

MATERIAL SAFETY DATA SHEET



Emergency Phone: 1800-033-882 (24 hrs)
Dow AgroSciences Australia Ltd.
Frenchs Forest NSW 2086
18 April 2008
Product Code: 110642

PRODUCT: CRUSADER* HERBICIDE

PRODUCT AND COMPANY IDENTIFICATION:

PRODUCT: Crusader* Herbicide

PURPOSE: Herbicide

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 (see Section 14)

Potential Health Effects:

Harmful if inhaled. May irritate nose and throat. Will irritate the skin. Will damage the eyes. Repeated exposure may cause allergic disorders.

RISK PHRASES:

R20: Harmful by inhalation.

R38: Irritating to skin.

R41: Risk of serious damage to eyes.

R43: May cause sensitization by skin contact.

R50: Very toxic to aquatic organisms.

SAFETY PHRASES:

S24/25: Avoid contact with skin and eyes.

S28: After contact with skin, wash immediately with plenty of soap and water.

S61: Avoid release to the environment. Refer to special instructions below in sections 6, 7 and 13.

3. COMPOSITION/INFORMATION ON INGREDIENTS:

COMPONENT	CAS NUMBER	W/W%
Pyroxsulam	422556-08-9	2.9
Cloquintocet-mexyl	99607-70-2	9.0
Low boiling point petroleum distillate	68477-31-6	>60
Balance not individually contributing to hazard		<20

4. FIRST AID:

Consult the Poisons Information Centre (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: Immediately flush eyes with water; remove contact lenses, if present, after the first 5 minutes, and then continue flushing eyes for at least 15 minutes. Obtain medical attention without delay, preferably from an ophthalmologist.

SKIN: Remove material from skin immediately by washing with soap and plenty of water. Remove contaminated clothing and shoes while washing. Seek medical attention if irritation persists. Wash clothing before reuse. Discard items which cannot be decontaminated, including leather articles such as shoes, belts and watchbands.

INGESTION: If swallowed, seek medical attention. Do NOT induce vomiting unless directed to do so by medical personnel. Give a glass of water.

INHALATION: Move person to fresh air. If not breathing, give artificial respiration; if by mouth to mouth use rescuer protection (pocket mask etc). If breathing is difficult, oxygen should be administered by qualified personnel. Call a physician or transport to a medical facility.

NOTE TO PHYSICIAN: Maintain adequate ventilation and oxygenation of the patient. May cause asthma-like (reactive airways) symptoms. Bronchodilator expectorants and antitussives may be of help. No specific antidote.

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Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient.

5. FIRE FIGHTING MEASURES:

FLASH POINT: 96°C
METHOD USED: CC

FLAMMABLE LIMITS

LFL: 0.6% v/v (solvent)
UFL: 7% v/v (solvent)

EXTINGUISHING MEDIA: Foam, CO₂, or Dry chemical

FIRE AND EXPLOSION HAZARDS: Foam fire extinguishing system is preferred because uncontrolled water can spread possible contamination. Toxic irritating gases may be formed under fire conditions.

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

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. Wear protective clothing and self contained breathing apparatus if vapours are present. Stop leak when safe to do so. Dike area and prevent entry into waterways, and drains. **Small spills/leaks:** Absorb with material such as sand, soil or sawdust. Collect spilled product and place in sealable container for disposal. The spill residue area may be cleaned using water and detergent. Contain and absorb wash water for disposal. Absorb and collect washings and place in the same sealable container for disposal. Dike the area of large spills and report them to Dow AgroSciences at 1800-033-882.

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 skin irritation and severe eye irritation. May cause an allergic skin reaction in some people. Avoid contact with eyes,

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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 a potential for exposure exists. Emergency conditions may require additional precautions.

EXPOSURE GUIDELINES:

Pyroxsulam: Dow AgroSciences Industrial Hygiene Guide is 5 mg/m³, D-SEN

Cloquintocet-mexyl: 10 mg/m³ TWA recommended by manufacturer.

Solvent: 100 mg/m³ TWA recommended by manufacturer.

ENGINEERING CONTROLS: Use local exhaust ventilation, or other engineering controls to maintain airborne levels below exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, general ventilation should be sufficient for most operations. Local exhaust ventilation may be necessary for some operations.

RECOMMENDATIONS FOR MANUFACTURING, COMMERCIAL BLENDING, AND PACKAGING WORKERS:

EYE/FACE PROTECTION: Use chemical goggles.

SKIN PROTECTION: Use protective clothing chemically resistant to this material. Selection of specific items such as face shield, boots, apron, or full body suit will depend on the task. Remove contaminated clothing immediately, wash skin area with soap and water, and launder clothing before reuse or dispose of properly. Items which cannot be decontaminated, such as shoes, belts and watchbands, should be removed and disposed of properly.

HAND PROTECTION: Use gloves chemically resistant to this material. Examples of preferred glove barrier materials include: Polyethylene, Ethyl vinyl alcohol laminate (EVAL),

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Polyvinyl alcohol (PVA), Viton, Polyvinyl chloride (PVC or vinyl), Styrene/butadiene rubber. Examples of acceptable glove barrier materials include: Chlorinated polyethylene, Neoprene, Nitrile/butadiene rubber (Nitrile or NBR), Butyl rubber, natural rubber (latex). NOTICE: The selection of a specific glove for a particular application and duration of use in a workplace should also take into account all relevant workplace factors such as, but not limited to: other chemicals which may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), potential body reactions to glove materials, as well as the instructions/specifications provided by the glove supplier.

RESPIRATORY PROTECTION: Respiratory protection should be worn when there is a potential to exceed the exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, wear respiratory protection when adverse effects, such as respiratory irritation or discomfort have been experienced, or where indicated by your risk assessment process. For most conditions no respiratory protection should be needed; however, if discomfort is experienced, use an approved air-purifying respirator. The following should be effective types of air-purifying respirators: organic vapour cartridge with a particulate pre-filter.

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

9. PHYSICAL AND CHEMICAL PROPERTIES:

APPEARANCE: Brown liquid

ODOUR: Mild

LIQUID DENSITY: 1.04 g/cm³ @ 20°C

pH: 6.2

VAPOUR PRESSURE: $< 1 \times 10^{-7}$ Pa @ 20°C (pyroxsulam) ; 0.00531 mPa @ 25°C.

10. STABILITY AND REACTIVITY:

STABILITY: (CONDITIONS TO AVOID) Stable under normal storage conditions.

INCOMPATIBILITY: (SPECIFIC MATERIALS TO AVOID) None known.

HAZARDOUS DECOMPOSITION PRODUCTS: May produce asphyxiating and irritating gases including hydrogen fluoride and oxides of carbon, nitrogen and sulphur.

HAZARDOUS POLYMERIZATION: Not expected 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: Causes severe eye irritation that may be slow to heal. May cause slight corneal injury.

SKIN: Brief contact may cause moderate skin irritation with local redness. Has caused allergic skin reactions when tested in mice. Prolonged skin contact is unlikely to result in absorption of harmful amounts. The LD₅₀ for skin absorption in rats is >2,000 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. The oral LD₅₀ for rats is >2,000 mg/kg.

INHALATION: Tests on laboratory animals for a similar product showed no toxic effects at the maximum attainable air concentration. (4 hour inhalation LC₅₀ > 1.1 mg/L). Excessive exposure to the solvent may cause irritation to upper respiratory tract (nose and throat) and lungs. May cause central nervous system effects. Symptoms of excessive exposure may include headaches and dizziness. The inhalation LC₅₀ is > 5,000 mg/m³.

SYSTEMIC (OTHER TARGET ORGAN) EFFECTS: For the active ingredient(s): in animals, effects have been reported on the liver. Based on information for component(s): in animals, effects have been reported on the following organs: liver, kidney, lung, bladder, bone marrow, thymus, gastrointestinal tract, thyroid, urinary tract,

CANCER INFORMATION: Product is not classified as a carcinogen. The active ingredients did not cause cancer in laboratory animals.

TERATOLOGY (BIRTH DEFECTS): The active ingredients did not cause birth defects or any other fetal effects in laboratory animals. No information found for the solvent.

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REPRODUCTIVE EFFECTS: For the active ingredients did not interfere with reproduction in animal studies. No information found for the solvent.

MUTAGENICITY: In-vitro and animal genetic toxicity studies for the active ingredients were negative. No information found for the solvent.

12. ECOLOGICAL INFORMATION:

ENVIRONMENTAL DATA:

MOVEMENT AND PARTITIONING:

Based largely or completely on information for the cloquintocet-mexyl.

Bioconcentration potential is moderate (BCF is between 100 and 3000).

Henry's Law Constant (H): $2.98E-08 \text{ atm} \cdot \text{m}^3/\text{mole}$; 25C

Partition coefficient, n-octanol/water (log Pow): 5.03

Partition coefficient, soil organic carbon water (Koc): 38,070

Bioconcentration Factor (BCF): 1,490

Based largely or completely on information for the pyroxsulam.

Bioconcentration potential is low (Log Pow is < 3).

Henry's Law Constant (H): $2.98E-08 \text{ atm} \cdot \text{m}^3/\text{mole}$; 25C

Partition coefficient, n-octanol/water (log Pow): 1.01 @ pH7 & 20°C

Partition coefficient, soil organic carbon water (Koc): 30 (2-129) L/kg

DEGRADATION & PERSISTENCE:

Based largely or completely on information for the pyroxsulam.

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 the active ingredients.

Material is highly toxic to aquatic organisms on an acute basis (LC_{50} or EC_{50} is between 0.1 and 1 mg/L in the most sensitive species tested).

Material is practically non toxic to birds on an acute basis (LD_{50} is >2,000 mg/kg).

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 regulatory authorities. 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, RAIL TRANSPORT: Not classified as dangerous goods according to the criteria of the Australian Dangerous Goods Code (ADG 7) when transported in packagings, IBCs or other receptacles not exceeding 500L.

SEA AND AIR TRANSPORT: Classified as dangerous goods for transport by sea and air in accordance with the International Maritime Dangerous Goods Code (IMDG) and the International Air Transport Association (IATA) Dangerous Goods Regulation.

UN No: 3082

Class: 9

Packing group: III

SHIPPING NAME: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (contains pyroxsulam, cloquintocet-mexyl and alkyl C3-C6 benzenes). Marine Pollutant

15. REGULATORY INFORMATION:

APVMA APPROVAL NUMBER: 61277

POISON SCHEDULE: 6

16. OTHER INFORMATION:

Glossary

ACGIH: American Conference of Governmental Industrial Hygienists.

ASCC: Australian Safety and Compensation Council.

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

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an organism (plants, microorganisms, animals) divided by the concentration in a reference compartment (e.g. food, surrounding water).

BOD: Biochemical oxygen demand. The amount of oxygen required by aerobic microorganisms to decompose the organic matter in a sample of water, such as that polluted by sewage. It is used as a measure of the degree of water pollution. Also called biological oxygen demand.

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).

K_{ow}: See P_{ow}

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 doses of a chemical that will kill 50% of the test animals receiving it.

NIOSH: American national Institute of Occupational Safety and Health, a federal agency which conducts research on occupational safety and health questions and recommends new standards.

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

OASCC: Office of the Australian Safety & Compensation Commission.

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 workday.

References

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

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

AS/NZS 2161.10 - 2005 Occupational protective gloves - Part 10.1: Protective gloves against chemicals and micro-organisms.

International Maritime Dangerous Goods Code.

International Air Transport Association (IATA) Dangerous Goods Regulation

NOHSC Hazardous Substances Information System.

VERSION TRACKING

Replaces version dated: New

Sections amended: All

Product code: GF-1674

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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