

MATERIAL SAFETY DATA SHEET



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

SURFLAN* A.S. HERBICIDE - ORNAMENTALS

Effective Date: 8/3/99
Product Code: 20122
MSDS: 003738

1. PRODUCT AND COMPANY IDENTIFICATION:

PRODUCT: Surflan* A.S. Herbicide - Ornamentals

COMPANY IDENTIFICATION:

Dow AgroSciences
9330 Zionsville Road
Indianapolis, IN 46268-1189

2. COMPOSITION/INFORMATION ON INGREDIENTS:

Oryzalin: 3,5-Dinitro-N4,N4-dipropyl-sulfanilamide	CAS# 019044-88-3	40.4%
Inert Ingredients, Total, Including:		59.6%
Propylene Glycol	CAS# 000057-55-6	
Glycerin	CAS# 000056-81-5	

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. Product is an opaque bright orange liquid with a slight aromatic odor. May cause slight transient eye irritation. Prolonged exposure may cause skin irritation. Water based, will not burn. Product is toxic to fish and aquatic organisms.

EMERGENCY PHONE NUMBER: 800-992-5994

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 slight transient (temporary) eye irritation. Corneal injury is unlikely.

SKIN: Prolonged exposure may cause skin irritation. Prolonged or frequently repeated skin contact may cause an allergic skin reaction in some individuals. A single prolonged exposure is not likely to result in the material being absorbed through skin in harmful amounts. The LD₅₀ for skin absorption in rabbits is >5000 mg/kg.

INGESTION: Single dose oral toxicity is low. The oral LD₅₀ for rats is 5000 mg/kg. Small amounts swallowed incidental to normal handling operations are not likely to cause injury; swallowing amounts larger than that may cause injury.

INHALATION: At room temperature, exposure to vapors are minimal due to physical properties; higher temperatures may generate vapor levels sufficient to cause irritation and other effects. The LC₅₀ for rats was >6.30 mg/L in 4 hours.

SYSTEMIC (OTHER TARGET ORGAN) EFFECTS:

Propylene glycol, in animals, has been shown to cause liver, kidney, bladder, spleen or blood effects. Human signs and symptoms may include central nervous system depression (headache, dizziness, drowsiness and incoordination).

CANCER INFORMATION: Thyroid follicular cell tumors observed in rats were considered a secondary response caused by mechanisms not relevant to humans. Benign skin and adnexal tumors observed in rats may also have been secondary to thyroid effects.

TERATOLOGY (BIRTH DEFECTS): Oryzalin did not cause birth defects, other fetal effects occurred only at doses toxic to the mother.

REPRODUCTIVE EFFECTS: Most components of this product did not interfere with reproduction. Reproductive effects seen in female animals are believed to be due to altered nutritional states resulting from extremely high doses of glycerin given in the diet. Similar effects have been seen in animals fed synthetic diets.

4. FIRST AID:

EYES: Flush eyes with plenty of water.

SKIN: Wash off in flowing water or shower.

INGESTION: If swallowed, seek medical attention. Do not induce vomiting unless directed to do so by medical personnel.

INHALATION: Remove to fresh air if effects occur. Consult a physician.

MATERIAL SAFETY DATA SHEET



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

SURFLAN* A.S. HERBICIDE - ORNAMENTALS

Effective Date: 8/3/99
Product Code: 20122
MSDS: 003738

NOTE TO PHYSICIAN: No specific antidote. Supportive care. Treatment based on judgment of the physician in response to reactions of the patient.

5. FIRE FIGHTING MEASURES:

FLASH POINT: No ignition up to 200°F (93.3°C)
METHOD USED: SCC

FLAMMABLE LIMITS

LFL: Water based product
UFL: Water based product

AUTO-IGNITION TEMPERATURE: Water based product

EXTINGUISHING MEDIA: This product is a water based suspension and will not burn.

FIRE AND EXPLOSION HAZARDS: This material will not burn until a sufficient amount of water has evaporated. At this point, the material will exhibit the flammability characteristics of propylene glycol and oryzalin. The explosive potential of oryzalin as an airborne dust is rated as severe. The minimum ignition temperature for a dust cloud is 714°F (379°C).

FIRE-FIGHTING EQUIPMENT: This product is a water based suspension and will not burn. However, if product is involved in a fire, wear positive-pressure, self-contained breathing apparatus and full protective clothing.

6. ACCIDENTAL RELEASE MEASURES:

ACTION TO TAKE FOR SPILLS: Use absorbent material to contain and clean up small spills and dispose as waste. Report large spills to Dow AgroSciences at 800-992-5994. Prevent runoff.

7. HANDLING AND STORAGE:

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: Keep out of reach of children. Harmful if swallowed, inhaled, or absorbed through the skin. Causes eye irritation. May cause skin sensitization reactions in certain individuals. Avoid contact with skin, eyes, and clothing. Avoid breathing vapor or spray mist. Do not contaminate water, food, or feed by storage or disposal. Store in original container only. Read the product label for personal protective equipment which may be required by the Worker Protection Standard of 1993.

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(S):

Propylene glycol: AIHA WEEL is 50 ppm total, 10 mg/M³ aerosol only.
Glycerin: ACGIH TLV is 10 mg/M³. OSHA PEL is 10 mg/M³ total, 5 mg/M³ respirable.
PELs are in accord with those recommended by OSHA, as in the 1989 revision of PELs.

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:

RESPIRATORY PROTECTION: Atmospheric levels should be maintained below the exposure guideline. For most conditions, no respiratory protection should be needed; however, if handling at elevated temperatures without sufficient ventilation, use a NIOSH approved air-purifying respirator.

MATERIAL SAFETY DATA SHEET



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

SURFLAN* A.S. HERBICIDE - ORNAMENTALS

Effective Date: 8/3/99
Product Code: 20122
MSDS: 003738

SKIN PROTECTION: When prolonged or frequently repeated contact could occur, use protective clothing impervious to this material. Selection of specific items such as faceshield, gloves, boots, apron, or full-body suit will depend on operation.

EYE/FACE PROTECTION: Use safety glasses.

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

9. PHYSICAL AND CHEMICAL PROPERTIES:

BOILING POINT: (@ 1 atmosphere) 212°F (100°C)
VAPOR PRESSURE: Approximately 23 mm Hg @ 25°C
VAPOR DENSITY: 1.178 relative to air @ 25°C
SOLUBILITY IN WATER: Miscible in water
SPECIFIC GRAVITY: 1.138 to 1.239 @ 25°C
APPEARANCE: Bright orange opaque liquid
ODOR: Slight aromatic odor
pH: (aqueous 50/50) 5.0 to 6.8

10. STABILITY AND REACTIVITY:

STABILITY: (CONDITIONS TO AVOID) This product is water-based and as such is stable under normal handling conditions. If the water in the mixture evaporates; however, the resultant mixture should be handled with care. The explosive potential of oryzalin as an airborne dust is rated as severe. The minimum ignition temperature for a dust cloud is 714°F (379°C)

INCOMPATIBILITY: (SPECIFIC MATERIALS TO AVOID)
None known

HAZARDOUS DECOMPOSITION PRODUCTS: Nitrogen oxides and other toxic gases and fumes may be formed if product is involved in a fire.

HAZARDOUS POLYMERIZATION: Not known to occur.

11. TOXICOLOGICAL INFORMATION:

MUTAGENICITY: For oryzalin and propylene glycol: in-vitro and animal mutagenicity studies were negative.

12. ECOLOGICAL INFORMATION:

ENVIRONMENTAL FATE:

MOVEMENT & PARTITIONING: Based largely or completely on information for oryzalin. Bioconcentration potential is low (BCF is <100 or Log Pow <3).

DEGRADATION & PERSISTENCE: Based largely or completely on information for oryzalin. Degradation is expected in the soil environment within days to weeks.

ECOTOXICOLOGY: Based largely or completely on information for oryzalin. Material is highly toxic to aquatic organisms on an acute basis (LC₅₀/EC₅₀ is between 0.1 and 1 mg/L in most sensitive species).

13. DISPOSAL CONSIDERATIONS:

DISPOSAL METHOD: Do not contaminate water, food or feed by storage or disposal. Wastes resulting from the use of this product may be used according to label directions or disposed of at an approved waste disposal facility.

14. TRANSPORT INFORMATION:

For DOT regulatory information, if required, consult transportation regulations, product shipping papers, or contact your Dow AgroSciences representative

MATERIAL SAFETY DATA SHEET



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

SURFLAN* A.S. HERBICIDE - ORNAMENTALS

Effective Date: 8/3/99
Product Code: 20122
MSDS: 003738

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
ORYZALIN	019044-88-3	40.4%

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

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
1,2,3-Propanetriol (Glycerin)	000056-81-5	PA1
1,2-Propanediol (Propylene Glycol)	000057-55-6	PA1

PA1=Pennsylvania Hazardous Substance (present at > or = 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:

CATEGORY	RATING
Health	2
Flammability	0
Reactivity	0

COMPREHENSIVE ENVIRONMENTAL RESPONSE COMPENSATION AND LIABILITY ACT (CERCLA, or SUPERFUND): To the best of our knowledge, this product contains no chemical subject to reporting under CERCLA.

16. OTHER INFORMATION:

MSDS STATUS: Revised Sections 2,3,6,8 & 15
Reference: DR-0330-8176
Replaces MSDS dated: 10/9/98
Document Code: D03-083-001
Replaces Document Code: D03-020-122

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