/011761/07

Tel + 27 31 003 3486 • Fax + 27 31 502 5825

SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

Product Name: Agfuran 10 G
Product Use: Insecticide
Creation Date: November 2013
Revision Date: September 17

24 Hr Emergency Number: 082 771 2712

In case of poisoning:

Poison Information Centre: 082 446 8946
 Tygerberg Hospital: (021) 931 6129
 Poison Emergency Enquiries (021) 689 5227

In case of Spillage:

HAZMAT: 0800 147 112

SECTION 2 - COMPOSITION / INFORMATION ON INGREDIENTS

Active ingredient Carbofuran
Chemical Name: 2,3-dihy-2,2-dimethylbenzofuran-7-yl methylcarbamate (IUPAC)
CAS No. 1563-66-2
Chemical Family: Carbamate
Chemical Formula C₁₂H₁₅NO₃ (Mol. Wt.: 221.26)
NIOSH/RTECS no. FB 9450000
UN no. 2757
Hazchem class 6.1
Use Insecticide, Nematicide And Acaricide

SECTION 3 - HAZARD IDENTIFICATION

Hazardous components Carbofuran 100 g/kg
EEC no. 216-353-0
EEC classification T+,N
Risk-Phrases R 26/28,R50/53
Toxicity class: WHO II
Main hazard: Carbofuran is a carbamate compound which inhibits cholinesterase. It is of very high toxicity. Contact with skin, inhalation of dust or spray, or swallowing may be fatal. Toxic to fish and bees.
Flammability: Not flammable.
Biological hazards: May be absorbed from the gastrointestinal tract, through the intact skin, and through inhalation of fine spray mist or dust.
Eye contact: Highly toxic. Mildly irritating to eyes.
Skin contact: Highly toxic. Mildly irritating to skin.
Ingestion: Highly toxic by ingestion. See point 4 for symptoms.
Inhalation: Highly toxic by inhalation. See point 4 for symptoms.

SECTION 4 - FIRST AID MEASURES AND PRECAUTIONS

Proper care should be taken during occupational uses to avoid any inhalation of dust and spray particles, and to prevent accidental contamination of food products and water.

Inhalation:Acute exposure:

When inhaled, the first effects of cholinesterase inhibition are usually respiratory and may include nasal hyperaemia and watery discharge, chest discomfort, dyspnea and wheezing due to increased bronchial secretions and bronchoconstriction. Other systemic effects may begin within a few minutes or several hours of exposure. Symptoms may include nausea, vomiting, diarrhoea, abdominal cramps, headache, vertigo, ocular pain, ciliary muscle spasm, blurring or dimness of vision, miosis, or in some cases mydriasis, lacrimation, salivation, sweating and confusion. Other reported central nervous system or neuromuscular effects include ataxia, slurred speech, weakness, fatigue, twitching,

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fasciculation, tremor, and eventually paralysis of the extremities and possibly of the respiratory muscles. In severe cases, there may also be involuntary defecation and urination, bradycardia, hypotension, pulmonary oedema, convulsions, coma and death from respiratory failure or cardiac arrest. Carbofuran does not accumulate in mammalian tissue and the cholinesterase inhibition reverses rather rapidly. In non-fatal cases, the illness generally lasts less than 24 hours.

Chronic exposure:

Prolonged or repeated exposure may cause effects as described in acute exposure.

First aid:

Remove from exposure area to fresh air immediately. If breathing has stopped, give mechanical artificial respiration (not direct mouth-to-mouth). Maintain airway and blood pressure and administer oxygen if available. Keep affected person warm and at rest. Treat symptomatically and supportively. Administration of oxygen should be performed by qualified personnel. Get medical attention immediately.

Skin contact:

Acute exposure:

Some compounds may cause irritation. Localized sweating and fasciculations may occur at the site of contact. If sufficient amounts are absorbed through the skin, other effects of cholinesterase inhibition may occur as described in acute inhalation. Symptoms may be delayed for 2-3 hours, usually no more than 8 hours.

Chronic exposure:

Repeated or prolonged exposure may cause effects as described in acute exposure.

First aid:

Remove contaminated clothing immediately. Wash contaminated areas with soap and water followed by alcohol. Emergency personnel should wear gloves and avoid contamination. Treat respiratory difficulty with mechanical artificial respiration. Get medical attention immediately.

Eye contact:

Acute exposure:

Direct contact may cause pain, hyperaemia, lacrimation, twitching of the eyelids, miosis and ciliary muscle spasm with loss of accommodation, blurred or dimmed vision and browache. Sometimes mydriasis may occur instead of miosis. With sufficient exposure, other symptoms of cholinesterase inhibition may occur as described in acute inhalation.

Chronic exposure:

Prolonged exposure may cause effects as described in acute exposure. Some compounds have caused toxic effects on the crystalline lens, conjunctival thickening and obstruction of nasolacrimal canals when used as miotic drops.

First aid:

Irrigate eyes with water or saline solution. If symptoms of poisoning occur, treat respiratory difficulty with mechanical artificial respiration and oxygen. Observe patient for at least 24-36 hours. Get medical attention immediately. Oxygen should be administered by qualified medical personnel.

Ingestion:

Acute exposure:

When ingested, the first effects may be nausea, vomiting, anorexia, abdominal cramps and diarrhoea. With absorption from the gastrointestinal tract, the other effects of cholinesterase inhibition as described in acute inhalation may occur. Symptoms may begin within minutes or be delayed several hours.

Chronic exposure:

Repeated ingestion may cause effects as described in acute exposure.

First aid:

If person is alert and respiration is not depressed, give syrup of Ipecac followed by water (if vomiting occurs, keep head below hips to prevent aspiration). If consciousness level declines or vomiting has not occurred in 15 minutes empty stomach by gastric lavage with aid of cuffed endotracheal tube using isotonic saline or 5% sodium bicarbonate follow with activated charcoal. Establish and maintain airway. Treat respiratory difficulty with artificial respiration and oxygen.

Do not give morphine, aminophylline, phenothiazines, reserpine, furosemide, or ethacrynic acid. Drugs like 2PAM are not effective in poisoning with Carbofuran. THEY SHOULD NOT BE USED.

Treat symptomatically and supportively. Administration of oxygen and gastric lavage must be performed by qualified medical personnel. Get medical attention immediately.

Further Medical treatment:

Advice to physician:

Antidote

The following antidote has been recommended. However, the decision as to whether the severity of poisoning requires administration of any antidote and actual dose required should be made by qualified medical personnel.

For cholinesterase inhibitors: Establish clear airway and tissue oxygenation by aspiration of secretions, and if necessary, by assisted pulmonary ventilation with oxygen. Improve tissue oxygenation as much as possible before administering atropine to minimise the risk of

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ventricular fibrillation. Administer atropine sulphate intravenously, or intramuscularly if injection is not possible. In moderately severe poisoning administer atropine sulphate, 0.4-2.0 mg repeated every 15minutes, 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. The appearance of rales in the lung bases, miosis, salivation, nausea, bradycardia, are all indications of inadequate atropinization. Severely poisoned individuals may exhibit remarkable tolerance to atropine. Two or more times the dosages suggested above may be needed. Persons not poisoned or only slightly poisoned, however, may develop signs of atropine toxicity from such large dosages: fever, muscle fibrillations, and delirium are main signs of atropine toxicity. If these signs appear while the patient is fully atropinized, atropine administration should be discontinued, at least temporarily. Observe treated patients closely at least 24 hours to ensure that symptoms (possibly pulmonary oedema) do not recur as atropinization wears off. In very severe poisoning, metabolic disposition of toxicant may require several hours or days during which atropinization must be maintained. Markedly lower levels of urinary metabolites indicate that atropine dosage can be tapered off. As dosage is reduced, check the lung bases frequently for rales. If rales are heard or other symptoms return, re-establish atropinization promptly.

SECTION 5 - FIRE-FIGHTING MEASURES

Extinguishing Media:

Extinguish small fires with carbon, dry chemical, water spray or standard foam. For larger fires, use dry chemical, "alcohol" foam, Halon, or carbon dioxide to fight fire.

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. Do not get water inside the containers. For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible, withdraw from area and let fire burn. Use water spray to absorb toxic vapour. Avoid breathing toxic vapour. Keep unwind. Consider evacuation of downwind area if material is leaking.

Fire and explosion hazard:

Not flammable. Toxic dust and irritating fumes may be produced during fires.

Fire Fighting Protective Equipment:

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

SECTION 6 - ACCIDENTAL RELEASE MEASURES (SPILLAGE)

Personal precautions:

Avoid contact with skin and eyes. Do not breath in dust or fumes. For personal protection see Section 8.

Environmental precautions:

Do not allow to enter drains or water courses. When the product contaminates public waters, inform appropriate authorities immediately in accordance with local regulations.

Occupational spill:

Small spills: 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 to stand for 4 hours. Sweep up with sand or other suitable absorbent material, such as sawdust, and place into containers for later disposal. Move containers from spill area.

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.

SECTION 7 - HANDLING AND STORAGE REQUIREMENTS

HANDLING:

Highly toxic by inhalation 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 unauthorized 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.

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SECTION 8 - EXPOSURE CONTROL/PERSONAL PROTECTION**Occupational exposure limits:****NIOSH:** REL-air: 10H TWA 0.1 mg/m**ACGIH 1993-1993:** TLV: ppm; 0.1 mg/m**Engineering control measures:**

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. 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.

Personal protective equipment:**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 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.

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

Form	: granules
Color	: Violet
Odor	: Very faint phenolic odour.
Density (g/ml)	: 0.74 to 0.84 g/mlus.
Flash point	: None.
Suspensibility	: Not available.
Solubility in water	: Not soluble
Partition-coefficient in n-octanol / water:	
<i>Data as for technical material</i>	
Kow	: 17-26 at 20 degrees Celsius
Melting point	: <i>Data as for technical material.</i> >150 degrees Celsius decomposes
Explosive properties	: Non explosive
Oxidising properties	: Not corrosive
PH	: Not available
Viscosity	: Not applicable as product is a solid.
Storage stability	: Considered stable for a period of 2 years in normal air, warehouse and light conditions.
Persistent foaming	: Not applicable as product is a solid.

SECTION 10 - STABILITY AND REACTIVITY**Stability:**

Stable in acidic and neutral media, but rapidly hydrolysed in alkaline media. The rate of decomposition increases at higher temperatures.

Carbofuran is stable to light. Stable up to 130 degrees Celsius. Incompatibility:

The product is compatible with most other pesticides (except those which are alkaline) when used at normal rates. However, a compatibility test is required before using with other products. Do not physically mix concentrates directly with other herbicides or pesticide concentrates; always dilute first.

Hazardous decomposition Product(s):**Thermal decomposition:**

Toxic oxides of nitrogen are released when the product decomposes on heating.

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SECTION 11 - TOXICOLOGICAL INFORMATION**Data as for Carbofuran 5 GR:**

Acute oral LD50	: 233 mg/kg in rats.
Acute dermal LD50	: >2000 mg/kg in female rats.
Acute inhalation:	: 0.11 mg/l air
Carcinogenicity	: Animal studies did not detect any carcinogenic activity. No human information available

Teratogenicity:

Carbofuran caused teratogenic lesions in chick embryos.

*(Gosselin RE, Smith RP&Hodge HC[Eds]: Clinical Toxicology of Commercial Products, 5th ed. Williams&Wilkins, Baltimore, MD, 1984; p 11-305)*Teratogenic effects have been noted in the offspring of pregnant mice and rats exposed to carbofuran. *(Registry of Toxic Effects of Chemical Substances. National Institute for Occupational Safety and Health, Cincinnati, OH [CD-Rom Version], Micromedex, Inc, Englewood, CO, 1991).*

Mutagenicity	: Animal studies did not detect any mutagenic activity. No human information available.
Inhalation	: Rats: 0,075 mg/l of air over 4 hours (aerosol).
Skin contact	: Non irritating to skin (rabbit) -EEC method. Slight irritant to skin (rabbit) -EPA method.
Eye contact	: Non-irritant (rabbit)
Ingestion	: Considered to be a weak sensitiser.

SECTION 12 - ECOLOGICAL INFORMATION

Toxicity	: Data as for technical material
Birds	: Extremely toxic to birds. LD50 (Acute oral): 3,25 mg/kg (japanese quail).
Fish	: Moderately toxic to fish. LC50 (96h): 2.75 mg/l (Bradychydano rerio)
Bees	: Toxic to bees. LD50 (48h): 0,26 ug/bee
Daphnia	: May pose a hazard to Daphne magna.
EC50 (48h)	: 0,40 ug/l (adult immobilization test).
Earthworms	: Extremely toxic to all species of earthworms.

Degradability:In soil and water, the product degrades in 30-60 days. Degradation takes place primarily through microbial activity, with CO₂ as the principal end product. The degradation process is affected by temperature and soil pH (degradation is accelerated under alkaline conditions). A small degree of hydrolysis may take place in moist soils.**Mobility:**

Carbofuran is not resistant to leaching. Koc = 22

Accumulation:

The product is not expected to bioaccumulate. Log Pow = 1.7.

SECTION 13 - DISPOSAL CONSIDERATION**Pesticide disposal:**

Contaminated adsorbents, used containers, surplus product, etc., should be burnt at 1000 degrees Celsius 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. Metal containers must be crushed and transported to a scrap metal facility for disposal or burial in a designated landfill.

Do not contaminate rivers, dams or any other water source with chemical or used containers. Drain and triple rinse containers and then destroy by perforation and flattening. Bury in an approved dumping site.

Do not re-use containers for any other purpose.

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14. TRANSPORT INFORMATION

UN NUMBER:	2757
ADR/IRD	
Substance ID no.	2757
Shipping name:	Carbamate pesticide, solid, toxic (Carbofuran 10 %)
Hazard ID no.	66
Label:	6.1
IMDG/IMO	
Packaging group:	II
Label of class:	6.1 Marine pollutant
Shipping name:	Carbamate pesticide, solid, toxic (Carbofuran 10 %)
AIR/ IATA	
Shipping name	Carbamate pesticide, solid, toxic, (Carbofuran 10 %)
Class	6.1
Hazard label	Toxic
Packaging Group	II
Passenger Aircraft	613 (max 25 kg) Y613 (max 1 kg)
Cargo Aircraft	615 (max 100 kg)
UK classification:	Not available
Tremcard number	61GT7-III

15. REGULATORY INFORMATION

Symbol: T+,N

Indication of danger: Very toxic, Dangerous for the Environment.

Risk phrases:

R 26/28 Very toxic by inhalation and if swallowed.

R50/53 Very toxic to aquatic organisms, may cause long-term effects in the aquatic environment

Safety phrases:

S 1/2 Keep locked up and out of reach of children.

S 36/37 Wear suitable protective clothing and gloves.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

16. OTHER INFORMATION

AGFURAN 10 G is the property of FarmAg International (Pty) Ltd.

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.*