

# MATERIAL SAFETY DATA SHEET



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

## PRODUCT: GOAL\* HERBICIDE

Effective Date: 13 March 2007  
Product Code: 15124

### 1. PRODUCT AND COMPANY IDENTIFICATION:

**PRODUCT:** Goal\* Herbicide

**USES:** Agricultural Herbicide for Control of Weeds

#### 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

S36/37/39: Wear suitable protective clothing, gloves and eye/face protection.

S26: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

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

S29: Do not empty into drains.

S37: Keep container tightly closed in a cool place.

### 3. COMPOSITION/INFORMATION ON INGREDIENTS:

Ingredient	CAS #	Content
Oxyfluorfen	042874-03-3	23%
N-methyl-2-pyrrolidone (NMP)	872-50-4	10-20%
Solvent naphtha (petroleum) heavy aromatic.	64742-94-5	40-60%
Other Ingredients		5-25%
<b>Total</b>		<b>100%</b>

### 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:

#### Risk Phrases

R65: Harmful: may cause lung damage if swallowed.

R36/38: Irritating to eyes and skin.

R50: Very toxic to aquatic organisms.

#### Safety Phrases

S2: Keep out of the reach of children.

S20/21: When using do not eat, drink or smoke.

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

S23: Do not breathe vapour or spray.

S24/25: Avoid contact with skin and eyes.

### 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:** Flush eyes thoroughly with water for several minutes. Remove contact lenses after initial 1-2 minutes and continue flushing for several additional minutes. If effects occur, consult a physician, preferably 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:** For advice, contact a Poisons Information Centre. Phone 13 11 26. Do not induce vomiting unless told to do so by a Poisons 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 an ambulance (dial 000), then give artificial

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respiration; if by mouth to mouth use rescuer protection (pocket mask etc). Call a Poison Information Centre (dial 13 11 26) 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 esophageal 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 a physician. No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient.

### 5. FIRE FIGHTING MEASURES:

**FLASH POINT:** 98°C  
**METHOD USED:** SCC

**AUTO-IGNITION TEMPERATURE:** 346°C (NMP)

#### FLAMMABILITY LIMITS

UFL: 11.8% (solvent naphtha)  
LFL: 1.3% (NMP)

**EXTINGUISHING MEDIA:** When product is involved in a fire use CO<sub>2</sub>, dry chemical, water spray or foam.

**FIRE & EXPLOSION HAZARDS:** Pesticide particulates can become airborne. Combustion generates toxic fumes of the following: hydrogen chloride, hydrogen fluoride, and nitrogen oxides. Dried product can burn.

**FIRE-FIGHTING EQUIPMENT:** Remain upwind. Avoid breathing smoke. Wear self-contained breathing apparatus that conforms to relevant Australian Standards and full protective gear. Use water spray to cool containers exposed to fire. Contain run-off.

**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 footwear. Stop leak when safe to do so. Dam the 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. Spill residues 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. Dam the area of **large spills/leaks** and report them to Dow AgroSciences Emergency Services 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 or inhaled. 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 STANDARDS:** These precautions are suggested for conditions where the potential for exposure exists. Emergency conditions may require additional precautions.

Oxyfluorfen: Dow AgroSciences Industrial Hygiene Guide is 0.2 mg/m<sup>3</sup>, TWA and 1.6 mg/m<sup>3</sup>, STEL.  
NMP: TWA 25ppm; 103 mg/m<sup>3</sup> (NOHSC). STEL 75ppm; 309 mg/m<sup>3</sup> (NOHSC). AIHA WEEL 10 ppm, Skin. Interim Industrial Hygiene Guide is 500 ppm.

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 vapors or by direct skin contact. It is intended to alert the

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reader that inhalation may not be the only route of exposure and that measures to minimize dermal exposures should be considered.

'Interim Industrial Hygiene Guides' are occupational exposures limits set by the original owner of this product prior to the merger with Dow AgroSciences. These limits have not been reviewed per the Dow IHG process, but are utilized during this period of merger integration until Dow AgroSciences can formally adopt or modify.

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

**RECOMMENDATIONS FOR MANUFACTURING, COMMERCIAL BLENDING, AND PACKAGING WORKERS:**

**EYE/FACE PROTECTION:** Use chemical goggles. If exposure causes eye discomfort, use a full-face respirator that complies with Australian Standards.

**SKIN PROTECTION:** Use protective clothing chemically resistant to this material. Selection of specific items such as face shield, gloves, boots, apron, or full-body suit will depend on operation. 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.

**RESPIRATORY:** Atmospheric levels should be maintained below the exposure guideline. When respiratory protection is required for certain operations, use an air-purifying respirator that complies with Australian Standards.

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

### 9. PHYSICAL AND CHEMICAL PROPERTIES:

**APPEARANCE:** Amber Liquid

**ODOUR:** Sweet

**pH:** 7.2 to 7.5

**VAPOUR PRESSURE:** 0.29 mm Hg @ 20°C (NMP)

**VAPOR DENSITY (AIR = 1):** 5.2 (solvent, naphtha)

**BOILING POINT:** 201.7°C (NMP)  
**MELTING POINT:** -24.4°C (NMP)  
**FREEZING/MELTING POINT:**  
**SOLUBILITY IN WATER:** Emulsifiable  
**SPECIFIC GRAVITY (WATER = 1):** 1.08  
**PERCENT VOLATILITY:** 62 to 64% (estimate)  
**EVAPORATION RATE (Bac = 1):** 0.06 (NMP)  
**VISCOSITY:** 12.8 CPS

**FLASH POINT:** 98°C  
**METHOD USED:** SCC  
**AUTO-IGNITION TEMPERATURE:** 346°C (NMP)  
**FLAMMABILITY LIMITS**  
UFL: 11.8% (solvent naphtha)  
LFL: 1.3% (NMP)

**COMBUSTIBLE LIQUID:** C1

### 10. STABILITY AND REACTIVITY:

**STABILITY:** (CONDITIONS TO AVOID) Stable under normal storage conditions. Avoid contact with ignition sources (e.g. sparks, open flame, and heated surfaces).

**INCOMPATIBILITY:** (SPECIFIC MATERIALS TO AVOID) Avoid contact with the following: acids, bases, amines, oxidizing agents, halogens, and sodium hypochlorite.

**HAZARDOUS DECOMPOSITION PRODUCTS:** Thermal decomposition may yield the following: hydrogen chloride, hydrogen fluoride and nitrogen 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 moderate eye irritation. May cause slight corneal injury. Vapour may cause eye irritation experienced as mild discomfort and redness.

**SKIN:** Brief contact may cause severe skin irritation with pain and local redness. Skin contact may cause allergic skin reaction. Prolonged skin contact is unlikely to result in absorption of harmful amounts. The LD<sub>50</sub> for skin absorption in rats is >4000 mg/kg.

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**INGESTION:** Low toxicity if swallowed. Small amounts swallowed incidental to 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 LD<sub>50</sub> for rats is 2985 mg/kg (females) and 4594 mg/kg (males).

**INHALATION:** Excessive exposure may cause irritation to upper respiratory tract (nose and throat) and lungs. May cause central nervous system effects. Symptoms of excessive exposure may be anesthetic or narcotic effects; dizziness and drowsiness may be observed. The aerosol LC<sub>50</sub> for rats is >4.8 mg/L for 4 hours.

### SYSTEMIC (OTHER TARGET ORGAN EFFECTS):

Oxyfluorfen, in animals, effects have been reported on the following organs: blood, kidney, liver, spleen, bone marrow, adrenals, urinary bladder. For the other ingredients, in animals, effects have been reported on the following organs: lungs, stomach, thyroid, urinary tract, blood-forming organs (bone marrow & spleen) and liver.

**CANCER INFORMATION:** Oxyfluorfen has caused cancer in laboratory animals.

**TERATOLOGY (BIRTH DEFECTS):** Oxyfluorfen has been toxic to the foetus in laboratory animals only at doses toxic to the mother. NMP has caused toxic effects to the foetus in laboratory animals at high dose levels with either mild or undetectable maternal toxicity.

**REPRODUCTIVE EFFECTS:** For oxyfluorfen, in laboratory animal studies, effects on reproduction have been seen only at doses that produced significant toxicity to the parent animals.

**MUTAGENICITY:** For oxyfluorfen and the solvent, in-vitro and animal genetic toxicity studies were negative. For the minor component(s), in-vitro genetic toxicity studies were negative in some cases and positive in other cases. Animal genetic toxicity studies were negative.

## 12. ECOLOGICAL INFORMATION:

### ENVIRONMENTAL FATE:

**MOVEMENT & PARTITIONING:** Based largely or completely on information for oxyfluorfen.

Bioconcentration potential is moderate (BCF is between 100 and 3000 or Log Pow between 3 and 5). Measured log octanol/water partition coefficient (Log Pow) is 4.7.

**DEGRADATION & PERSISTENCE:** Based largely or completely on information for oxyfluorfen.

Biodegradation under aerobic laboratory conditions is below detectable limits (BOD<sub>20</sub> or BOD<sub>28</sub> is <2.5%). Biodegradation reached in Closed Bottle Test (OECD Test No. 301D) after 28 days is 1.2%.

**ECOTOXICOLOGY:** Based largely or completely on information for oxyfluorfen.

Material is very **highly toxic to aquatic organisms** on an acute basis (LC<sub>50</sub> or EC<sub>50</sub> is <0.1 mg/L in the most sensitive species tested).

Growth inhibition EC<sub>50</sub> in blue-green alga (*Anabaena flos-aquae*) is >0.1 mg/L.

Growth inhibition EC<sub>50</sub> in diatom (*Navicula sp.*) is 0.03 mg/L.

Growth inhibition EC<sub>50</sub> in duckweed (*Lemna sp.*) is 0.0003 mg/L.

Material is **practically non-toxic to birds** on an acute basis (LD<sub>50</sub> is >2000 mg/kg).

Material is practically non-toxic to birds on a dietary basis (LC<sub>50</sub> is >5000 ppm).

The LC<sub>50</sub> in earthworm (*Eisenia foetida*) is >1000 mg/kg.

Growth inhibition EC<sub>50</sub> in green alga (*Selenastrum capricornutum*) is >0.0029 mg/L.

## 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

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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 by the criteria of the Australian Dangerous Goods Code (ADG 6),

**MARINE and AIR:** Classified as Dangerous Goods for transport by sea and air according to the criteria of the UN Model Regulations for Transport of Dangerous goods 13<sup>th</sup> Edition.

**UN No:** 3082  
**Class:** 9  
**Packing group:** III

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**SHIPPING NAME:** ENVIRONMENTALLY HAZARDOUS SUBSTANCE, N.O.S. (OXYFLUORFEN) Marine pollutant

### 15. REGULATORY INFORMATION:

**APVMA APPROVAL NUMBER:** 54271

**POISON SCHEDULE:** S5

### 16. OTHER INFORMATION:

#### Glossary

**ACGIH:** American Conference of Governmental Industrial Hygienists.

**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).

**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.

**EC<sub>50</sub>:** 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.

**EEL:** Environmental exposure standard set by ERMA

**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<sub>oc</sub>:** the organic carbon partition coefficient (mL soil water /g organic carbon).

**K<sub>ow</sub>:** See P<sub>ow</sub>

**LC<sub>50</sub>:** Lethal Concentration 50%. A concentration of chemical in air or water that will kill 50% of the test organisms.

**LD<sub>50</sub>:** 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<sub>ow</sub>:** 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

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**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  
International Maritime Dangerous Goods Code.  
International Air Transport Association (IATA) Dangerous Goods Regulation  
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 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. 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.