

# MATERIAL SAFETY DATA SHEET



Date of Issue: June 3<sup>rd</sup>, 2009

## 1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

Product name **Jaguar® Selective Herbicide**  
Other names None  
Product codes and pack sizes 4207938 (20 L), 79013396 (110 L), 79384440 (1000 L)  
Chemical group Hydroxybenzotrile + nicotinanilide  
Recommended use Agricultural herbicide  
Formulation Emulsifiable concentrate  
Supplier Bayer CropScience Pty Ltd ABN 87 000 226 022  
Address 391 - 393 Tooronga Road, East Hawthorn, Victoria 3123, Australia  
Telephone (03) 9248 6888  
Facsimile (03) 9248 6800  
Website [www.bayercropscience.com.au](http://www.bayercropscience.com.au)  
Contact Development Manager (03) 9248 6888  
Emergency Telephone Number 1800 033 111 – Orica SH&E Shared Services

## 2. HAZARDS IDENTIFICATION

### EMERGENCY OVERVIEW

HAZARDOUS SUBSTANCE (see Risk phrases below) – NON DANGEROUS GOOD  
Combustible liquid. Dangerous to the aquatic environment.

Hazard classification Hazardous (National Occupational Health and Safety Commission - NOHSC)  
Risk phrases R22 – Harmful if swallowed  
R23 – Toxic by inhalation  
R36/38 – Irritating to eyes and skin  
R43 – May cause sensitization by skin contact  
R63 – Possible risk of harm to the unborn child  
Safety phrases See Sections 4, 5, 6, 7, 8, 10, 12, 13  
ADG classification See Section 14.  
SUSDP classification Schedule 6 (Standard for the Uniform Scheduling of Drugs and Poisons)  
(Poison Schedule)

## 3. COMPOSITION / INFORMATION ON INGREDIENTS

| Ingredients            | CAS Number      | Concentration (g/L)        |
|------------------------|-----------------|----------------------------|
| Bromoxynil octanoate   | [1689-99-2]     | 364 (≡ 250 g/L bromoxynil) |
| Diflufenican           | [83164-33-4]    | 25                         |
| N-Methyl-2-pyrrolidone | [872-50-4]      | 150                        |
| Hydrocarbon solvent    | [90438-79-2]    | 416                        |
| Other ingredients      | (non hazardous) | 123                        |

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## 4. FIRST AID MEASURES

If poisoning occurs, immediately contact a doctor or Poisons Information Centre (telephone 13 11 26), and follow the advice given. Show this Material Safety Data Sheet to the doctor.

|                      |   |
|----------------------|---|
| Inhalation           | If inhaled, remove to fresh air and keep at rest. Obtain medical advice if symptoms persist. If breathing stops or shows signs of failing, start artificial respiration. Call for prompt medical attention.   |
| Skin contact         | Carefully remove contaminated clothing. Wash affected areas with soap and water. Seek medical aid if symptoms persist.  |
| Eye contact          | Rinse eyes immediately with plenty of clean water and obtain medical aid.   |
| Ingestion            | Wash out mouth with water. Do NOT induce vomiting. Give a glass of water. Keep patient at rest and seek medical advice immediately.<br>DO NOT attempt to give anything by mouth to a semi-conscious or unconscious person.  |
| First Aid Facilities | Provide eyewash and safety shower facilities in the workplace.  |
| Medical attention    | <u>Symptoms</u><br><i>Local:</i> Skin sensitisation, local irritation.<br><i>Systemic:</i> fatigue, thirst, high temperature, anxiety, hyperventilation, tachycardia, muscle rigidity typical of malignant hyperthermia, nausea, vomiting, sweating, salivation, convulsions.<br><br><u>Note for physicians</u><br>This product contains a hydrocarbon solvent. Care should be taken to prevent pulmonary aspiration. Small amounts of liquid aspirated into the respiratory system during ingestion or from vomiting may cause bronchopneumonia or pulmonary oedema.<br><br>Monitor respiratory and cardiac functions and body temperature. Keep airway clear, administer artificial respiration if necessary. Gastric lavage should be considered in cases of significant ingestions within the first 2 hours. The application of sodium sulphate is always advisable.<br>In case of hyperthermia, physical cooling is advisable. In case of muscle rigidity, muscle relaxants and mechanical ventilation may support in counteracting hyperthermia.<br>There is no specific antidote.<br>Contraindications: antipyretics |

## 5. FIRE FIGHTING MEASURES

|                                  |   |
|----------------------------------|---|
| Extinguishing media              | Foam, dry agent, carbon dioxide, water spray  |
| Hazards from combustion products | Hydrogen bromide, hydrogen cyanide, hydrogen fluoride, and oxides of nitrogen and carbon may be released in a fire. |

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## 5. FIRE FIGHTING MEASURES - continued

**Precautions for fire fighters** Combustible liquid. N-methyl-2-pyrrolidone vapours are heavier than air. Fire fighters should wear full protective gear, including self-contained breathing apparatus (AS/NZS 1715/1716). Toxic decomposition products may be produced in a fire. If possible and without risk, remove intact containers from exposure to fire. Otherwise, spray unopened containers with water to keep cool. Avoid spraying directly into containers. Keep unnecessary people away. Bund area to prevent contamination of water sources. Dispose of fire control water and spillage safely later.

**Hazchem code** Not applicable

## 6. ACCIDENTAL RELEASE MEASURES

Avoid contact with spilled material or contaminated surfaces. Extinguish or remove possible sources of ignition. When dealing with spills do not eat, drink or smoke and wear protective clothing and equipment as described in Section 8 - PERSONAL PROTECTION. Keep people and animals away and upwind. Prevent spilled material from entering drains or watercourses. Contain spill and absorb with earth, sand, clay, or other absorbent material. Collect and store in properly labelled, sealed drums for safe disposal. Deal with all spillages immediately. If contamination of drains, streams, watercourses, etc. is unavoidable, warn the local water authority.

## 7. HANDLING AND STORAGE

**Handling** Keep out of reach of children. Product is harmful if inhaled or swallowed. Will irritate eyes, nose, throat and skin. Avoid inhaling spray mist. When preparing spray wear elbow length PVC gloves and face-shield. If product in eyes, wash it out immediately with water. After handling and before eating, drinking or smoking, wash hands, arms and face thoroughly with soap and water. After each day's use wash gloves, face shield and contaminated clothing. Keep away from all ignition sources.

**Storage** Store in the closed, original container in a cool, well-ventilated area. Do not store for prolonged periods in direct sunlight.

**Flammability** Combustible liquid, Class C1 – flashpoint between 61° C and 150° C.

## 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

**Exposure standards** The NOHSC exposure standards for N-methyl-2-pyrrolidone are:  
TWA 25 ppm(103 mg/m<sup>3</sup>); STEL 75 ppm (309 mg/m<sup>3</sup>); Skin notation

*Exposure standard – Time Weighted Average (TWA)* means the average airborne concentration of a particular substance when calculated over a normal eight-hour working day, for a five-day working week.

*Exposure standard – Short Term Exposure limit (STEL)* means a 15 minute TWA exposure which should not be exceeded at any time during a working day even if the eight-hour TWA average is within the TWA exposure standard. Exposures at the STEL should not be longer than 15 minutes and should not be repeated more than four times per day. There should be at least 60 minutes between successive exposures at the STEL.

*Skin notation* – Absorption through the skin may be a significant source of exposure.

**Biological limit values** None allocated

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## 8. EXPOSURE CONTROLS / PERSONAL PROTECTION – continued

- Engineering controls    Control process conditions to avoid contact. Use local exhaust ventilation during manufacturing operations. Use in a well-ventilated area only.
- Personal Protective Equipment
- Face-shield
  - Cotton overalls buttoned to the neck and wrist and a washable hat
  - Elbow-length PVC gloves
  - If inhalation exposure is likely to exceed the exposure standards above, an AS/NZS 1715/1716 approved respirator suitable for organic vapours should be worn.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

- Appearance:            Clear yellow to dark brown liquid
- Odour:                    Distinctive strong ester odour
- pH:                        Not available
- Vapour pressure:        <  $1 \times 10^{-4}$  mPa (bromoxynil octanoate) at 40 °C  
4.25 x  $10^{-3}$  mPa (diflufenican) at 25 °C
- Vapour density:        Not available
- Boiling point:            Not available
- Freezing/melting point:        Not available
- Solubility:                Emulsifies in water
- Density:                  1.078 g/mL at 20 °C
- Flash Point:             66 °C
- Flammability (explosive) limits:    Not available
- Auto-ignition temperature:        Not available
- Partition coefficient (octanol/water):
- Bromoxynil octanoate*: Log  $P_{ow}$  = 5.9 (pH 7)
  - Diflufenican*: Log  $P_{ow}$  = 4.9
  - N-methyl-2-pyrrolidone*: Log  $P_{ow}$  = - 0.46

## 10. STABILITY AND REACTIVITY

- Chemical stability        Stable under normal conditions of use.
- Conditions to avoid     Avoid sources of ignition and extremes of temperature.
- Incompatible materials    Incompatible with strong acids and bases, oxidizing agents. The rubber components present in some spraying units may be affected by exposure to the solvents in Jaguar.
- Hazardous decomposition products    Hydrogen bromide, hydrogen cyanide, hydrogen fluoride, and oxides of carbon and nitrogen may be released in a fire.
- Hazardous reactions     None

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## 11. TOXICOLOGICAL INFORMATION

### POTENTIAL HEALTH EFFECTS

|              |   |
|--------------|---|
| Inhalation   | Harmful if inhaled.                                 |
| Skin contact | Will irritate the skin and may cause sensitisation. |
| Eye contact  | Will irritate the eyes.                             |
| Ingestion    | Harmful if swallowed.                               |

### ANIMAL TOXICITY DATA – SIMILAR PRODUCT

#### Acute:

|                     |   |
|---------------------|---|
| Oral toxicity       | LD <sub>50</sub> rat: 1113 mg/kg  |
| Dermal toxicity     | LD <sub>50</sub> rat: > 2000 mg/kg  |
| Inhalation toxicity | Inhalation LC <sub>50</sub> rat: 0.72 - 0.81 mg/L (4 h) ( <i>bromoxynil octanoate</i> )<br>Inhalation LC <sub>50</sub> rat: > 5.12 mg/L (4 h) ( <i>diflufenican</i> ) |
| Skin irritation     | Non irritating (rabbit)   |
| Eye irritation      | Irritating (rabbit)   |
| Sensitisation       | Slightly sensitising (guinea pig) ( <i>bromoxynil octanoate</i> )<br>Not sensitising (guinea pig) ( <i>diflufenican</i> )   |

#### Chronic:

Bromoxynil is classified by NOHSC as a Category 3 teratogen – substances which cause concern for man owing to possible teratogenic effects but in respect of which the information is not adequate for making a satisfactory assessment. It is not mutagenic.

Diflufenican was not mutagenic, carcinogenic or teratogenic and did not show reproductive effects in animal studies. In animal studies, N-methyl-2-pyrrolidone showed a developmental toxic effect in high doses which were maternally toxic.

## 12. ECOLOGICAL INFORMATION

Dangerous to fish and aquatic organisms. Low hazard to bees.

DO NOT contaminate streams, rivers or waterways with Jaguar or the used containers.

### Ecotoxicity

#### Bromoxynil octanoate:

*Fish toxicity:* LC<sub>50</sub> (96 h) bluegill sunfish 0.06 mg/L

*Bird toxicity:* LD<sub>50</sub> bobwhite quail 170 mg/kg; mallard duck 2350 mg/kg

*Daphnia toxicity:* LC<sub>50</sub> (48 h) *Daphnia magna* 0.046 mg/L

*Algae toxicity:* EC<sub>50</sub> (96 h) *Desmodesmus subspicatus* 1 mg/L

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## 12. ECOLOGICAL INFORMATION continued

### Diflufenican:

*Fish toxicity:* LC<sub>50</sub> (96 h) rainbow trout > 109 µg/L

*Bird toxicity:* LD<sub>50</sub> bobwhite quail > 2150 mg/kg

LD<sub>50</sub> mallard duck > 4000 mg/kg

*Daphnia toxicity:* LC<sub>50</sub> (48 h) *Daphnia magna* > 240 µg/L

*Algae toxicity:* EC<sub>50</sub> (96 h) > 10 mg/L

Environmental fate,  
persistence and  
degradability,  
mobility

*Bromoxynil:* Not readily biodegradable. Bioconcentration factor (BCF): 230. In soil DT<sub>50</sub> is < 1 day, in laboratory test. Degraded by hydrolysis and debromination. Not readily biodegradable.

*Diflufenican:* Not readily biodegradable. Bioconcentration factor (BCF): 1.596. DT<sub>50</sub> varies from 85.6 – 282 days depending on soil type and water content.

*N-methyl-2-pyrrolidone* is readily biodegradable.

## 13. DISPOSAL CONSIDERATIONS

Triple or preferably pressure rinse containers before disposal. Add rinsings to spray tank. Do not dispose of undiluted chemicals on-site. If recycling, replace cap and return clean containers to recycler or designated collection point. If not recycling, break, crush or puncture and bury empty containers in a local authority landfill. If no landfill is available, bury the containers below 500 mm in a disposal pit specifically marked and set up for this purpose clear of waterways, desirable vegetation and tree roots. Empty containers or product should not be burnt. Dispose of waste material via a reputable waste disposal contractor.

## 14. TRANSPORT INFORMATION

|                                  |   |
|----------------------------------|---|
| UN number                        | UN 3082   |
| Proper shipping name             | ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S (contains bromoxynil, diflufenican)  |
| Class and Subsidiary Risk        | Class 9   |
| Packing Group                    | Packing Group III   |
| Hazchem code                     | +3Z   |
| Marine Pollutant                 | Yes – Bromoxynil is a Marine Pollutant, Class "P" (on IMDG list).   |
| Note for Road and Rail Transport | According to AU01, Environmentally Hazardous Substances in packagings, IBCs or any other receptacle not exceeding 500 kg or 500 L are not subject to the ADG Code |

## 15. REGULATORY INFORMATION

Registered according to the Agricultural and Veterinary Chemicals Code Act 1994.  
Australian Pesticides and Veterinary Medicines Authority approval number: 40383  
See also Section 2.

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|                       |
|-----------------------|
| 16. OTHER INFORMATION |
|-----------------------|

**Trademark information** Jaguar® is a Registered Trademark of Bayer.

**Preparation information** Replaces May 3, 2006 edition.  
Reasons for revision: Product codes and pack sizes, Risk phrases, Medical attention section, Hazards from combustion products, Handling, Exposure Standards, Ecological information, Transport information.

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. 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.

Our 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.

END OF MSDS