1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: **Maestro 4 EC**
EPA Reg. No.: 71368-78
Product Type: Herbicide

Company Name: Nufarm 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 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 Certain sections are superseded by federal law governed by EPA for a registered pesticide.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:
Not Hazardous

HEALTH HAZARDS:

Acute Toxicity (oral)	Category 4
Skin Irritant	Category 2
Skin Sensitizer	Category 1
Eye Irritation	Category 2B
Reproductive Toxicity	Category 2
Carcinogen	Category 2
Aspiration Toxicity	Category 1

ENVIRONMENTAL HAZARDS:

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

SIGNAL WORD:
DANGER

HAZARD STATEMENTS:
Harmful if swallowed. May be fatal if swallowed and enters airways. Causes eye irritation. Causes skin irritation. May cause allergic skin reaction. Suspected of causing cancer. Suspected of damaging the unborn child. Very toxic to aquatic life with long lasting effects.

PRECAUTIONARY STATEMENTS
Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Avoid breathing mist, spray or vapors. Wash hands thoroughly after handling. Do not eat, drink or smoke when using this product. Contaminated work clothing should not be allowed out of the workplace. Avoid release to the environment. Wear protective gloves, protective clothing and eye protection.

IF SWALLOWED: Immediately call a POISON CENTER or doctor. Do NOT induce vomiting.

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical attention.

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

IF exposed or concerned: Get medical advice. Collect spillage.

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

3. COMPOSITION / INFORMATION ON INGREDIENTS

COMPONENTS	CAS NO.	% BY WEIGHT
Bromoxynil octanoate	1689-99-2	27.2 – 28.8
Bromoxynil heptanoate	56634-95-8	26.2 – 27.8
Solvent Naphtha (Petroleum), Heavy Aromatic	64742-94-5	32.6 – 34.6
1-Methylnaphthalene	90-12-0	<10
2-Methylnaphthalene	91-57-6	<15
Naphthalene	91-20-3	<0.5
Other Ingredients	Trade Secret	Trade Secret

Synonyms: Mixture containing 3,5-dibromo-4-hydrobenzonitrile

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 induce vomiting. 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: Harmful or fatal if swallowed – Aspiration hazard. Causes eye and skin irritation. May cause skin sensitization (allergic reaction). Suspected of causing cancer and adverse reproductive effects.

Indication of Immediate medical attention and special treatment if needed: Immediate medical attention is required for ingestion. For ingestion there is no specific antidote available. Treat symptomatically.

Note to Physician: This product may pose an aspiration pneumonia hazard. Contains petroleum distillates.

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:
Do not get in eyes or on clothing. Avoid breathing vapors or spray mist. Keep product away from excessive heat and open flames. Use with adequate ventilation. Users should wash hands before eating, drinking, chewing gum, using tobacco or using the toilet. Remove clothing/Personal Protective Equipment (PPE) immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing. Remove PPE immediately after handling this product. Wash outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.

STORAGE:
Do not store near fertilizers or seeds. Always store pesticides in a secured warehouse or storage building.
Store at temperatures above 32° F (0° C). If allowed to freeze, remix before using. Do not contaminate water, food, or feed by storage or disposal.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering Controls:
Where engineering controls are indicated by specific use conditions or a potential for excessive exposure, use local exhaust ventilation at the point of generation.

Personal Protective Equipment:
Eye/Face Protection: To avoid contact with eyes, wear chemical goggles. An emergency eyewash or water supply should be readily accessible to the work area.
Skin Protection: To avoid contact with skin wear long-sleeved shirt and long pants, shoes plus socks, chemical resistant gloves made of any waterproof material. When mixing, loading, or cleaning equipment a chemical resistant apron must be worn. Washing facilities should be readily accessible to the work area.
Respiratory Protection: Wear NIOSH approved air-purifying respirator with cartridges/canisters approved for use against pesticides and organic vapors where the exposure limits are exceeded or exposures are excessive.
General Hygiene Considerations: Personal hygiene is an important work practice exposure control measure and the following general measures should be taken when working with or handling this material: 1) do not store, use and/or consume foods, beverages, tobacco products, or cosmetics in areas where this material is stored; 2) wash hands and face carefully before eating, drinking, using tobacco, applying cosmetics or using the toilet.

Exposure Guidelines:

	OSHA		ACGIH		
Component	**TWA**	**STEL**	**TWA**	**STEL**	**Unit**
Bromoxynil octanoate	NE	NE	NE	NE	
Bromoxynil heptanoate	NE	NE	NE	NE	
Solvent Naphtha (Petroleum), Heavy Aromatic*	NE	NE	NE	NE	
1-Methylnaphthalene	NE	NE	0.5 skin	NE	ppm
2-Methylnaphthalene	NE	NE	0.5 skin	NE	ppm
Naphthalene	10	NE	10 skin	NE	ppm
Other Ingredients	NE	NE	NE	NE	

NE = Not Established
*Manufacturer recommended limit 100 mg/m^3 total hydrocarbon vapor

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	brown liquid
Odor:	pungent
Odor threshold:	No data available
pH:	4.10 (1% w/w dilution in DIW)
Melting point/freezing point:	No data available
Initial boiling point and boiling range	No data available

Flash point:	225°F (107° C) ASTM D-93
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:	1.224 g/mL @ 20º 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:	23.295 cSt @ 20º C; 10.136 cSt @ 40º C

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: Moderately irritating based on toxicity studies.
Skin Contact: Mildly irritating based on toxicity studies. Prolonged or frequently repeated skin contact may cause allergic reactions in some individuals. Prolonged skin contact may cause skin dryness and cracking.
Ingestion: Harmful if swallowed. The petroleum hydrocarbon component, if aspirated into the respiratory system during ingestion or vomiting may cause mild or severe pulmonary injury, possibly progressing to death.
Inhalation: Low inhalation toxicity. Overexposure to petroleum hydrocarbon component may cause irritation to respiratory tract, headaches, anesthesia, drowsiness, unconsciousness and other central nervous system effects, possibly including death.
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 LD_{50}: 550 mg/kg
Dermal: Rabbit LD_{50}: >5,000 mg/kg
Inhalation: Rat 4-hr LC_{50}: >2.04 mg/l (no mortalities at highest dose tested)
Eye Irritation: Rabbit: Moderately irritating
Skin Irritation: Rabbit: Mildly irritating
Skin Sensitization: Sensitizer in guinea pigs.

Subchronic (Target Organ) Effects: Repeated overexposure to bromoxynil may cause effects to liver, kidneys and central nervous system.
Carcinogenicity / Chronic Health Effects: The U.S. EPA has classified bromoxynil as a Class C carcinogen (a possible human carcinogen), based on an increased incidence of liver tumors observed in mice.
Reproductive Toxicity: Animal tests with bromoxynil have not demonstrated reproductive effects.
Developmental Toxicity: Based upon the results of rat and rabbit teratogenicity studies, bromoxynil is considered to be a developmental toxicant. Women of childbearing age should be particularly careful when handling this product to avoid ingestion and skin contact.
Genotoxicity: There have been some positive and negative studies, but the weight of evidence is that bromoxynil is not mutagenic. Neither *in vitro* nor *in vivo* tests on bromoxynil octanoate demonstrated mutagenic effects. Bromoxynil octanoate did not induce a genotoxic effect.

Assessment Carcinogenicity:

This product contains substances that are considered to be probable or suspected human carcinogens as follows:

	Regulatory Agency Listing As Carcinogen			
Component	**ACGIH**	**IARC**	**NTP**	**OSHA**
Bromoxynil octanoate	No	No	No	No
Bromoxynil heptanoate	No	No	No	No
Solvent Naphtha (Petroleum), Light Aromatic	No	No	No	No
1-Methylnaphthalene	No	No	No	No
2-Methylnaphthalene	No	No	No	No
Naphthalene	A3	2B	Yes	No
Other Ingredients	No	No	No	No

12. ECOLOGICAL INFORMATION

Ecotoxicity:

Data on Bromoxynil Octanoate

96-hour LC_{50} Bluegill:	0.06 mg/l	Bobwhite Quail Acute Oral LD_{50}:	148 mg/kg
96-hour LC_{50} Rainbow Trout:	0.041 mg/l	Mallard Duck Acute Oral LD_{50}:	2,050 mg/kg
48-hour EC_{50} Daphnia magna:	0.046 mg/l		
120-hour EC50 Algae :	0.043 mg/l (*Navicula*) 0.22 mg/l (*Selenastrum*)		

Data on Bromoxynil Heptanoate:

96-hour LC_{50} Bluegill:	29 ppb	Bobwhite Quail 8-day Dietary LC_{50}:	4,350 ppm
48-hour EC_{50} Daphnia:	31 ppb	Bobwhite Quail Acute Oral LD_{50}:	359 mg/kg

Environmental Fate:

Bromoxynil is mobile and non-persistent. The potential for ground water contamination from bromoxynil is low; it does not exhibit the mobility or persistence characteristics of pesticides that are normally found in ground water. Environmental fate studies indicate that bromoxynil should not persist in surface waters. The aerobic aquatic metabolism study shows rapid degradation with a half-life of <12 hours.

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 with 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 with 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.

Pressure rinse as follows: Empty the remaining contents into application equipment or a mix tank and continue to drain for 10 seconds after the flow begins to drip. Hold container upside down over application equipment or mix tank or collect rinsate for later use or disposal. Insert pressure rinsing nozzle in the side of the container, and rinse at about 40 psi for at least 30 seconds. Drain for 10 seconds after the flow begins to drip.

Refillable containers larger than 5 gallons: Refillable container. Refill this container with pesticide only. Do not reuse this container for any other purpose. Cleaning the container before final disposal is the responsibility of the person disposing of the container. Cleaning before refilling is the responsibility of the refiller. To clean the container before final disposal, empty the remaining contents from this container into application equipment or a mix tank. Fill the container about 10% full with water. Agitate vigorously or recirculate water with the pump for two minutes. Pour or pump rinsate into application equipment or rinsate collection system. Repeat this rinsing procedure two more times.

14. TRANSPORTATION INFORMATION

Follow the precautions indicated in Section 7: HANDLING AND STORAGE of this SDS.

DOT

≤ 119 gallons per complete package
Non Regulated

> 119 gallons per complete package
UN 3082, Environmentally hazardous substance, liquid, n.o.s.,
(Bromoxynil octanoate, heptanoate), 9, III, MARINE POLLUTANT

IMDG

UN 3082, Environmentally hazardous substance, liquid, n.o.s.,
(Bromoxynil octanoate, heptanoate), 9, III, MARINE POLLUTANT

IATA

UN 3082, Environmentally hazardous substance, liquid, n.o.s.,
(Bromoxynil octanoate, heptanoate), 9, III

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.

WARNING. Harmful if swallowed. Causes skin irritation and moderate eye irritation. Do not get on skin or on clothing. Wear chemical-resistant gloves and protective eyewear. 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):
Acute Health, Chronic Health

Section 313 Toxic Chemical(s):
Bromoxynil octanoate (CAS No. 1689-99-2) 27.2 – 28.8% by weight.
Naphthalene (CAS No. 91-20-3) <0.5% by weight

Reportable Quantity (RQ) under U.S. CERCLA:
Naphthalene CAS No 91-20-3 100 lbs

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: WARNING. This product contains the chemicals Bromoxynil octanoate and naphthalene which are known to the State of California to cause cancer, birth defects or other reproductive harm.

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.

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.

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