

MATERIAL SAFETY DATA SHEET



Emergency Phone: 800-992-5994
Dow AgroSciences LLC
Indianapolis, IN 46268

GOAL* 2XL HERBICIDE

Effective Date: 10/22/03
Product Code: 88831
MSDS: 007733

1. PRODUCT AND COMPANY IDENTIFICATION:

PRODUCT: Goal* 2XL Herbicide

COMPANY IDENTIFICATION:

Dow AgroSciences, LLC
9330 Zionsville Road
Indianapolis, IN 46268-1189

2. COMPOSITION/INFORMATION ON INGREDIENTS:

Oxyfluorfen: 2-chloro-1-(3-ethoxy-4-nitrophenoxy)-4-(trifluoromethyl)benzene	CAS # 042874-03-3	23%
Other Ingredients, Total, Including Aromatic Solvent (Contains Naphthalene N-methylpyrrolidinone (NMP)	CAS # 064742-94-5 CAS # 000091-20-3 CAS # 000872-50-4	77%

This document is prepared pursuant to the OSHA Hazard Communication Standard (29 CFR 1910.1200). In addition, other substances not 'Hazardous' per this OSHA Standard may be listed. Where proprietary ingredient shows, the identity may be made available as provided in this standard.

3. HAZARDOUS IDENTIFICATIONS:

EMERGENCY OVERVIEW

Hazardous chemical. Amber liquid with a floral odor. May cause eye irritation with corneal injury. May cause skin irritation. LD₅₀ for skin absorption is >4000 mg/kg. Oral LD₅₀ is 2985 - 4594 mg/kg. Aerosol LC₅₀ is >4.8 mg/L for 4 hours. Toxic to aquatic organisms.

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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. Vapor 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 LD₅₀ for skin absorption in rats is >4000 mg/kg.

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 LD₅₀ 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 LC₅₀ 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. Cataracts and other eye effects have been reported in humans repeatedly exposed to naphthalene vapor or dust.

CANCER INFORMATION: Oxyfluorfen did not cause cancer in laboratory animals. Contains naphthalene, which has caused cancer in some laboratory animals.

TERATOLOGY (BIRTH DEFECTS): Oxyfluorfen has caused birth defects in laboratory animals only at doses toxic to the mother. Has been toxic to the fetus in laboratory animals only at doses toxic to the mother. NMP has caused toxic effects to the fetus 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.

4. FIRST AID:

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.

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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: Immediately call a poison control center or doctor. Do not induce vomiting unless told to do so by a poison control center 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 911 or an ambulance, then give artificial respiration; if by mouth to mouth use rescuer protection (pocket mask etc). Call a poison control center 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: 208°F (98°C)

METHOD USED: SCC

AUTO-IGNITION TEMPERATURE: 655°F (346°C) (NMP)

FLAMMABILITY LIMITS

UFL: 11.8% (solvent naphtha)

LFL: 1.3% (NMP)

EXTINGUISHING MEDIA: When product is involved in a fire use carbon dioxide, 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. Use water spray to cool containers exposed to fire. Contain run-off. Wear self-contained breathing apparatus (pressure-demand MSHA/NIOSH approved or equivalent) and full protective gear.

6. ACCIDENTAL RELEASE MEASURES:

ACTION TO TAKE FOR SPILLS/LEAKS: Eliminate all ignition sources. Ventilate the spill area. Avoid breathing the vapor. Contain spills immediately and absorb with materials such as sand or earth. Transfer liquids and solid diking material to separate suitable containers for recovery or disposal. Keep spills and cleaning runoff out of municipal sewers and open bodies of water. Report large spills to Dow AgroSciences at 800-992-5994. If exposed to material during cleanup operations, remove all contaminated clothing promptly. Wash all exposed skin areas with soap and water immediately after exposure. Thoroughly launder clothing before reuse. Do not take clothing home to be laundered.

NOTE: Spill on porous surfaces can contaminate groundwater.

7. HANDLING AND STORAGE:

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE:

HANDLING: Do not handle material near food, feed or drinking water. Ground all containers when transferring material. This material is a severe irritant.

STORAGE: The minimum recommended storage temperature for this material is 32°F (0°C). Do not store this material near food, feed or drinking water. Store away from excessive heat (e.g. steam pipes, radiators), from sources of ignition and from reactive materials. Avoid all ignition sources. Ground all metal containers during storage and handling.

OTHER: CONTAINERS ARE HAZARDOUS WHEN EMPTY. Since emptied containers retain product residue (vapors and/or liquid) follow all MSDS and label warnings even after container is emptied. Residual vapors in empty containers may explode on ignition. DO NOT cut, drill, grind or weld on or near container. Triple rinse (or equivalent) and puncture empty container. Dispose empty container in a sanitary landfill as allowed by state and local authorities.

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8. EXPOSURE CONTROLS/PERSONAL PROTECTION:

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

EXPOSURE GUIDELINE:

Oxyfluorfen: Dow AgroSciences Industrial Hygiene Guide is 0.2 mg/M³, TWA and 1.6 mg/M³, STEL.

Petroleum solvent: none established. Supplier recommends a guideline of 100 ppm for the total product, which is a mixture of aromatic hydrocarbons.

Naphthalene: ACGIH TLV is 10 ppm TWA, 15 ppm STEL, Skin, A4. OSHA PEL is 10 ppm TWA.

N-methylpyrrolidinone: AIHA WEEL is 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 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 NIOSH full-face respirator.

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 a NIOSH approved air-purifying respirator.

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

9. PHYSICAL AND CHEMICAL PROPERTIES:

COLOR: Amber

STATE: Liquid

ODOR: Floral

pH: 7.2 to 7.5

VISCOSITY: 12.8 CPS

SPECIFIC GRAVITY (WATER = 1): 1.08

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

VAPOR PRESSURE: 0.29 mm Hg @ 68°F (20°C) (NMP)

MELTING POINT: -11.9°F (-24.4°C) (NMP)

BOILING POINT: 395.1°F (201.7°C) (NMP)

SOLUBILITY IN WATER: Emulsifiable

PERCENT VOLATILITY: 62 to 64% (estimate)

EVAPORATION RATE (BAc = 1): 0.06 (NMP)

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 and hydrogen fluoride.

HAZARDOUS POLYMERIZATION: Not known to occur.

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11. TOXICOLOGICAL INFORMATION:

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.

12. ECOLOGICAL INFORMATION:

ENVIRONMENTAL FATE:

MOVEMENT & PARTITIONING:

Based 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 (Low Pow) is 4.7.

DEGRADATION & PERSISTENCE:

Based on information for oxyfluorfen.
Biodegradation under aerobic laboratory conditions is below detectable limits (BOD₂₀ or BOD₂₈ is <2.5%).
Biodegradation reached in Closed Bottle Test (OECD Test No. 301D) after 28 days is 1.2%.

ECOTOXICOLOGY:

Based on information for oxyfluorfen.
Material is very highly toxic to aquatic organisms on an acute basis (LC₅₀ or EC₅₀ is <0.1 mg/L in the most sensitive species tested).
Acute LC₅₀ in rainbow trout (*Oncorhynchus mykiss*) is 0.41 mg/L.
Acute LC₅₀ in channel catfish (*Ictalurus punctatus*) is 0.4 mg/L.
Acute LC₅₀ in bluegill (*Lepomis macrochirus*) is 0.2 mg/L.
Growth inhibition EC₅₀ in blue-green alga (*Anabaena flos-aquae*) is >0.101 mg/L.
Growth inhibition EC₅₀ in diatom (*Navicula sp.*) is 0.031 mg/L.
Growth inhibition EC₅₀ in duckweed (*Lemna sp.*) is 0.0003 mg/L.
Growth inhibition EC₅₀ in green alga (*Selenastrum capricornutum*) is >0.0029 mg/L.
Material is practically non-toxic to birds on an acute basis (LD₅₀ is >2000 mg/kg).
Material is practically non-toxic to birds on a dietary basis (LC₅₀ is >5000 ppm).
The LC₅₀ in earthworm (*Eisenia foetida*) is >1000 mg/kg.

13. DISPOSAL CONSIDERATIONS:

DISPOSAL METHOD: Do not contaminate food, feed, or water by storage or disposal. Wastes are toxic. Improper disposal of excess waste, spray mixture, or rinsate is a violation of federal law. Spray mixture or rinse water that cannot be used according to label instructions must be disposed of in accordance with applicable local, state or federal requirements. Contact your state pesticide or environmental control agency, or the hazardous waste representative at the nearest EPA regional office for guidance.

14. TRANSPORT INFORMATION:

U.S. DEPARTMENT OF TRANSPORTATION (DOT) INFORMATION:

Material is not regulated for transportation.

15. REGULATORY INFORMATION:

NOTICE: The information herein is presented in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied, is given. Regulatory requirements are subject to change and may differ from one location to another; it is the buyer's responsibility to ensure that its activities comply with federal, state or provincial, and local laws. The following specific information is made for the purpose of complying with numerous federal, state or provincial, and local laws and regulations.

U.S. REGULATIONS

SARA 313 INFORMATION: This product contains the following substances subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372:

CHEMICAL NAME	CAS NUMBER	CONCENTRATION
Naphthalene	000091-20-3	7.6%
N-methylpyrrolidinone	000872-50-4	10%

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SARA HAZARD CATEGORY: This product has been reviewed according to the EPA "Hazard Categories" promulgated under Sections 311 and 312 of the Superfund Amendment and Reauthorization Act of 1986 (SARA Title III) and is considered, under applicable definitions, to meet the following categories:

An immediate health hazard
A delayed health hazard

CALIFORNIA PROPOSITION 65: The following statement is made in order to comply with the California Safe Drinking Water and Toxic Enforcement Act of 1986:

WARNING: This product contains a chemical(s) known to the State of California to cause birth defects or other reproductive harm. N-methylpyrrolidinone is listed as a developmental toxin under PROP 65.

WARNING: This product contains a chemical known to the State of California to cause cancer. Naphthalene is listed as a carcinogen under PROP 65.

TOXIC SUBSTANCES CONTROL ACT (TSCA): All ingredients are on the TSCA inventory or are not required to be listed on the TSCA inventory.

STATE RIGHT-TO-KNOW: The following product components are cited on certain state lists as mentioned. Non-listed components may be shown in the composition section of the MSDS.

CHEMICAL NAME	CAS NUMBER	LIST
Naphthalene	000091-20-3	NJ2 NJ3 PA1 PA3
N-methylpyrrolidinone	000872-50-4	NJ2 PA1
Oxyfluorfen	042874-03-3	NJ2

NJ2=New Jersey Environmental Hazardous Substance (present at greater than or equal to 1.0%).
NJ3=New Jersey Workplace Hazardous Substance (present at greater than or equal to 1.0%).
PA1=Pennsylvania Hazardous Substance (present at greater than or equal to 1.0%).
PA3=Pennsylvania Environmental Hazardous Substance (present at greater than or equal to 1.0%).

OSHA HAZARD COMMUNICATION STANDARD: This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) RATINGS:

Health 3
Flammability 1
Reactivity 0

COMPREHENSIVE ENVIRONMENTAL RESPONSE COMPENSATION AND LIABILITY ACT (CERCLA, or SUPERFUND): This product contains the following substance(s) listed as "Hazardous Substances" under CERCLA, which may require reporting of releases:

Chemical Name	CAS#	RQ	% in Product
Naphthalene	000091-20-3	100 lbs.	7.6%

RCRA Categorization

U.S. EPA Hazardous Waste #:
Naphthalene (CAS # 000091-20-3) = U165

16. OTHER INFORMATION:

MSDS STATUS: Moved to DAS Format
Reference: DR-0385-5218
Replaces MSDS Dated: 6/1/01
Document Code: D03-843-002
Replaces Document Code: D03-843-001

The Information Herein Is Given In Good Faith, But No Warranty, Express or Implied, Is Made. Consult Dow AgroSciences for Further Information.