



1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: Engulf™ GHN Greenhouse and Ornamental Miticide
EPA Reg. No.: 228-748
Product Type: Miticide/Insecticide
Company Name: Nufarm Americas Inc.
 4020 Aerial Center Parkway
 Morrisville, NC 27560
 1-800-345-3330
Telephone Numbers: For Chemical Emergency, Spill, Leak, Fire, Exposure, or Accident,
 Call CHEMTREC Day or Night: 1-800-424-9300
 For Medical Emergencies Only, Call 1-877-325-1840

2. HAZARDS IDENTIFICATION

PHYSICAL HAZARDS:

Not Hazardous

HEALTH HAZARDS:

| | |
|--|------------|
| Specific Target Organ Toxicity (Repeated exposure) | Category 2 |
| Skin Sensitizer | Category 1 |
| Acute Toxicity – Inhalation | Category 4 |

ENVIRONMENTAL HAZARDS:

| | |
|---|------------|
| Hazardous to aquatic environment, acute | Category 1 |
| Hazardous to aquatic environment, chronic | Category 1 |

SIGNAL WORD:

WARNING

HAZARD STATEMENTS:

May cause an allergic skin reaction. Harmful if inhaled. May cause damage to organs. Very toxic to aquatic life with long lasting effects.



PRECAUTIONARY STATEMENTS

Do not breath vapors/spray. Use only outdoors on in a well-ventilated area. Wash thoroughly after handling. Do not eat drink or smoke when using this product. Contaminated work clothing must not be allowed out of the workplace. Wear protective gloves.

IF EXPOSED OR CONCERNED: call a poison control center or doctor.

IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a poison control center if you feel unwell.

IF ON SKIN: Wash with plenty of soap and water. If skin irritation or rash occurs: Get medical advice. Wash contaminated clothing before reuse.

Dispose of contents and container in accordance with local, state and federal regulations.

3. COMPOSITION / INFORMATION ON INGREDIENTS

| COMPONENTS | CAS NO. | % BY WEIGHT |
|-------------------|--------------|--------------|
| Bifenazate | 149877-41-8 | 42 - 44 |
| Other Ingredients | Trade Secret | Trade Secret |

Synonyms: Hydrazine carboxylic acid, 2-(4-methoxy[1,1'-biphenyl]-3-yl)-, 1-methylethyl ester

Ingredients not precisely identified are proprietary or non-hazardous. Values are not product specifications.

4. FIRST AID MEASURES

If Swallowed: Call a poison control center or doctor immediately for treatment advice. Do not give anything by mouth.

If on Skin or Clothing: Take off contaminated clothing. Wash with soap and water. If irritation develops, get medical attention.

If in Eyes: Hold eye open and rinse slowly and gently with water for 15 to 20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Get medical attention if irritation occurs.

If Inhaled: Move person to fresh air. Get medical attention if symptoms develop.

Most Important symptoms/effects, both acute and delayed: May cause skin sensitization (allergic reaction).

Indication of Immediate medical attention and special treatment if needed: No specific symptoms.

5. FIRE FIGHTING MEASURES

Extinguishing Media: Recommended for large fires: water spray, foam, dry chemical or carbon dioxide.

Special Fire Fighting Procedures: Firefighters should wear NIOSH approved self-contained breathing apparatus and full fire-fighting turn out gear. Dike area to prevent runoff and contamination of water sources. Dispose of fire control water later.

Unusual Fire and Explosion Hazards: Containers will burst from internal pressure under extreme fire conditions. If water is used to fight fire, contain runoff, using dikes to prevent contamination of water supplies. Dispose of fire control water later.

Hazardous Decomposition Materials (Under Fire Conditions): May produce gases such as hydrogen bromide gas, and oxides of carbon and nitrogen.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions: Wear appropriate protective gear for the situation. See Personal Protection information in Section 8. Ventilate the area.

Environmental Precautions: Prevent material from entering public sewer systems or any waterways. Do not flush to drain. Large spills to soil or similar surfaces may necessitate removal of topsoil. The affected area should be removed and placed in an appropriate container for disposal.

Methods for Containment: Dike spill using absorbent or impervious materials such as earth, sand or clay. Collect and contain contaminated absorbent and dike material for disposal.

Methods for Cleanup and Disposal: Pump any free liquid into an appropriate closed container. Clean up residual liquid with an inert absorbent material and place in an appropriate container. Decontaminate tools and equipment following cleanup. See Section 13: DISPOSAL CONSIDERATIONS for more information.

Other Information: Large spills may be reportable to the National Response Center (800-424-8802) and to state and/or local agencies.

7. HANDLING AND STORAGE

HANDLING:

Avoid contact with eyes or clothing. Wash thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco or using the toilet.

STORAGE:

Always use original container to store pesticides in a secured warehouse or storage building. Store at temperatures above 32° F. If allowed to freeze, remix before using. This does not alter the product. Containers should be opened in well-ventilated areas. Keep container tightly sealed when not in use. Do not stack cardboard cases more than two pallets high. Do not store near open containers of fertilizer, seed or other pesticides. Do not contaminate water, food or feed by storage and disposal.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash station and a safety shower.

Protective Clothing: Applicators and other handlers must wear long- sleeved shirt and long pants, shoes plus socks. For mixing and loading activities when not using a closed system, wear an apron and waterproof gloves made of barrier laminate, polyethylene, butyl rubber (≥ 14 mils), nitrile rubber (≥ 14 mils), neoprene rubber (≥ 14 mils), natural rubber (≥ 14 mils), polyvinyl chloride (≥ 14 mils), or Viton (≥ 14 mils).

General: Follow manufacturer's instructions for cleaning and maintaining PPE. If there are no such instructions for washables, use detergent and hot water. Keep and wash PPE separately from other laundry.

9. PHYSICAL AND CHEMICAL PROPERTIES

| | |
|--|--------------------------------|
| Appearance: | white opaque liquid |
| Odor: | Mildly sour |
| Odor threshold: | No data available |
| pH: | 6 - 7 (1% w/w dilution in DIW) |
| Melting point/freezing point: | No data available |
| Initial boiling point and boiling range | No data available |
| Flash point: | > 230 ° F (110°C) |
| Evaporation rate: | No data available |
| Flammability (solid, gas): | No data available |
| Upper/lower flammability or explosive limits: | No data available |
| Vapor pressure: | No data available |
| Vapor density: | No data available |
| Relative density: | 1.12 g/mL @ 25° C |
| Solubility(ies): | No data available |
| Partition coefficient: n-octanol/water: | No data available |
| Autoignition temperature: | No data available |
| Decomposition temperature: | No data available |
| Viscosity: | No data available |

Note: Physical data are typical values, but may vary from sample to sample. A typical value should not be construed as a guaranteed analysis or as a specification.

10. STABILITY AND REACTIVITY

Reactivity: Not reactive.

Chemical Stability: This material is stable under normal handling and storage conditions.

Possibility of Hazardous reactions: Reaction with oxidizers may cause fire.

Conditions to Avoid: Minimize exposure to moisture. Keep product away from excessive heat and open flame.

Incompatible Materials: Oxidizing agents: bases and acids. Hazardous chemical reaction may occur.

Hazardous Decomposition Products: Under fire conditions may produce gases such as hydrogen bromide gas, and oxides of carbon and nitrogen.

11. TOXICOLOGICAL INFORMATION

Likely Routes of Exposure: Eye and Skin contact.

Eye Contact: Non-irritating based on toxicity studies.

Skin Contact: Prolonged or frequently repeated skin contact may cause allergic reactions in some individuals. Prolonged skin contact may cause skin dryness and cracking.

Ingestion: Low toxicity of ingested.

Inhalation: Low inhalation toxicity.

Delayed, immediate and chronic effects of exposure: Prolonged or frequent repeated skin contact may cause allergic reactions in some individuals

Toxicological Data:

Data from laboratory studies conducted on this product:

Oral: Rat LD₅₀: >2000 mg/kg

Dermal: Rabbit LD₅₀: >5,000 mg/kg

Inhalation: Rat 4-hr LC₅₀: >1.94 mg/l (no mortalities at highest dose tested)

Eye Irritation: Rabbit: Non-irritating
Skin Irritation: Rabbit: Non-irritating
Skin Sensitization: Sensitizer in guinea pigs.

Data from laboratory studies conducted on Bifenazate active ingredient:

Subchronic (Target Organ) Effects: Studies in rats and dogs indicate that the liver and erythropoietic system are the primary targets in these species. Toxicity was seen in the adrenal cortex (male rats following subchronic exposure). Decreases in body weight, body-weight gain, and food consumption were also associated with liver and hematopoietic system toxicity in several studies.

Chronic Health Effects: Studies in rats and dogs indicate that the liver and erythropoietic system are the primary targets in these species. In addition, toxicity was seen in the kidney (dogs following chronic exposure).

Reproductive Toxicity: There were no reproductive effects up to the highest dose tested in a prenatal study with rabbits.

Developmental Toxicity: There was a treatment-related increase in early resorptions at all doses tested in rats. There were no developmental effects in rabbit studies.

Genotoxicity: There is no evidence of genotoxic effects.

Mutagenicity: There is no evidence of mutagenic effects.

Assessment Carcinogenicity:

This product does not contain substance that are probable or suspected human carcinogens.

12. ECOLOGICAL INFORMATION

Ecotoxicity:

Data on Bifenazate

| | | | |
|---|-----------|---|-------------|
| 96-hour LC ₅₀ Bluegill: | 0.76 mg/l | Bobwhite Quail Acute Oral LD ₅₀ : | 1,142 mg/kg |
| 96-hour LC ₅₀ Rainbow Trout: | 0.58 mg/l | Bobwhite Quail Acute Dietary LC ₅₀ : | 2,298 mg/kg |
| 48-hour EC ₅₀ Daphnia magna: | 0.50 mg/l | Mallard Duck Acute Dietary LC ₅₀ : | 726 mg/kg |
| 72-hour EC ₅₀ Algae: | 0.90 mg/l | | |

Environmental Fate: Bifenazate is immobile in the environment and is non-persistent. Bifenazate dissipates quickly in aquatic environments and also degrades quickly in soil.

13. DISPOSAL CONSIDERATIONS

Waste Disposal Method:

Wastes resulting from the use of this product may be disposed of on site or at an approved waste disposal facility. If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste representative at the nearest EPA Regional Office for guidance.

Container Handling and Disposal:

Nonrefillable Containers 5 Gallons or Less: Nonrefillable container. Do not reuse or refill this container. Offer for recycling if available. Triple rinse container (or equivalent) promptly after emptying.

Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank and drain for 10 seconds after the flow begins to drip. Fill the container 1/4 full of water and recap. Shake for 10 seconds. Pour rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times. Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or by other procedures approved by State and local authorities. Plastic containers are also disposable by incineration, or, if allowed by State and local authorities, by burning. If burned stay out of smoke.

Nonrefillable containers larger than 5 gallons: Nonrefillable container. Do not reuse or refill this container. Offer for recycling if available. If recycling or reconditioning not available, puncture and dispose of in a sanitary landfill, or by other procedures approved by State and local authorities. Plastic containers are also disposable by incineration, or, if allowed by State and local authorities, by burning. If burned stay out of smoke. Triple rinse or pressure rinse container (or equivalent) promptly after emptying.

Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank. Fill the container 1/4 full of water. Replace and tighten closures. Tip container on its side and roll it back and forth, ensuring at least one complete revolution, for 30 seconds. Stand the container on its end and tip it back and forth several times. Turn the container over onto its other end and tip it back and forth several times. Empty the rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Repeat this procedure two more

times.

14. TRANSPORTATION INFORMATION**DOT**

< 119 gallons per complete package

Non Regulated

≥ 119 gallons per complete package

UN3082, Environmentally hazardous substance, liquid, n.o.s., (Bifenazate), 9, III, Marine Pollutant

IMDG

UN3082, Environmentally hazardous substance, liquid, n.o.s., (Bifenazate), 9, III, Marine Pollutant

IATA

UN3082, Environmentally hazardous substance, liquid, n.o.s., (Bifenazate), 9, III, Marine Pollutant

15. REGULATORY INFORMATION**U.S. FEDERAL REGULATIONS****EPA FIFRA INFORMATION**

This chemical is a pesticide product registered by the United States Environmental Protection Agency and is subject to certain labeling requirements under federal pesticide law. These requirements differ from the classification criteria and hazard information required for safety data sheets (SDS), and for workplace labels of non-pesticide chemicals. The hazard information required on the pesticide label is reproduced below. The pesticide label also includes other important information, including directions for use.

CAUTION. Harmful if swallowed. Harmful if inhaled. Avoid breathing spray mist. Prolonged or frequently repeated skin contact may cause allergic reactions in some individuals.

U.S. FEDERAL REGULATIONS

TSCA Inventory: This product is exempted from TSCA because it is solely for FIFRA regulated use.

SARA Hazard Notification/Reporting:

Hazard Categories Under Criteria of SARA Title III Rules (40 CFR Part 370):

Immediate, Delayed

Section 313 Toxic Chemical(s):

None listed

Reportable Quantity (RQ) under U.S. CERCLA:

None

RCRA Waste Code:

Under RCRA, it is the responsibility of the product user to determine at the time of disposal, whether a material containing the product or derived from the product should be classified as a hazardous waste.

State Information:

Other state regulations may apply. Check individual state requirements.

California Proposition 65: Contains no listed chemicals.

16. OTHER INFORMATION**National Fire Protection Association (NFPA) Hazard Rating:**

Rating for this product: Health: 2 Flammability: 1 Reactivity: 0

Hazards Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

This Safety Data Sheet (SDS) serves different purposes than and DOES NOT REPLACE OR MODIFY THE EPA-ACCEPTED PRODUCT LABELING (attached to and accompanying the product container). This SDS provides important health, safety and environmental information for employers, employees, emergency responders and others handling large quantities of the product in activities generally other than product use, while the labeling provides that information specifically for product use in the ordinary course.

SAFETY DATA SHEET

Engulf™ GHN

Use, storage and disposal of pesticide products are regulated by the EPA under the authority of the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) through the product labeling, and all necessary and appropriate precautionary, use, storage, and disposal information is set forth on that labeling. It is a violation of Federal law to use a pesticide product in any manner not prescribed on the EPA-accepted label.

Although the information and recommendations set forth herein (hereinafter "Information") are presented in good faith and believed to be correct as of the date hereof, Nufarm Americas Inc. makes no representations as to the completeness or accuracy thereof. Information is supplied upon the condition that the persons receiving same will make their own determination as to its suitability for their purposes prior to use. In no event will Nufarm Americas Inc. be responsible for damages of any nature whatsoever resulting from the use of or reliance upon Information. NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR OF ANY OTHER NATURE ARE MADE HEREUNDER WITH RESPECT TO INFORMATION OR THE PRODUCT TO WHICH INFORMATION REFERS AND ALL SUCH WARRANTIES ARE HEREBY SPECIFICALLY DISCLAIMED.

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