



1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: Lock Down™ Herbicide
EPA Reg. No.: 71368-103
Product Type: Herbicide
Company Name: Nufarm Americas, Inc.
 11901 S. Austin Avenue
 Alsip, IL 60803
 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

This product is an EPA FIFRA registered pesticide. Some classifications on this SDS are not exactly the same as on the FIFRA label. Certain sections are superseded by federal law governed by EPA for a registered pesticide. Please see Section 15. REGULATORY INFORMATION for explanation.

2. HAZARDS IDENTIFICATION

PHYSICAL HAZARDS:

None

HEALTH HAZARDS:

Acute toxicity, inhalation	Category 4
Reproductive toxicity	Category 2

ENVIRONMENTAL HAZARDS:

None

SIGNAL WORD:

WARNING

HAZARD STATEMENTS:

Harmful if inhaled. Suspected of damaging fertility or the unborn child



PRECAUTIONARY STATEMENTS

Avoid breathing dust, mists, vapors or spray. Use only outdoors or in a well-ventilated area.

Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Contaminated work clothing should not be allowed out of the workplace. Wear protective gloves.

If inhaled: Remove person to fresh air and keep comfortable for breathing. Call a poison center if you feel unwell. See product label and Section 4 for emergency medical advice/attention.

If exposed or concerned: Get medical advice or attention.

Store locked up.

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

Hazards not otherwise classified (HNOC) Other Information

Toxic to aquatic life with long lasting effects.

<5% of the mixture consists of ingredient(s) of unknown toxicity

3. COMPOSITION / INFORMATION ON INGREDIENTS

COMPONENTS	CAS NO.	% BY WEIGHT
Flumioxazin	103361-09-7	51
Kaolin clay	1332-58-7	16
Ammonium sulfate	7783-20-2	20
Other Ingredients	Trade Secret	32

Synonyms: Flumioxazin

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

4. FIRST AID MEASURES

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. Call a poison control center or doctor for treatment advice.

If on Skin or Clothing: Take off contaminated clothing. Rinse skin immediately with plenty of water for 15 to 20 minutes. Call a poison control center or doctor for treatment advice.

If Swallowed: Call a poison control center or doctor immediately for treatment advice. Do not give any liquid to the person. Do not induce vomiting unless told to do so by the poison control center or doctor. Do not give anything by mouth to an unconscious person.

If Inhaled: Move person to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably by mouth-to-mouth, if possible. Call a poison control center or doctor for further treatment advice.

5. FIRE FIGHTING MEASURES

Extinguishing Media: Water fog, carbon dioxide, foam, dry chemical.

Fire Fighting Instructions: Will not burn but if involved in a toxic fumes may be evolved. Avoid breathing smoke and mists. Avoid personnel and equipment contact with fallout and runoff. Minimize the amount of water used for fire fighting. DO not enter any enclosed area without full protective equipment, including self-contained breathing equipment. Contain and isolate runoff and debris for proper disposal. Decontaminate personal protective equipment and firefighting equipment before reuse. Read the entire document.

Hazardous Decomposition Products: Normal combustion forms carbon dioxide, water vapor and may produce: Nitrogen compoundsw Fluorine compounds. Incomplete combustion can produce carbon monoxide.

6. ACCIDENTAL RELEASE MEASURES

For Spills on Land:

Containment: Reduce airborne dust. Avoid runoff into storm sewers or other bodies of water.

Cleanup: Clean up spill immediately. Vacuum or sweep up material and place in a chemical waste container.

Wash area with soap and water. Pick up wash liquid with additional absorbent and place in a chemical waste container.

For Spills in Water:

Containment: This material will disperse or dissolve in water. Stop the source of the release. Contain and

isolate to prevent further release into soil, surface water and ground water.

Cleanup: Clean up spill immediately. Absorb spill with inert material. Remove contaminated water for treatment or disposal.

7. HANDLING AND STORAGE

HANDLING: Do not contaminate food or feed. Do not put material into food or drink containers. Do not dilute material in food or drink containers. Users should wash hands thoroughly with soap and water before eating, drinking, chewing gum, using tobacco or using the toilet.

SAFETY DATA SHEET

Lock Down™ Herbicide

STORAGE: Keep pesticide in original container only. Store in a cool, dry place, out of direct sunlight. Do not store or transport near food or feed. Not for use or storage in or around the home.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Eye/Face Protection: Do not get this material in your eyes. Eye contact can be avoided by wearing protective eyewear.

Skin & Hand Protection: Avoid contact with skin or clothing. Skin contact should be minimized by wearing protective clothing including long pants, long-sleeved shirt and shoes plus socks and chemical-resistant gloves. Remove contaminated clothing. Wash before reuse.

Respiratory Protection: Use this material only in well ventilated areas. If ventilation is not adequate to keep airborne concentrations below recommended exposure standards, approved respiratory protection should be worn.

Exposure Guidelines:

Component	OSHA		ACGIH	
	TWA	STEL	TWA	STEL
Flumioxazin	NE	NE	NE	NE
Kaolin clay	15 mg/m ³ 5 mg/m ³	NE	2 mg/m ³ (respirable fraction)	NE
Ammonium sulfate	NE	NE	NE	NE
Other Ingredients	NE	NE	NE	NE

NE = Not Established

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Light brown solid granules
Odor:	Slight
Odor threshold:	No data available
pH:	5.4 (25°C 1% suspension)
Melting point/freezing point:	No data available
Initial boiling point and boiling range	No data available
Flash point:	No data available
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:	30.8 lb. ft. ³
Solubility(ies):	Dispersible
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: No data available.

Chemical Stability: Stable under recommended storage conditions.

Possibility of Hazardous Reactions: None under normal processing.

Conditions to Avoid: Extremes of temperature and direct sunlight.

Incompatible Materials: May react with strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.

Hazardous Decomposition Products: None known based on information supplied.

11. TOXICOLOGICAL INFORMATION**Symptoms of Exposure:**

Eye Contact: Mildly irritating based on toxicity studies.

Skin Contact: Minimally toxic and slightly irritating based on toxicity studies.

Ingestion: Slightly toxic if ingested based on toxicity studies.

Inhalation: Low inhalation toxicity based on toxicity studies.

Toxicological Data:

Data from laboratory studies conducted are summarized below:

Oral: Rat LD₅₀: > 5,000 mg/kg

Dermal: Rat LD₅₀: >2,000 mg/kg

Inhalation: Rat 4-hr LC₅₀: >2.18 mg/L

Eye Irritation: Brief and/or minor irritation

Skin Irritation: Brief and/or minor irritation

Skin Sensitization: Probable non-sensitizer

Subchronic (Target Organ) Effects: Compound related effects of Flumioxazin Technical noted in rats following subchronic exposures at high dose levels were hematotoxicity including anemia, and increases in liver, spleen, heart, kidney and thyroid weights. In dogs, the effects produced at high dose levels included a slight prolongation in activated partial thromboplastin time, increased cholesterol and phospholipid, elevated alkaline phosphatase, increased liver weights and histological changes in the liver. The lowest no-observable-effect-level (NOEL) in subchronic studies was 30 ppm in the three-month toxicity study in rats.

Chronic/Carcinogenicity: In a one year dog feeding study, Flumioxazin Technical produced treatment-related changes in blood chemistry and increased liver weights at 100 and 1000 mg/kg/day. Minimal treatment-related histological changes were noted in the livers of animals in the 1000 mg/kg/day group. Based on these data the NOEL is 10 mg/kg/day. Dietary administration of Flumioxazin Technical for 18 months produced liver changes in mice of the 3000 and 7000 ppm groups. There was no evidence of any treatment-related oncogenic effect. The NOEL for this study is 300 ppm. Dietary administration of Flumioxazin Technical for 24 months produced anemia and chronic nephropathy in rats of the 500 and 1000 ppm groups. The anemia lasted throughout the treatment period, however, it was not progressive nor aplastic in nature. No evidence of an oncogenic effect was observed. The NOEL for this study is 50 ppm.

Developmental Toxicity: Flumioxazin Technical produces developmental toxicity in rats in the absence of maternal toxicity at doses of 30 mg/kg/day by the oral route and 300 mg/kg/day by the dermal route. The developmental effects noted consisted primarily of decreased number of live fetuses and fetal weights, cardiovascular abnormalities, wavy ribs and decreased number of ossified sacrococcygeal vertebral bodies. The developmental NOEL in the rat oral and dermal developmental toxicity studies were 10 and 100 mg/kg/day, respectively. The response in rabbits was very different from that in rats. No developmental toxicity was noted in rabbits at doses up to 3000 mg/kg/day, a dose well above the maternal NOEL of 1000 mg/kg/day. Mechanistic studies indicate that the effects seen in the rat are highly unlikely to occur in the human and that flumioxazin would not be a developmental toxicant in the human.

Reproduction: Reproductive toxicity was observed in F1 males, P1 females and F1 females at 300 ppm Flumioxazin Technical, the highest dose tested and a dose that also produced signs of systemic toxicity. Toxicity was also observed in the F1 and F2 offspring at doses of 200 ppm and greater.

Mutagenicity: Flumioxazin Technical was not mutagenic in most *in vitro* assays: gene mutation and a chromosome aberration assay in the absence of metabolic activation. In three *in vivo* assays, chromosome aberration, unscheduled DNA synthesis and micronucleus assay, Flumioxazin Technical was not mutagenic. The only positive response was observed in the *in vitro* chromosome aberration assay in the presence of metabolic activation. Overall, Flumioxazin Technical does not present a genetic hazard.

12. ECOLOGICAL INFORMATION

Avian Toxicity: Based upon EPA designation, Flumioxazin Technical is practically non-toxic to avian species. The following results were obtained from studies with Flumioxazin

SAFETY DATA SHEET

Lock Down™ Herbicide

Technical:

Oral LD₅₀ bobwhite quail: greater than 2250 mg/kg
Dietary LC₅₀ bobwhite quail: greater than 5620 ppm
Dietary LC₅₀ mallard duck: greater than 5620 ppm.

Flumioxazin Technical in the diet. In mallard ducks, a slight, but not statistically significant reduction in hatchlings and 14-day old survivors was observed. Based on a possible, slight effect on egg production at 500 ppm, the NOEL for this study was 250 ppm.

Aquatic Organism Toxicity: Based upon EPA designation, Flumioxazin Technical is slightly to moderately toxic to freshwater fish; moderately toxic to freshwater invertebrates; moderately toxic to estuarine/marine fish and moderately to highly toxic to estuarine/marine invertebrates, based on the following tests:

96-hour LC ₅₀ rainbow trout:	2.3 mg/L
96-hour LC ₅₀ bluegill sunfish:	> 21 mg/L
48-hour LC ₅₀ Daphnia magna:	> 5.5 mg/L
96-hour LC ₅₀ sheepshead minnow:	> 4.7 mg/L
96-hour (shell deposition) EC ₅₀ eastern oyster:	2.8 mg/L
96-hour LC ₅₀ mysid shrimp:	0.23 mg/L
Fish early life-stage (rainbow trout): NOEC	>7.7 µg/L, <16 µg/L
Chronic toxicity (mysid shrimp): NOEC	>15 µg/L, <27 µg/L
Chronic toxicity (Daphnia magna): NOEC	>52 µg/L, <99 µg/L.

Other Non-Target Organisms Toxicity:

Flumioxazin Technical is practically non-toxic to bees. The acute contact LC₅₀ in bees was greater than 105 µg/bee.

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.

Container Disposal: Triple rinse container (or equivalent) promptly after emptying. 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.

Disposal Methods: Check government regulations and local authorities for approved disposal of this material. Dispose of in accordance with applicable laws and regulations.

14. TRANSPORTATION INFORMATION

DOT

Not Regulated

IMDG

UN 3077, Environmentally Hazardous Substance, Solid, N.O.S. (flumioxazin), Marine pollutant

IATA

UN 3077 Environmentally Hazardous Substance, Solid, N.O.S. (Flumioxazin), 9, III, Marine Pollutant

REMARKS: Single or inner packaging less than 5 L (liquid) or 5 Kg net (solids) excepted from Dangerous Goods regulations -- see UN Special Provision 375.

15. REGULATORY INFORMATION

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 inhaled or absorbed through the skin. Avoid breathing dust or spray mist. Avoid contact with eyes, skin and clothing. Causes moderate eye irritation. Keep out of reach of children.

