

**1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION**

**Product Name:** MAESTRO<sup>®</sup> MA Herbicide  
**EPA Reg. No.:** 71368-28  
**Synonyms:** Mixture of Bromoxynil Octanoate and MCPA 2EHE  
**Product Type:** 71368-28

**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:** July 3, 2012  
**Sections Revised:** 2, 4, 8, 13, 14

**Supersedes:** April 9, 2009

**2. HAZARDS IDENTIFICATION****Emergency Overview:**

**Appearance and Odor:** Clear amber colored liquid with slight phenolic and hydrocarbon odor.

**Warning Statements:** Keep out of reach of children. CAUTION. Harmful if swallowed or absorbed through skin or inhaled. Causes moderate eye irritation. Avoid contact with skin, eyes or clothing. Avoid breathing spray mist.

**Potential Health Effects:**

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

**Eye Contact:** Causes moderate eye irritation. Vapors and mists may cause irritation.

**Skin Contact:** Harmful if absorbed through the skin. Overexposure by skin absorption may cause irritation, redness, swelling, and symptoms similar to those for ingestion.

**Ingestion:** Harmful if swallowed. Overexposure by ingestion may cause nausea, vomiting, abdominal pain, decreased blood pressure, muscle weakness, muscle spasms and central nervous system depression. 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, incoordination. Overexposure to petroleum hydrocarbon component may cause irritation to respiratory tract, headaches, anaesthesia, 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 product 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	31.7
2-methyl-4-chlorophenoxyacetic acid, isooctyl (2-ethylhexyl) ester	29450-45-1	34.0
Other Ingredients Including:		34.3
Aromatic Solvent (may contain)		
Naphthalene	91-20-3	

**4. FIRST AID MEASURES**

**If Swallowed:** Immediately call a poison control center or doctor. Do not induce vomiting unless told to do so by a poison control center or doctor. Do not give any liquid to the person. Do not give anything by mouth to an unconscious person.

**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:** 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.

**5. FIRE FIGHTING MEASURES**

**Flash Point:** >210°F (99°C) Setaflash

**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:** 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 chloride, other chlorine compounds, hydrogen bromide, oxides of carbon and nitrogen.

**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

**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:

Avoid contact with skin, eyes or clothing. Avoid breathing spray mist. Users should wash hands before eating, drinking, chewing gum, using tobacco or using the toilet. Remove clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing. Remove Personal Protective Equipment (PPE) immediately after handling this product. Wash outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.

### Storage:

Store at temperatures above 3° F. If allowed to freeze, remix before using. Do not contaminate water, food or feed by storage and 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 face shield, goggles or safety glasses with front, brow and temple protection. 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, and shoes plus socks. Wear chemical-resistant gloves such as barrier laminate, butyl rubber, nitrile rubber, or viton when cleaning equipment, mixing, or loading any hand-held equipment. When cleaning equipment also wear a chemical-resistant apron. For overhead exposure, wear chemical-resistant headgear. 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	
MCPA 2EHE	NE	NE	NE	NE	
Naphthalene	10	NE	10 (Skin)	15 (Skin)	ppm

NE = Not Established

**9. PHYSICAL AND CHEMICAL PROPERTIES**

**Appearance and Odor:** Clear amber colored liquid with slight phenolic and hydrocarbon odor.

**Boiling Point:** Not determined

**Solubility in Water:** Emulsifiable

**Density:** 9.5 pounds/gallon

**Specific Gravity:** 1.145 @ 20°C

**Evaporation Rate:** Not determined

**Vapor Density:** Not determined

**Freezing Point:** 3°F (-16°C)

**Vapor Pressure:** Not determined

**pH:** Not determined

**Viscosity:** Not determined

**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:** Excessive heat. Do not store near heat or flame.

**Incompatible Materials:** Strong oxidizing agents: bases and acids.

**Hazardous Decomposition Products:** Under fire conditions may produce gases such as hydrogen chloride, other chlorine compounds, hydrogen bromide, oxides of carbon and nitrogen.

**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 LD<sub>50</sub>: 734 mg/kg

**Dermal:** Rabbit LD<sub>50</sub>: >5,050 mg/kg

**Inhalation:** Rat 4-hr LC<sub>50</sub>: >2.34 mg/l

**Eye Irritation:** Rabbit: Moderately irritating

**Skin Irritation:** Rabbit: Slightly 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. Repeated overexposure to MCPA may cause effects to liver, kidneys, blood chemistry, testes and gross motor function. Rare cases of peripheral nerve damage have been reported, but extensive animal studies have failed to substantiate these observations, even at high doses of MCPA for prolonged periods.

**Carcinogenicity / Chronic Health Effects:** The U.S. EPA has classified bromoxynil as a Class C carcinogen (a possible human carcinogen). The International Agency for Research on Cancer (IARC) lists exposure to Chlorophenoxy herbicides as a class 2B carcinogen, the category for limited evidence for carcinogenicity in humans. Newer MCPA lifetime feeding studies in rats and mice did not show carcinogenic potential. The hydrocarbon 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. For MCPA, testicular effects and lower male fertility have been noted in animal studies.

**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. MCPA studies in laboratory animals have shown decreased fetal body weights and delayed development in the offspring at doses toxic to mother animals.

**Genotoxicity:** Neither *in vitro* nor *in vivo* tests on bromoxynil octanoate demonstrated mutagenic effects. There have been some positive and some negative studies, but the weight of evidence is that MCPA is not mutagenic.

**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
Chlorophenoxy Herbicides	No	2B	No	No
Naphthalene	No	2B	Yes*	No

\*Reasonably anticipated to be a human carcinogen

## 12. ECOLOGICAL INFORMATION

**Ecotoxicity:**

Data on Bromoxynil Octanoate

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

Data on MCPA 2EHE

96-hour LC <sub>50</sub> Bluegill:	3.9 ± 0.7 mg/l	Bobwhite Quail Dietary LC <sub>50</sub> :	>5,620 ppm
96-hour LC <sub>50</sub> Rainbow Trout:	3.2 mg/l	Mallard Duck 8-day Dietary LC <sub>50</sub> :	>5,620 ppm
48-hour EC <sub>50</sub> Daphnia:	0.28 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. MCPA 2EHE rapidly de-esterified to parent MCPA acid in the environment. In soil, MCPA is microbially degraded with a typical half-life of approximately 10 to 14 days.

## 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. If unable to refill, offer for recycling if available or puncture and dispose of in a sanitary landfill, or by incineration, or, if allowed by state and local authorities, by burning. If burned, stay out of smoke. 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

**≥ 119 gallons per complete package**

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

##### IMDG

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

##### IATA

Non Regulated

#### 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 and Delayed

##### **Section 313 Toxic Chemical(s):**

Bromoxynil octanoate (CAS No. 1689-99-2), 21.8% equivalent by weight in product

Naphthalene (CAS No. 91-20-3), 3.1% by weight in product

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

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

**RCRA Waste Code:**

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

**State Information:**

Other state regulations may apply. Check individual state requirements.

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

<b>16. OTHER INFORMATION</b>
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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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