

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: Maestro® 2EC Herbicide
Synonyms: Bromoxynil Octanoate Ester; Octanoic Acid Ester of Bromoxynil
EPA Reg. No.: 71368-29
Product Type: Herbicide

Company Name: Nufarm Inc.
150 Harvester Drive, Suite 200
Burr Ridge, IL 60527

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

Date of Issue: May 17, 2012 **Supersedes:** October 11, 2007
Sections Revised: 2, 4, 7, 8, 13, 14

2. HAZARDS IDENTIFICATION**Emergency Overview:**

Appearance and Odor: Brown colored liquid with aromatic odor.

Warning Statements: Keep out of reach of children. WARNING. Causes substantial but temporary eye injury. Wear protective eyewear such as goggles, face shield, or safety glasses. Harmful if swallowed, absorbed through skin, or inhaled. Do not get in eyes or on clothing. Avoid contact with skin. Avoid breathing spray mist. Prolonged or frequently repeated skin contact may cause allergic reactions in some individuals. Combustible; flash point 117° F (47° C).

Potential Health Effects:

Likely Routes of Exposure: Inhalation, eye and skin contact.

Eye Contact: Causes substantial but temporary eye injury. Vapors and mists can cause irritation.

Skin Contact: Slight toxic and slight irritating based on toxicity studies. Prolonged or frequently repeated skin contact may cause allergic reactions in some individuals.

Ingestion: Harmful if ingested. May cause nausea, vomiting, abdominal pain, weakness of arms and/or legs, dizziness, loss of coordination. 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: Harmful if inhaled. May cause upper respiratory tract irritation, coughing, wheezing, nausea, headache, depression. Overexposure to petroleum hydrocarbon component may cause irritation to respiratory tract, headaches, anesthesia, drowsiness, unconsciousness and other central nervous system effects, possibly including death.

Medical Conditions Aggravated by Exposure: Inhalation of product may aggravate existing chronic respiratory problems such as asthma, emphysema or bronchitis. Skin contact may aggravate existing skin disease.

See Section 11: TOXICOLOGICAL INFORMATION for more information.

Potential Environmental Effects:

This pesticide is toxic to wildlife and fish.

See Section 12: ECOLOGICAL INFORMATION for more information.

3. COMPOSITION / INFORMATION ON INGREDIENTS

COMPONENT	CAS NO.	% BY WEIGHT
Octanoic acid ester of bromoxynil	1689-99-2	33.4
Other Ingredients Including:		66.6
Aromatic Solvent (may contain)		
1,2,4 Trimethylbenzene	95-63-6	
Xylene	1330-20-7	
Cumene	98-82-8	
Emulsifier (may contain)		
Naphthalene	91-20-3	
1-Hexanol	111-27-3	

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 Swallowed: Call a doctor or poison control center 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 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 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.

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

5. FIRE FIGHTING MEASURES

Flash Point: 117°F (47° C) Tagliabue Closed Cup

Autoignition Temperature: Not determined

Flammability Limits: Not determined

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

Special Fire Fighting Procedures: Firefighters should wear NIOSH/MSHA 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: Combustible liquid. Can release vapors that form explosive mixtures at temperatures at or above the flash point. Containers will burst from internal pressure under extreme fire conditions. If water is used to fight fire or cool containers, dike to prevent runoff contamination of municipal sewers and waterways.

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

National Fire Protection Association (NFPA) Hazard Rating:

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

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

6. ACCIDENTAL RELEASE MEASURES

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

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 Clean-Up and Disposal: Pump any free liquid into an appropriate closed container. Collect washings for disposal. 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 contact with skin. Avoid breathing spray mist. 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. 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 or shielded safety glasses. An emergency eyewash or water supply should be readily accessible to the work area.

Skin Protection: To avoid contact with skin, wear long pants, long-sleeved shirt, socks, shoes and chemical-resistant gloves such as barrier laminate or Viton gloves. When cleaning equipment, mixing, or loading, also wear a chemical-resistant apron. An emergency shower or water supply should be readily accessible to the work area.

Respiratory Protection: Not normally required. If vapors or mists exceed acceptable levels, wear NIOSH approved air-purifying respirator with cartridges/canisters approved for use against pesticides.

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:

Component	OSHA		ACGIH		Unit
	TWA	STEL	TWA	STEL	
Bromoxynil Octanoate	NE	NE	NE	NE	
Naphthalene	10	NE	10 (Skin)	15 (Skin)	ppm
Trimethyl benzene (mixed isomers)	25	NE	25	NE	ppm
Xylene	100	NE	100	150	ppm
Cumene	50	NE	50	NE	ppm

NE = Not Established

9. PHYSICAL AND CHEMICAL PROPERTIES**Appearance and Odor:** Brown colored liquid with aromatic odor.**Boiling Point:** Not determined**Density:** 8.6 pounds/gallon**Evaporation Rate:** Not determined**Freezing Point:** 3°F (-16°C)**pH:** 4.65 @ 25°C**Solubility in Water:** Emulsifiable**Specific Gravity:** 1.032 @ 20°C**Vapor Density:** Not determined**Vapor Pressure:** Not determined**Viscosity:** 10 mPas @ 25°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**Chemical Stability:** This material is stable under normal handling and storage conditions.**Conditions to Avoid:** Avoid temperatures near or above flash point 117°F (47°C), open flame, spark and static electricity.**Incompatible Materials:** Strong oxidizing agents, bases and mineral acids.**Hazardous Decomposition Products:** Under fire conditions, may produce gases such as hydrogen bromide and oxides of carbon, nitrogen and sulfur.**Hazardous Reactions:** Hazardous polymerization will not occur.**11. TOXICOLOGICAL INFORMATION****Toxicological Data:**

Data from laboratory studies conducted on a similar, but not identical, formulation:

Oral: Rat LD₅₀: 1,428 mg/kg**Dermal:** Rabbit LD₅₀: >5,050 mg/kg**Inhalation:** Rat 4-hr LC₅₀: >3.18 mg/l**Eye Irritation:** Rabbit: Moderately irritating**Skin Irritation:** Rabbit: Slighting irritating**Skin Sensitization:** Not a contact sensitizer in guinea pigs following repeated skin exposure.**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). The emulsifier component may contain naphthalene, which is listed by IARC as a class 2B and the U.S. National Toxicology Program as reasonably anticipated to be a human carcinogen.**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: Neither *in vitro* nor *in vivo* tests on bromoxynil octanoate demonstrated mutagenic effects.

Assessment Carcinogenicity:

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

Component	Regulatory Agency Listing As Carcinogen			
	ACGIH	IARC	NTP	OSHA
Naphthalene	No	2B	Yes*	No

*Reasonably anticipated to be a human carcinogen

See Section 2: HAZARDS IDENTIFICATION for more information.

12. ECOLOGICAL INFORMATION

Ecotoxicity:

Data on Bromoxynil Octanoate

96-hour LC ₅₀ Bluegill:	0.53 mg/l	Bobwhite Quail Acute Oral LD ₅₀ :	148 mg/kg
96-hour LC ₅₀ Rainbow Trout:	0.1 mg/l	Mallard Duck Acute Oral LD ₅₀ :	2,050 mg/kg
48-hour EC ₅₀ Daphnia:	0.096 mg/l		

Environmental Fate:

Bromoxynil octanoate rapidly degrades to bromoxynil phenol. The typical half-life of bromoxynil phenol ranged from a few days to a few weeks.

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 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.

OR

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 MSDS.

DOT

≤ 119 gallons per complete package

Non Regulated – See 49 CFR 173.150)(f)

> 119 gallons per complete package

UN 1993, Combustible liquid, n.o.s. (Xylene), 3, III, MARINE POLLUTANT (Bromoxynil)

IMDG

UN 1993, Flammable liquid, n.o.s. (Xylene), 3, III, MARINE POLLUTANT (Bromoxynil)

IATA

UN 1993, Flammable liquid, n.o.s. (Xylene), 3, III, MARINE POLLUTANT (Bromoxynil)

15. REGULATORY INFORMATION

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 and Fire

Section 313 Toxic Chemical(s):

Bromoxynil octanoate (CAS No. 1689-99-2), 33.4% by weight in product

Naphthalene (CAS No. 91-20-3), 0.23% by weight in product

1,2,4 Trimethylbenzene (CAS No. 95-63-6), <20.3% by weight in product

Xylene (CAS No. 1330-20-7), <1.92% by weight in product

Cumene (CAS No. 98-82-8), <0.96% by weight in product

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

Naphthalene (CAS No. 91-20-3) 100 pounds

Xylene (CAS No. 1330-20-7) 100 pounds

Cumene (CAS No. 98-82-8) 5,000 pounds

RCRA Waste Code:

Naphthalene (CAS No. 91-20-3) U165

Xylene (CAS No. 1330-20-7) U239

Cumene (CAS No. 98-82-8) U055

State Information:

The following product components are cited on certain state lists. Check individual state requirements.

1-Hexanol (CAS No. 111-27-3) <0.45%

California Proposition 65: WARNING. This product contains chemicals known to the State of California to cause cancer or birth defects or other reproductive harm.

16. OTHER INFORMATION

This Material Safety Data Sheet (MSDS) serves different purposes than and DOES NOT REPLACE OR MODIFY THE EPA-ACCEPTED PRODUCT LABELING (attached to and accompanying the product container). This MSDS 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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