

MATERIAL SAFETY DATA SHEET



Emergency Phone: 1800-033-882 (24 hrs)
Dow AgroSciences Australia Ltd.
Frenchs Forest NSW 2086

RELDAN* GRAIN PROTECTOR

Effective Date: 25 September 2006
Product Code: 15809

1. PRODUCT AND COMPANY IDENTIFICATION:

PRODUCT: Reldan* Grain Protector

PURPOSE: Grain protectant insecticide

COMPANY IDENTIFICATION:

Dow AgroSciences Australia Ltd.
ABN 24 003 771 659
Level 5, 20 Rodborough Road,
Frenchs Forest NSW 2086

Customer Service Toll Free Number:

1800 700 096
(Mon-Fri, 8am–5pm EST)

Emergency Telephone Number:

1800 033 882
(24 hours) (EMERGENCIES ONLY)

Transport Emergency Only Dial 000

2. HAZARDOUS IDENTIFICATIONS:

EMERGENCY OVERVIEW

Classified as hazardous according to the criteria of NOHSC

Not Classified as Dangerous Goods for Land Transport

Potential Health Effects:

Irritating to eyes, skin and respiratory system.

RISK PHRASES:

R36/37/38: Irritating to eyes, respiratory system and skin.

R43: May cause sensitisation by skin contact.

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

SAFETY PHRASES:

S2: Keep out of the reach of children.

S62: If swallowed, do not induce vomiting: seek medical advice immediately and show the label.

S60: This material and its container must be disposed of as hazardous waste.
S61: Avoid release to the environment. Refer to special instructions (see sections 6, 7, 13)

3. COMPOSITION/INFORMATION ON INGREDIENTS:

Ingredient	CAS #	Content
Chlorpyrifos-methyl	005598-13-0	44.3%
Aromatic hydrocarbon solvent	064742-94-5	45.1%
Balance not contributing to hazard		10.6%

4. FIRST AID:

Consult the Poisons Information Centre (Australia 131126) or a doctor in every case of suspected chemical poisoning. Never give fluids or induce vomiting if a patient is unconscious or convulsing regardless of cause of injury. If breathing difficulties occur seek medical attention immediately.

EYE: Hold eyes open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes then continue rinsing eyes. Call the Poison Information Centre or doctor for treatment advice.

SKIN: Wash off in flowing water or shower.

INGESTION: Immediately call the Poison Information Centre or doctor. Do not induce vomiting unless told to do so by the Poison Information Centre or doctor. Do not give any liquid to the person. Do not give anything by mouth to an unconscious person.

INHALATION: Move person to fresh air. If person is not breathing, call 000 or ambulance, and then give artificial respiration; if by mouth to mouth use rescuer protection (pocket mask, etc.) Call the Poison Information Centre or doctor for treatment advice. If breathing is difficult, oxygen should be administered by qualified personnel.

NOTE TO PHYSICIAN: If lavage is performed, suggest endotracheal and/or oesophageal control. Danger from lung aspiration must be weighed against toxicity when considering emptying the stomach. The decision of whether to induce vomiting or not should be made by an

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attending physician. Atropine, only by injection, is the preferable antidote. Oximes, such as 2-PAM/protopam, may be therapeutic if used early; however, use only in conjunction with atropine. If exposed, plasma and red blood cell cholinesterase tests may indicate significance of exposure (baseline data are useful). In case of severe acute poisoning, use antidote immediately after establishing an open airway and respiration. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient. Chlorpyrifos-methyl is a cholinesterase inhibitor.

Small spills/leaks: Absorb with material such as sand, soil or sawdust. Collect spilled product and place in sealable container for disposal. Spill residues may be cleaned using a bleach (sodium hypochlorite) solution mixed according to bleach label recommendations for normal cleaning purposes. Contain and absorb wash water for disposal. Absorb and collect washings and place in the same sealable container for disposal. **Large spills/leaks:** Dike the area of large spills and report them to Dow AgroSciences at 1800-033-882. Do not use water to clean up.

5. FIRE FIGHTING MEASURES:

FLASH POINT: 64°C (PMCC)

COMBUSTIBLE: C1

FLAMMABLE LIMITS

LFL: 0.9%

UFL: 6.0%

EXTINGUISHING MEDIA: Foam, alcohol foam, CO₂ and dry chemical. Foam system is preferred because uncontrolled water can spread possible contamination.

FIRE AND EXPLOSION HAZARDS: Toxic, irritating gases may be formed. Rapid decomposition above 160-200°C. Violent rupture of containers due to over-pressurization may occur. Avoid heating above 50°C. Chlorpyrifos-methyl undergoes exothermic decomposition which can lead to higher temperatures and violent decomposition if heat developed is not removed. Contains a solvent that will burn, keep vapours away from ignition sources. In fire may produce hydrogen chloride, nitrogen oxides and phosphorus oxides.

FIRE-FIGHTING EQUIPMENT: Use positive-pressure, self-contained breathing apparatus and full protective clothing.

HAZCHEM: 2X

6. ACCIDENTAL RELEASE MEASURES:

ACTION TO TAKE FOR SPILLS/LEAKS: DO NOT touch or walk through spilled material. Wear a face shield or goggles, overalls buttoned to neck and wrist, chemical resistant gloves and boots. Stop leak when safe to do so. Dike area and prevent entry into waterways, and drains.

7. HANDLING AND STORAGE:

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE:

HANDLING: Keep out of reach of children. Harmful if swallowed, inhaled, or absorbed through skin. Causes eye and skin irritation. Avoid contact with eyes, skin and clothing. Users should wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet.

STORAGE: Store in tightly closed original container in a cool, dry well-ventilated area out of direct sunlight when not in use. Do not store with food, feedstuffs, fertilizers and seeds. See product label for further handling/storage precautions relative to the end use of this product. Reduce stacking height where local conditions can affect packaging strength.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION:

These precautions are suggested for conditions where the potential for exposure exists. Emergency conditions may require additional precautions

EXPOSURE GUIDELINES:

Chlorpyrifos-methyl: Dow AgroSciences Industrial Hygiene Guide is 0.1 mg/m³, Skin.

Solvent: May contain xylene. ACGIH TLV and OSHA PEL for xylene are 100 ppm TWA, 150 ppm STEL.

A 'skin' notation following the exposure guideline refers to the potential for dermal absorption of the material including mucous membranes and the eyes either by contact with vapours or by direct skin contact. It is intended to alert the reader that inhalation may not be the only route of

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exposure and that measures to minimize dermal exposures should be considered.

ENGINEERING CONTROLS: Provide general and/or local exhaust ventilation to control airborne levels below the exposure guidelines.

RECOMMENDATIONS FOR MANUFACTURING, COMMERCIAL BLENDING, AND PACKAGING WORKERS:

EYE/FACE PROTECTION: Use chemical goggles. If vapour exposure causes discomfort, use an approved full-face respirator.

SKIN PROTECTION: Use gloves chemically resistant to this material (e.g. PVC or nitrile) when prolonged or frequently repeated contact could occur.

RESPIRATORY PROTECTION: For emergency response or for situations where the atmospheric level is unknown, use an approved positive-pressure self-contained breathing apparatus. Selection of air-purifying or positive-pressure supplied-air will depend on the specific operation and the potential airborne concentration of the material.

APPLICATORS AND ALL OTHER HANDLERS: Refer to the product label for personal protective clothing and equipment.

9. PHYSICAL AND CHEMICAL PROPERTIES:

BOILING POINT: 179°C (solvent)
VAPOUR PRESSURE: 4.2×10^{-7} mmHg @ 25°C (chlorpyrifos-methyl); <10 mmHg @20°C (solvent)
DENSITY: 1.120 g/mL @ 20°C
SOLUBILITY IN WATER: Emulsifiable
SPECIFIC GRAVITY: 1.12 g/mL @ 20°C
APPEARANCE: Yellow liquid
ODOUR: Aromatic
pH: 4-6.5 (1% solution)

10. STABILITY AND REACTIVITY:

STABILITY: Stable under normal storage conditions. Avoid heating above 50°C.

INCOMPATIBILITY: (specific materials to avoid) Oxidizers, strong acids and strong alkalis.

HAZARDOUS DECOMPOSITION PRODUCTS: Hydrogen chloride, methyl-sulfide, dimethyl sulfides, and nitrogen and phosphorous oxides.

HAZARDOUS POLYMERIZATION: Not known to occur.

11. TOXICOLOGICAL INFORMATION:

POTENTIAL HEALTH EFFECTS: This section includes possible adverse effects, which could occur if this material is not handled in the recommended manner.

EYE: May cause severe eye irritation. May cause severe corneal injury. Vapour may cause eye irritation experienced as mild discomfort and redness. Cataracts and other eye effects have been reported in humans repeatedly exposed to the solvent vapour or dust.

SKIN: Brief contact may cause skin irritation with local redness. Has caused allergic skin reactions when tested in guinea pigs. The LD₅₀ for skin absorption in rabbits is >5000 mg/kg.

INGESTION: Low toxicity if swallowed. Small amounts swallowed incidentally as a result of normal handling operations are not likely to cause injury; however, swallowing larger amounts may cause injury. Aspiration into the lungs may occur during ingestion or vomiting, causing lung damage or even death due to chemical pneumonia. The oral LD₅₀ for rats is between >2000 mg/kg (males) and >3000 mg/kg (females).

INHALATION: The LC₅₀ for rats is >6.654 mg/L for 4 hours. Prolonged excessive exposure may cause adverse effects. Excessive exposure may cause irritation to the upper respiratory tract (nose and throat). May cause central nervous system effects.

SYSTEMIC (OTHER TARGET ORGAN) EFFECTS: Excessive exposure may product organophosphate type cholinesterase inhibition. Signs and symptoms of excessive exposure to chlorpyrifos-methyl may be headache, dizziness, incoordination, muscle twitching, tremors, nausea, abdominal cramps, diarrhea, sweating, pinpoint pupils, blurred vision, salivation, tearing, tightness in chest, excessive urination, and convulsions. In animals, effects have been reported on the following organs: adrenal gland and liver. Excessive exposure to the solvent may cause

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respiratory irritation and central nervous system depression.

CANCER INFORMATION: Chlorpyrifos-methyl did not cause cancer in animal studies.

TERATOLOGY (BIRTH DEFECTS): High doses of chlorpyrifos-methyl fed to pregnant mice resulted in an increase in cleft palate, a common developmental abnormality in mice. No abnormalities have been observed in other species under similar test conditions. The solvent did not cause birth defects or any other foetal effects in laboratory animals.

REPRODUCTIVE EFFECTS: In animal studies, chlorpyrifos-methyl did not interfere with reproduction.

MUTAGENICITY: In-vitro and animal genetic toxicity studies were negative for the components tested.

12. ECOLOGICAL INFORMATION:

ENVIRONMENTAL DATA:

MOVEMENT & PARTITIONING:

Based largely or completely on information for chlorpyrifos-methyl.

Bioconcentration potential is moderate (BCF is between 100 and 3000 or Log Pow between 3 and 5). Potential for mobility in soil is slight (Koc is between 2000 and 5000).

DEGRADATION & PERSISTENCE:

Based largely or completely on information for chlorpyrifos-methyl.

Biodegradation under aerobic laboratory conditions is below detectable limits (BOD20 or BOD28/ThOD is <2.5%).

Based on stringent OECD test guidelines, this material cannot be considered as readily biodegradable; however, these results do not necessarily mean that the material is not biodegradable under environmental conditions.

ECOTOXICOLOGY:

Based largely or completely on information for chlorpyrifos-methyl.

Material is very highly toxic to aquatic organisms on an acute basis (LC₅₀ or EC₅₀ <0.1 mg/L in most sensitive species tested).

Material is slightly toxic to aquatic organisms on an acute basis (LC₅₀ or EC₅₀ is between 10 and 100 mg/L in the most sensitive species tested).

13. DISPOSAL CONSIDERATIONS:

DISPOSAL METHOD: If wastes and/or containers cannot be disposed of according to the product label directions, disposal of this material must be in accordance with your local or area regulations. This information presented below only applies to the material as supplied. The identification based on characteristic(s) or listing may not apply if the material has been used or otherwise contaminated. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste identification and disposal methods in compliance with applicable regulations. If the material as supplied becomes a waste, follow all applicable regional, national and local laws and regulations.

14. TRANSPORT INFORMATION:

ROAD AND RAIL TRANSPORT: Not classified as Dangerous Goods for transport by road and rail according to the criteria of ADG 6.

SEA AND AIR TRANSPORT: Classified as Dangerous Goods for transport by sea and air according to the criteria of the UN Model Regulations for Transport of Dangerous goods 13th Edition.

UN No: 3082

Class: 9

Packing group: III

SHIPPING NAME: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (chlorpyrifos-methyl)

15. REGULATORY INFORMATION:

APVMA APPROVAL NUMBER: 56177

POISON SCHEDULE: S6

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16. OTHER INFORMATION:

Glossary

ACGIH: American Conference of Governmental Industrial Hygienists.

AIHA WEEL: American Industrial Hygiene Association's Workplace Environmental Exposure Level.

BCF: Bioconcentration Factor - a measure for the characterization of the accumulation of a chemical in an organism. It is defined as the concentration of a chemical in an organism (plants, microorganisms, animals) divided by the concentration in a reference compartment (e.g. food, surrounding water).

Dow AgroSciences Industrial Hygiene Guideline: An internal company standard based on an 8 hour TWA.

EC₅₀: median effective concentration. Statistically derived concentration of a substance in an environmental medium expected to produce a certain effect in 50% of test organisms in a given population under a defined set of conditions.

Explosive Limits - The range of concentrations (% by volume in air) of a flammable gas or vapour that can result in an explosion for ignition in a confined space.

K_{oc} - the organic carbon partition coefficient (mL soil water /g organic carbon).

LC₅₀ - Lethal Concentration 50%. A concentration of chemical in air or water that will kill 50% of the test organisms.

LD₅₀ - Lethal Dose-50%. The dose of a chemical that will kill 50% of the test animals receiving it.

NOHSC: National Occupational Health and Safety Commission of Australia now the Office of the Australian Safety and Compensation Council.

OSHA: American Occupational Safety and Health Administration.

PEL: Permissible Exposure Level, a maximum allowable exposure level by law.

pH - Measure of how acidic or alkaline a material is using a 1 - 14 scale. pH 1 is strongly acidic and pH 14 strongly alkaline.

Polymerisation - a chemical reaction in which small molecules (monomers) combine to form much larger molecules (polymers). A hazardous polymerisation reaction is one that occurs at a fast rate and releases large amounts of energy.

P_{ow} - The octanol-water partition coefficient is the ratio of the concentration of a chemical in octanol and in water at equilibrium and at a specified temperature. Octanol is an organic solvent that is used as a surrogate for natural organic matter. This parameter is used in many

environmental studies to help determine the fate of chemicals in the environment.

STEL: Short-Term Exposure Limit. A term used to indicate the maximum average concentration allowed for a continuous 15 minute exposure period.

TLV: Threshold Limit Value, an exposure limit set by a competent authority

TWA - Time Weighted Average. The average concentration of a chemical in air over the total exposure time - usually an 8 hour work day.

References

AS/NZS 1715-1994 Selection Use and Maintenance of Respiratory Protective Devices.

ASNZS 1716 - 1994 Respiratory protective devices. Australian Dangerous Goods Code

NOHSC Hazardous Substances Information System.

FOR FURTHER PRODUCT INFORMATION CALL DOW AGROSCIENCES CUSTOMER SERVICE REPRESENTATIVES TOLL FREE 1800 700 096 DURING BUSINESS HOURS.

This MSDS has been compiled using publicly available information, information provided by suppliers of ingredients used in the product and internal studies on the product and/or its ingredients.

THIS MSDS SUMMARISES OUR BEST KNOWLEDGE OF THE HEALTH AND SAFETY HAZARD INFORMATION OF THE PRODUCT AND HOW TO SAFELY HANDLE AND USE THE PRODUCT IN THE WORKPLACE BASED ON PUBLICLY AVAILABLE AND INTERNALLY AVAILABLE INFORMATION. EACH USER SHOULD READ THIS MSDS AND CONSIDER THE INFORMATION IN THE CONTEXT OF HOW THE PRODUCT WILL BE HANDLED AND USED IN THE WORKPLACE INCLUDING IN CONJUNCTION WITH OTHER PRODUCTS. IF CLARIFICATION OR FURTHER INFORMATION IS NEEDED TO ENSURE THAT AN APPROPRIATE RISK ASSESSMENT CAN BE MADE, THE USER SHOULD CONTACT THIS COMPANY. THE RESPONSIBILITY FOR PRODUCTS SOLD IS SUBJECT TO OUR STANDARD TERMS AND CONDITIONS, A COPY OF WHICH IS SENT TO OUR CUSTOMERS AND IS ALSO AVAILABLE ON REQUEST.

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