

MATERIAL SAFETY DATA SHEET

BIFENTHRIN MUP INSECTICIDE/MITICIDE



MSDS Ref. No.: 82657-04-3-56

Date Approved: 10/18/2004

Revision No.: 10

This document has been prepared to meet the requirements of the U.S. OSHA Hazard Communication Standard, 29 CFR 1910.1200; the EC directive, 2001/58/EC and other regulatory requirements. The information contained herein is for the concentrate as packaged, unless otherwise noted.

1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME:	BIFENTHRIN MUP INSECTICIDE/MITICIDE
PRODUCT CODE:	688
ACTIVE INGREDIENT(S):	Bifenthrin
CHEMICAL FAMILY:	Pyrethroid Pesticide
MOLECULAR FORMULA:	C ₂₃ H ₂₂ ClF ₃ O ₂ (bifenthrin)
SYNONYMS:	FMC 54800; (2-methyl[1,1'-biphenyl]-3-yl)methyl 3-(2-chloro-3,3,3-trifluoro-1-propenyl)-2,2-dimethylcyclopropanecarboxylate; IUPAC: 2-methylbiphenyl-3-ylmethyl (Z)-(1RS)-cis-3-(2-chloro-3,3,3-trifluoroprop-1-enyl)-2,2-dimethylcyclopropanecarboxylate

MANUFACTURER

FMC CORPORATION
Agricultural Products Group
1735 Market Street
Philadelphia, PA 19103
(215) 299 6000 (General Information)

EMERGENCY TELEPHONE NUMBERS

(800) 424-9300 (CHEMTREC - U.S.A. & Canada)
(202) 483-7616 (CHEMTREC - All Other Countries)
(800) 331-3148 (FMC - U.S.A. & Canada)
(716) 735-3765 (Reverse charges - FMC)

2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW:

- Brown liquid with an aromatic hydrocarbon odor.
- Moderately combustible. May support combustion if heated above the product's flash point (see Section 9, "Physical and Chemical Properties" below).
- Thermal decomposition and burning may form toxic by-products.
- For large exposures or fire, wear personal protective equipment.
- Highly toxic to fish and aquatic organisms. Keep out of drains and water courses.
- Expected to be moderately toxic if swallowed and to be moderately irritating to the skin and eyes.

POTENTIAL HEALTH EFFECTS: Effects from overexposure result from either swallowing or coming into contact with the skin. Symptoms of overexposure include bleeding from the nose, tremors and convulsions. Contact with bifenthrin may occasionally produce skin sensations such as rashes, numbing, burning or tingling. These skin sensations are reversible and usually subside within 12 hours.

MEDICAL CONDITIONS AGGRAVATED: None presently known.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Chemical Name	CAS#	Wt.%	EC No.	EC Class
Bifenthrin	82657-04-3	45 - 50	None	R25-50/53; S1/2-45-29
Aromatic Hydrocarbons	64742-95-6	<27.5	265-199-0	R10-37-51/53-65-66-67; S23-24-43A-57-60-62
1,2,4-trimethylbenzene	95-63-6	<13.8	202-436-9	R10-20-36/37/38-51/53; S2-26-61
Xylene	1330-20-7	<11	215-535-7	R10-20/21-38; S2-25
Ethylbenzene	100-41-4	<1.7	202-849-4	R11-20; S2-16-24/25-29

4. FIRST AID MEASURES

EYES: Flush with water for at least 15 minutes. If irritation occurs and persists, contact a medical doctor.

SKIN: Remove contaminated clothing and thoroughly wash with soap and water. If irritation occurs and persists, contact a medical doctor.

INGESTION: Do not induce vomiting and do not give liquids of any kind to the person. Never give anything by mouth to an unconscious person. See a medical doctor immediately.

INHALATION: Remove to fresh air. If breathing difficulty or discomfort occurs and persists, contact a medical doctor.

NOTES TO MEDICAL DOCTOR: This product is expected to have moderate oral toxicity and low dermal toxicity. It is expected to be moderately irritating to the skin and eyes. Reversible skin sensations (paresthesia) may occur and ordinary skin salves have been found useful in reducing discomfort. Contains aromatic hydrocarbons that may produce a severe pneumonitis if aspirated during vomiting. Consideration should be given to gastric lavage with an endotracheal tube in place. Treatment is otherwise controlled removal of exposure followed by symptomatic and supportive care.

5. FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA: Foam, CO₂ or dry chemical. Soft stream water fog only if necessary. Contain all runoff.

FIRE / EXPLOSION HAZARDS: Moderately combustible. When heated above the flash point, this material releases vapors which, when mixed with air, can burn or be explosive.

FIRE FIGHTING PROCEDURES: Isolate fire area. Evacuate downwind. Wear full protective clothing and self-contained breathing apparatus. Do not breathe smoke, gases or vapors generated.

6. ACCIDENTAL RELEASE MEASURES

RELEASE NOTES: Isolate and post spill area. Wear protective clothing and personal protective equipment as prescribed in Section 8, "Exposure Controls/Personal Protection". Keep unprotected persons and animals out of the area.

Keep material out of lakes, streams, ponds and sewer drains. Dike to confine spill and absorb with a non-combustible absorbent such as clay, sand or soil. Vacuum, shovel or pump waste into a drum and label contents for disposal.

To clean and neutralize spill area, tools and equipment, wash with a suitable solution of caustic or soda ash, and an appropriate alcohol (i.e., methanol, ethanol or isopropanol). Follow this by washing with a strong soap and water solution. Absorb, as above, any excess liquid and add to the drums of waste already collected. Repeat if necessary. Dispose of drummed waste according to the method outlined in Section 13, "Disposal Considerations".

7. HANDLING AND STORAGE

HANDLING AND STORAGE: Store in a cool, dry well-ventilated place. Do not use or store near heat, open flame or hot surfaces. Store in original containers only. Do not contaminate other materials, or allow this material to be contaminated, by improper storage or handling.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE LIMITS

Chemical Name	ACGIH	OSHA	Supplier
Aromatic Hydrocarbons			18 ppm

Chemical Name	ACGIH	OSHA	Supplier
1,2,4-trimethylbenzene		25 ppm (PEL)	
Xylene	150 ppm (STEL)	100 ppm (PEL)	
Ethylbenzene	100 ppm (TWA) 434 mg/m ³ (TWA) 543 mg/m ³ (STEL) 125 ppm (STEL)	100 ppm (PEL) 434 mg/m ³ (PEL)	

ENGINEERING CONTROLS: Use local exhaust at all process locations where vapor or mist may be emitted. Ventilate all transport vehicles prior to unloading.

PERSONAL PROTECTIVE EQUIPMENT

EYES AND FACE: For splash, mist or spray exposure, wear chemical protective goggles or a face shield.

RESPIRATORY: For splash, spray or mist exposure wear, as a minimum, a properly fitted half-face or full-face air-purifying respirator with organic vapor cartridges (approved by U.S. NIOSH/MSHA, EU CEN or comparable certification organization). Respirator use and selection must be based on airborne concentrations.

PROTECTIVE CLOTHING: Depending upon concentrations encountered, wear coveralls or long-sleeved uniform and head covering. For larger exposures as in the case of spills, wear full body cover barrier suit, such as a PVC suit. Leather items - such as shoes, belts and watchbands - that become contaminated should be removed and destroyed. Launder all work clothing before reuse (separately from household laundry).

GLOVES: Wear chemical protective gloves made of materials such as neoprene. Thoroughly wash the outside of gloves with soap and water prior to removal. Inspect regularly for leaks.

WORK HYGIENIC PRACTICES: Clean water should be available for washing in case of eye or skin contamination. Wash skin prior to eating, drinking or using tobacco. Shower at the end of the workday.

9. PHYSICAL AND CHEMICAL PROPERTIES

ODOR:	Aromatic hydrocarbon
APPEARANCE:	Brown liquid
DENSITY / WEIGHT PER VOLUME:	10.1 lb/gal (1210 g/L)
FLASH POINT:	48 °C (118 °F) (CC)
MELTING POINT:	57°C - 64°C (135°F - 147°F) (Bifenthrin)

MOLECULAR WEIGHT:	422.88 (bifenthrin)
SOLUBILITY IN WATER:	< 0.1 ppb (bifenthrin)
SPECIFIC GRAVITY:	1.21 SGU (water = 1)
VAPOR PRESSURE:	0.156 mg Hg (calc.)

10. STABILITY AND REACTIVITY

CONDITIONS TO AVOID:	Excessive heat and fire.
STABILITY:	Stable
POLYMERIZATION:	Will not occur
HAZARDOUS DECOMPOSITION PRODUCTS:	Carbon monoxide, carbon dioxide, hydrogen chloride and hydrogen fluoride.

11. TOXICOLOGICAL INFORMATION

EYE EFFECTS: Expected to be moderately irritating

SKIN EFFECTS: Expected to be moderately irritating

DERMAL LD₅₀: > 2,000 mg/kg (rabbit)

ORAL LD₅₀: 53.4 mg/kg (rat)

ACUTE EFFECTS FROM OVEREXPOSURE: This product is expected to have moderate oral toxicity and low dermal toxicity. It is expected to be moderately irritating to the skin and eyes. Large doses of bifenthrin ingested by laboratory animals produced signs of toxicity including convulsions, tremors and bloody nasal discharge. Bifenthrin does not cause acute delayed neurotoxicity. Experience to date indicates that contact with bifenthrin may occasionally produce skin sensations such as rashes, numbing, burning or tingling. These sensations are reversible and usually subside within 12 hours. Inhalation of aromatic hydrocarbon vapors may cause dizziness, disturbances in vision, drowsiness, respiratory irritation, and eye, skin and mucous membrane irritation. Vomiting after ingestion of this product may cause aspiration of aromatic hydrocarbons into the lungs, which may result in fatal pulmonary edema.

CHRONIC EFFECTS FROM OVEREXPOSURE: No data available for the formulation. In studies with laboratory animals, bifenthrin did not cause reproductive toxicity or teratogenicity. Tremors were associated with repeated exposure of laboratory animals to bifenthrin. In lifetime feeding studies conducted with rodents, a slight increase in the incidence of urinary bladder tumors at the highest dose in male mice was considered to be an equivocal response, not evidence of a clear compound-related effect. The overall absence of genotoxicity has been demonstrated in mutagenicity tests with bifenthrin. Chronic exposure to aromatic hydrocarbons may cause headaches, dizziness, loss of sensations or feelings (such as numbness), and liver and kidney damage. Inhalation of xylene vapors at high doses has also resulted in an increased incidence of malformations and decreases in fetal weight in

laboratory animals. Damage from xylene may be potentiated by alcohol. Under the conditions of 2-year inhalation studies, conducted by the National Toxicology Program (NTP), there was clear evidence of carcinogenic activity of ethylbenzene in male rats based on increased incidences of renal tubule neoplasms. The incidences of testicular adenoma were also increased. There was some evidence of carcinogenic activity in female rats based on increased incidences of renal tubule adenomas. There was some evidence of carcinogenic activity in male mice based on increased incidences of alveolar/bronchiolar neoplasm. There was some evidence of carcinogenic activity in female mice based on increased incidences of hepatocellular neoplasms. Studies conducted by the International Agency for Research on Cancer (IARC) showed that there is inadequate evidence in humans for the carcinogenicity of ethylbenzene and that there is sufficient evidence in experimental animals; therefore, the overall evaluation shows that ethylbenzene is possibly carcinogenic to humans (Group 2B).

CARCINOGENICITY:

Chemical Name	IARC	NTP	OSHA	Other
Ethylbenzene	Listed	Listed	Not listed	(ACGIH) Not listed

12. ECOLOGICAL INFORMATION

Unless otherwise indicated, the data presented below are for the active ingredient.

ENVIRONMENTAL DATA: Bifenthrin has moderate stability in the soil under aerobic conditions (half-life range from 65 - 125 days depending on soil type) and is stable at a wide range of pH values. Bifenthrin has a high Log Pow (>6.0), a high affinity for organic matter, and is not mobile in soil. Therefore, there is little potential for movement into ground water. There is the potential for bifenthrin to bioconcentrate (BCF = 11,750).

ECOTOXICOLOGICAL INFORMATION: Bifenthrin is highly toxic to fish and aquatic arthropods and LC₅₀ values range from 0.0038 to 17.8 µg/L. In general, the aquatic arthropods are the most sensitive species. Care should be taken to avoid contamination of the aquatic environment. Bifenthrin had no effect on mollusks at its limit of water solubility. Bifenthrin is only slightly toxic to both water fowl and upland game birds (LD₅₀ values range from 1,800 mg/kg to >2,150 mg/kg).

13. DISPOSAL CONSIDERATIONS

DISPOSAL METHOD: Open dumping or burning of this material or its packaging is prohibited. If spilled material cannot be recovered and reused, an acceptable method of disposal is to incinerate in accordance with local, state and national laws and regulations. However, because acceptable methods of disposal may vary by location, and regulatory requirements may change, the appropriate agencies should be contacted prior to disposal.

EMPTY CONTAINER: Non-returnable containers that held this material should be cleaned, prior to disposal, by triple rinsing. Containers which held this material may be cleaned by being triple-rinsed, and recycled, with the rinsate being incinerated. Do not cut or weld metal containers. Vapors that form may create an explosion hazard.

14. TRANSPORT INFORMATION

U.S. DEPARTMENT OF TRANSPORTATION (DOT)

PACKAGING TYPE:	Non-Bulk
PROPER SHIPPING NAME:	Pyrethroid pesticide, liquid, toxic, flammable
TECHNICAL NAME(S):	Bifenthrin, aromatic hydrocarbons
PRIMARY HAZARD CLASS / DIVISION:	6.1
HAZARD CLASS, SUBSIDIARY:	3
UN/NA NUMBER:	UN 3351
PACKING GROUP:	III
LABEL(S):	6.1, 3
PLACARD(S):	6.1
MARKING(S):	Pyrethroid pesticide, liquid, toxic, flammable (bifenthrin, aromatic hydrocarbons), UN3351
REPORTABLE QUANTITY (RQ):	xylene
ADDITIONAL INFORMATION:	Xylene is in an "RQ" quantity when this material meets or exceeds 909.1 pounds (90 gallons) per package.
PACKAGING TYPE:	Bulk
PROPER SHIPPING NAME:	Pyrethroid pesticide, liquid, toxic, flammable
TECHNICAL NAME(S):	Bifenthrin, aromatic hydrocarbons
PRIMARY HAZARD CLASS / DIVISION:	6.1
HAZARD CLASS, SUBSIDIARY:	3
UN/NA NUMBER:	UN 3351
PACKING GROUP:	III
MARINE POLLUTANT:	Bifenthrin
LABEL(S):	6.1, 3
PLACARD(S):	6.1
MARKING(S):	3351
REPORTABLE QUANTITY (RQ):	xylene

INTERNATIONAL MARITIME DANGEROUS GOODS (IMDG)

PACKAGING TYPE:	Non-Bulk
PROPER SHIPPING NAME:	Pyrethroid pesticide, liquid, toxic, flammable
TECHNICAL NAME(S):	Bifenthrin, aromatic hydrocarbons
PRIMARY HAZARD CLASS / DIVISION:	6.1
HAZARD CLASS, SUBSIDIARY:	3
UN/NA NUMBER:	UN 3351
PACKING GROUP:	III
MARINE POLLUTANT:	Bifenthrin
LABEL(S):	6.1, 3
PLACARD(S):	6.1 3
MARKING(S):	Pyrethroid pesticide, liquid, toxic, flammable (bifenthrin, aromatic hydrocarbons), UN3351 + Marine Pollutant
REPORTABLE QUANTITY (RQ):	xylene
ADDITIONAL INFORMATION:	Xylene is in an "RQ" quantity when this material meets or exceeds 909.1 pounds (90 gallons) per package.

ADR - EUROPEAN AGREEMENT CONCERNING THE INTERNATIONAL CARRIAGE OF DANGEROUS GOODS BY ROAD

PACKAGING TYPE:	Non-Bulk
PROPER SHIPPING NAME:	Pyrethroid pesticide, liquid, toxic, flammable
TECHNICAL NAME(S):	Bifenthrin, aromatic hydrocarbons
PRIMARY HAZARD CLASS / DIVISION:	6.1
HAZARD CLASS, SUBSIDIARY:	3
CLASSIFICATION CODE:	TF2
UN/NA NUMBER:	UN3351
PACKING GROUP:	III
HAZARD IDENTIFICATION NUMBER:	63
MARINE POLLUTANT:	Bifenthrin
LABEL(S):	6.1, 3

PLACARD(S): 6.1 3
MARKING(S): UN3351 + Marine Pollutant

**INTERNATIONAL CIVIL AVIATION ORGANIZATION (ICAO) /
INTERNATIONAL AIR TRANSPORT ASSOCIATION (IATA)**

PACKAGING TYPE: Non-Bulk
PROPER SHIPPING NAME: Pyrethroid pesticide, liquid, toxic, flammable
TECHNICAL NAME(S): Bifenthrin, aromatic hydrocarbons
PRIMARY HAZARD CLASS / DIVISION: 6.1
SUBSIDIARY RISK: 3
UN/NA NUMBER: UN3351
PACKING GROUP: III
LABEL(S): 6.1, 3
LIMITED QUANTITY: Y611 / 2L
LIMITED QUANTITY: PASSENGER / CARGO: 611 / 60L
LIMITED QUANTITY: CARGO: 618 / 220L
ADDITIONAL INFORMATION: Xylene is in an "RQ" quantity when this material meets or exceeds 909.1 pounds (90 gallons) per package.
Marks: Pyrethroid pesticide, liquid, toxic, flammable (bifenthrin, aromatic hydrocarbons), UN3351
RQ: xylene

OTHER INFORMATION:

HARMONIZED SYSTEM
Import to the U.S.A.: 3808.10.2500
Export from the U.S.A.: 3808.10.0000

15. REGULATORY INFORMATION

UNITED STATES

SARA TITLE III (SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT)

SECTION 302 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355, APPENDIX A):
Not listed

SECTION 311 HAZARD CATEGORIES (40 CFR 370):

Immediate, Delayed, Fire

SECTION 312 THRESHOLD PLANNING QUANTITY (40 CFR 370):

The Threshold Planning Quantity (TPQ) for this product, if treated as a mixture, is 10,000 lbs; however, this product contains the following ingredients with a TPQ of less than 10,000 lbs.:
None

SECTION 313 REPORTABLE INGREDIENTS (40 CFR 372):

This product contains the following ingredients subject to Section 313 reporting requirements:
Bifenthrin, 1,2,4-trimethylbenzene, Xylene (mixed isomers), Ethylbenzene

CERCLA (COMPREHENSIVE ENVIRONMENTAL RESPONSE COMPENSATION AND LIABILITY ACT)**CERCLA DESIGNATION & REPORTABLE QUANTITIES (RQ) (40 CFR 302.4):**

Listed

<u>Chemical Name</u>	<u>RQ</u>
Xylene	100 lb
Ethylbenzene	1,000 lb

INTERNATIONAL LISTINGS

Australian Hazard Code: 3XE

HAZARD, RISK AND SAFETY PHRASE DESCRIPTIONS:Bifenthrin:

EC Symbols:	T	(Toxic)
	N	(Dangerous for the environment)
EC Risk Phrases:	R25	(Toxic if swallowed.)
	R50/53	(Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.)
EC Safety Phrases:	S1/2	(Keep locked up and out of reach of children.)
	S29	(Do not empty into drains.)
	S45	(In case of accident or if you feel unwell, seek medical advice immediately - show the label where possible.)

Notes For Preparation:

CLASSIFICATION: Mandatory labeling (self-classification) of hazardous substances: applicable

Aromatic Hydrocarbons, (Index #649-356-00-4):

EC Symbols:	Xn	(Harmful)
	T	(Toxic)

EC Risk Phrases:	R10	(Flammable)
	R37	(Irritating to respiratory system.)
	R51/53	(Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.)
	R65	(Harmful: may cause lung damage if swallowed.)
	R66	(Repeated exposure may cause skin dryness or cracking.)
	R67	(Vapors may cause drowsiness and dizziness.)
EC Safety Phrases:	S23	(Do not breathe gas, fumes, vapor, or spray)
	S24	(Avoid contact with skin.)
	S43A	(In case of fire use sand, earth, chemical powder or foam.)
	S57	(Use appropriate container to avoid environmental contamination.)
	S60	(This material and its container must be disposed of as hazardous waste)
	S62	(If swallowed, do not induce vomiting: seek medical advice immediately and show this container or label.)

Notes For Preparation:

Nota H applies to the product or one or more of its components. Annex 1
 Nota P of Annex 1 applies to the product or one or more of its components.

1,2,4-trimethylbenzene, (Index #601-043-00-3):

EC Symbols:	Xi	(Irritant)
	Xn	(Harmful)
	N	(Dangerous for the environment)
EC Risk Phrases:	R10	(Flammable)
	R20	(Harmful by inhalation.)
	R36/37/38	(Irritating to eyes, respiratory system and skin.)
	R51	(Toxic to aquatic organisms.)
	R53	(May cause long-term adverse effects in the aquatic environment.)
EC Safety Phrases:	S2	(Keep out of the reach of children.)
	S26	(In case of contact with eyes, rinse immediately with plenty of water and seek medical advice)
	S61	(Avoid release to the environment. Refer to special instructions/safety data sheets.)

Xylene, (Index #601-022-00-9):

EC Symbols:	Xi	(Irritant)
	Xn	(Harmful)

EC Risk Phrases: R10 (Flammable)
R20 (Harmful by inhalation.)
R21 (Harmful in contact with skin.)
R38 (Irritating to skin)

EC Safety Phrases: S2 (Keep out of the reach of children.)
S25 (Avoid contact with eyes.)

Ethylbenzene, (Index #601-023-00-4):

EC Symbols: F (Highly Flammable)
Xn (Harmful)

EC Risk Phrases: R11 (Highly flammable)
R20 (Harmful by inhalation.)

EC Safety Phrases: S2 (Keep out of the reach of children.)
S16 (Keep away from sources of ignition - No Smoking.)
S24 (Avoid contact with skin.)
S25 (Avoid contact with eyes.)
S29 (Do not empty into drains.)

16. OTHER INFORMATION

REVISION SUMMARY:

This MSDS replaces Revision #9, dated January 11, 2002.

Changes in information are as follows:

New Format, as well as:

Section 3 (Composition / Information on Ingredients)

Section 4 (First Aid Measures)

Section 11 (Toxicological Information)

Section 14 (Transport Information)

Section 15 (Regulatory Information)

Section 16 (Other Information)

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