

# MATERIAL SAFETY DATA SHEET

Athena™ Insecticide



MSDS Ref. No.:  
Date Approved: 04/02/2009  
Revision No.: 1

This document has been prepared to meet the requirements of the U.S. OSHA Hazard Communication Standard, 29 CFR 1910.1200 and other regulatory requirements.

## 1. PRODUCT AND COMPANY IDENTIFICATION

**PRODUCT NAME:** Athena™ Insecticide

**PRODUCT CODE:** 6518

**ACTIVE INGREDIENT(S):** Bifenthrin\*; Abamectin\*\*

**CHEMICAL FAMILY:** Pyrethroid Pesticide\*, Glycoside Class\*\*

**MOLECULAR FORMULA:** C<sub>23</sub>H<sub>22</sub>ClF<sub>3</sub>O<sub>2</sub>\*, C<sub>48</sub>H<sub>72</sub>O<sub>14</sub>\*\*

**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\*;  
Mixture of (10E,14E,16E,22Z)-(1R,4S,5'S,6S,6'R, 8R,12S,13S,20R,21R,24S)-6'[(S)-sec-butyl]-21,24-dihydroxy-5',11,13,22-tetramethyl-2-oxo-3,7,19-trioxate tricyclo-[15.6.1.1(superscript 4,8)0(superscript 20,24)]pentacos-10,14,16,22-tetraene-6-spiro-2'-(5',6'-dihydro-2'H-pyran)-12-yl 2,6-dideoxy-4-O-(2,6-dideoxy-3-O-methyl-a-L-arabino-hexo pyranosyl)-3-O-methyl-a-L-arabino-hexopyranoside (i) mixture with (10E,14E,16E,22Z)-(1R,4S,5'S,6S,6'R, 8R,12S, 13S, 20R,21R,24S)-21,24-dihydroxy-6'-isopropyl-5',11,13,22-tetramethyl-2-oxo-3,7,19-trioxatetracyclo[15.6.1.1(superscript 4,8).0(superscript 20,24)]pentacos-10,14,16,22-tetraene-6-spiro-2'-(5',6'-dihydro-2'H-pyran)-12-yl 2,6-dideoxy-4-O-(2,6-dideoxy-3-O-methyl-a-L-arabino-hexopyranosyl)-3-O-methyl-a-L-arabino-hexo pyranoside (ii)\*\*

**ALTERNATE PRODUCT NAME(S):** F7954 Insecticide

**GENERAL USE:** Insecticide

**MANUFACTURER**

FMC CORPORATION  
 Agricultural Products Group  
 1735 Market Street  
 Philadelphia, PA 19103  
 (215) 299-6000 (General Information)  
 msdsinfo@fmc.com (Email - General Information)

**EMERGENCY TELEPHONE NUMBERS**

(800) 331-3148 (Medical - U.S.A. & Canada)  
 (651) 632-6793 (Medical - Collect - All Other Countries)

For leak, fire, spill, or accident emergencies, call:  
 (800) 424-9300 (CHEMTREC - U.S.A. & Canada)  
 (703) 527-3887 (CHEMTREC - Collect - All Other Countries)

**2. HAZARDS IDENTIFICATION****EMERGENCY OVERVIEW:**

- Liquid oil in water emulsion
- Slightly combustible. May support combustion at elevated temperatures.
- 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.
- Moderately toxic if swallowed.

**POTENTIAL HEALTH EFFECTS:** Effects from overexposure may result from either swallowing, inhaling or coming into contact with the skin or eyes. 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	8.84	None	T, Xn, Xi, N; R25-20-43-50/53
Abamectin	71751-41-2	1.33	265-610-3	T+, T, N; R26/28-48/25-50/53-63
Surfactant Blend		1 - 15	None	Not classified
Aromatic Hydrocarbons	64742-94-5	0 - 15	265-198-5	Xn; R65
N,N-Dimethyloctanamide	1118-92-9	0 - 5	214-272-5	
N,N-Dimethyldecanamide	14433-76-2	0 - 5	238-405-1	

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## 4. FIRST AID MEASURES

**EYES:** Flush with large quantities of water for at least 15 minutes, lifting the upper and lower eyelids intermittently. If wearing contact lenses, remove after the first five minutes and continue flushing with water. If irritation occurs and persists, get medical attention.

**SKIN:** Wash with plenty of soap and water. Get medical attention if irritation occurs and persists.

**INGESTION:** Call a poison control center or doctor immediately for treatment advice. Have person sip a glass of water if able to swallow. Do not induce vomiting unless told to do so by a poison control center or doctor. Do not give anything to an unconscious person.

**INHALATION:** Remove to fresh air. If breathing difficulty or discomfort occurs and persists, obtain medical attention.

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## 5. FIRE FIGHTING MEASURES

**EXTINGUISHING MEDIA:** Foam, CO<sub>2</sub> or dry chemical. Soft stream water fog only if necessary. Contain all runoff.

**FIRE / EXPLOSION HAZARDS:** Slightly combustible. This material may support combustion at elevated temperatures.

**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.

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## 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 contaminated area, scrub area with a solution of detergent (e.g. commercial product such as SuperSoap™, Tide®, Spic and Span®, or other high pH detergent) and water. Let solution sit for 5 minutes. Use a stiff brush to scrub affected area. Repeat if necessary to remove visible staining. Additional decontamination can be made by applying bleach (Clorox® or equivalent) to affected area.

Absorb wash-liquid as noted above, remove visibly contaminated soil and place into recovery / disposal container (plastic, open-top steel drum or equivalent). Place all clean-up material in a container, seal and dispose of in accordance with the method outlined in Section 13 "Disposal Considerations" below.

For further information on spill clean-up, waste disposal, or return of salvaged product, call the FMC Emergency Hotline number listed in Section 1 "Product and Company Identification" above.

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## 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. Keep out of reach of children and animals. Do not contaminate other pesticides, fertilizers, water, food or feed by storage or disposal.

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## 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

**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, mist or spray exposures wear, as a minimum, a properly fitted half-face or full-face air-purifying respirator which is approved for pesticides (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 rubber, neoprene, or PVC. 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, chewing gum, or using tobacco. Shower at the end of the workday.

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## 9. PHYSICAL AND CHEMICAL PROPERTIES

<b>ODOR:</b>	Not available
<b>APPEARANCE:</b>	Liquid oil in water emulsion
<b>BOILING POINT:</b>	No data available
<b>DENSITY / WEIGHT PER VOLUME:</b>	8.61 lb/gal. (1033 g/L)
<b>FLASH POINT:</b>	102.5 °C (217 °F)
<b>MOLECULAR WEIGHT:</b>	422.88 (bifenthrin); 873.11 (abamectin)
<b>pH:</b>	6.2
<b>SOLUBILITY IN WATER:</b>	Emulsion
<b>VISCOSITY:</b>	3,960 mPasec @ 22.6 °C

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## 10. STABILITY AND REACTIVITY

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

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## 11. TOXICOLOGICAL INFORMATION

**EYE EFFECTS:** Slightly irritating (rabbit)

**SKIN EFFECTS:** Mildly irritating (rabbit)

**DERMAL LD<sub>50</sub>:** > 5,000 mg/kg (rabbit)

**ORAL LD<sub>50</sub>:** 774 mg/kg (rat)

**INHALATION LC<sub>50</sub>:** > 2.03 mg/l (4 h) (rat)

**SENSITIZATION:** Non-sensitizing (guinea pig)

**ACUTE EFFECTS FROM OVEREXPOSURE:** This product has moderate oral, and low dermal and inhalation toxicity. It is slightly irritating to the eyes and mildly irritating to the skin. It is non-sensitizing to the skin. 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 laboratory animals, 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. In a 1-year oral dog study, with abamectin, dogs at the 0.5 and 1 mg/kg/day doses exhibited pupil dilation, weight loss, lethargy, tremors, and recumbency. Similar results were seen in a 2-year study with rats fed 0.75, 1.5 or 2 mg/kg/day. Rats at all dose levels exhibited body weight gains significantly higher than the controls, with a few in the high dose group exhibiting tremors. When mice were fed 8 mg/kg/day for 94-weeks, the males developed dermatitis and changes in blood formation in the spleen, while females exhibited tremors and weight loss. Rats given 0.40 mg/kg/day of abamectin had increased stillbirths, decreased pup viability, decreased lactation and decreased pup weights. These data suggest that abamectin may have the potential to cause reproductive effects at high enough doses. Abamectin is unlikely to cause teratogenic effects except at high doses toxic to the mother, it was shown to be non-mutagenic in the Ames test and was found to be non-carcinogenic in rats and mice. Animal studies indicate that abamectin may affect the nervous system. Chronic exposure to aromatic hydrocarbons may cause headaches, dizziness, loss of sensations or feelings (such as numbness), and liver and kidney damage.

### **CARCINOGENICITY:**

<b>NTP:</b>	Not listed
<b>IARC:</b>	Not listed
<b>OSHA:</b>	Not listed
<b>OTHER:</b>	Not Listed (ACGIH)

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## **12. ECOLOGICAL INFORMATION**

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

**ENVIRONMENTAL DATA:** In soil, bifenthrin is stable over a wide pH range and degrades at a slow rate that is governed by soil characteristics. Bifenthrin will also persist in aquatic sediments. Bifenthrin has a high Log Pow (6.6), 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 <2,000).

Abamectin is rapidly degraded in soil. At the soil surface, it is subject to rapid photodegradation, with half-lives of 8 hours to 1 day. When applied to soil surface and not shaded, its soil half-life is approx 1 week, while under dark, aerobic conditions, the soil half-life was 2 weeks to 2 months. Loss of abamectin from soils is thought to be due to microbial degradation. The rate of degradation was significantly decreased under anaerobic conditions. Because abamectin is nearly insoluble in water and has a strong tendency to

bind to soil particles, it is immobile in soil and unlikely to leach or contaminate groundwater. Abamectin is rapidly degraded in water. After initial distribution, its half-life in artificial pond water was 4 days. Its half-life in pond sediment was 2 to 4 weeks. It undergoes rapid photodegradation, with a half-life of 12 hours in water. When tested at pH levels common to surface and groundwater (pH 5, 7, and 9), abamectin did not hydrolyze. Plants do not absorb abamectin from the soil. It is subject to rapid degradation when present as a thin film, as on treated leaf surfaces. Under laboratory conditions, and in the presence of light, its half-life as a thin film was 4 to 6 hours.

**ECOTOXICOLOGICAL INFORMATION:** Bifenthrin is highly toxic to fish and aquatic arthropods and LC<sub>50</sub> 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 waterfowl and upland game birds (LD<sub>50</sub> values range from 1,800 mg/kg to >2,150 mg/kg).

Abamectin is highly toxic to fish and extremely toxic to aquatic invertebrates. The 96-hour LC<sub>50</sub>s are 0.003 mg/L (rainbow trout); 0.0096 mg/L (bluegill sunfish); 0.015 mg/L (sheepshead minnow); 0.024 mg/L (channel catfish); 0.042 mg/L (carp); 0.0016 mg/L (pink shrimp); 430 mg/L (eastern oysters); and, 153 mg/L (blue crab). The 48-hour LC<sub>50</sub> is 0.003 (daphnia magna). It is practically nontoxic to birds, with an LD<sub>50</sub> >2000 mg/kg and LC<sub>50</sub> 3102 ppm (bobwhite quail). While highly toxic to aquatic organisms, actual concentrations of abamectin in surface waters adjacent to treated areas are expected to be low. Abamectin did not bioaccumulate in bluegill sunfish exposed to 0.099 µg/L for 28 days in a flow-through tank. The levels in fish were from 52 - 69 times the ambient water concentration, indicating that abamectin does not accumulate or persist in fish. Abamectin is highly toxic to bees, with a 24-hour contact LC<sub>50</sub> of 0.002 µg/bee and an oral LD<sub>50</sub> of 0.009 µg/bee.

## 13. DISPOSAL CONSIDERATIONS

**DISPOSAL METHOD:** Open dumping or burning of this material or its packaging is prohibited. If spilled material cannot be disposed of by use according to label instructions, an acceptable method of disposal is to incinerate in accordance with local, state and national environmental laws, rules, standards 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

**ADDITIONAL INFORMATION:**

This material is not a hazardous material as defined by US Department of Transportation 49 CFR Part 100.100.1

185.

**PACKAGING TYPE:** Bulk

**PROPER SHIPPING NAME:** Environmentally hazardous substance, liquid, n.o.s.

**TECHNICAL NAME(S):** Bifenthrin, Abamectin

**PRIMARY HAZARD CLASS / DIVISION:** 9

**UN/NA NUMBER:** UN 3082

**PACKING GROUP:** III

**MARINE POLLUTANT:** Bifenthrin, Abamectin

**LABEL(S):** 9

**PLACARD(S):** 9

**MARKING(S):** 3082

### **INTERNATIONAL MARITIME DANGEROUS GOODS (IMDG)**

**PACKAGING TYPE:** Non-Bulk

**PROPER SHIPPING NAME:** Environmentally hazardous substance, liquid, n.o.s.

**TECHNICAL NAME(S):** Bifenthrin, Abamectin

**PRIMARY HAZARD CLASS / DIVISION:** 9

**UN/NA NUMBER:** UN 3082

**PACKING GROUP:** III

**MARINE POLLUTANT:** Bifenthrin, Abamectin

**LABEL(S):** 9

**PLACARD(S):** 9

**MARKING(S):** Environmentally hazardous substance, liquid, n.o.s. (bifenthrin, abamectin), UN3082 + Marine Pollutant

**ADDITIONAL INFORMATION:** EmS Number: F-A, S-F

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

**PACKAGING TYPE:** Non-Bulk

**PROPER SHIPPING NAME:** Environmentally hazardous substance, liquid, n.o.s.



<b>TECHNICAL NAME(S):</b>	Bifenthrin, Abamectin
<b>PRIMARY HAZARD CLASS / DIVISION:</b>	9
<b>CLASSIFICATION CODE:</b>	M6
<b>UN/NA NUMBER:</b>	UN3082
<b>PACKING GROUP:</b>	III
<b>HAZARD IDENTIFICATION NUMBER:</b>	90
<b>MARINE POLLUTANT:</b>	Bifenthrin, Abamectin
<b>LABEL(S):</b>	9
<b>MARKING(S):</b>	UN 3082 + Marine Pollutant

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

<b>PACKAGING TYPE:</b>	Non-Bulk
<b>PROPER SHIPPING NAME:</b>	Environmentally hazardous substance, liquid, n.o.s.
<b>TECHNICAL NAME(S):</b>	Bifenthrin, Abamectin
<b>PRIMARY HAZARD CLASS / DIVISION:</b>	9
<b>UN/NA NUMBER:</b>	UN3082
<b>PACKING GROUP:</b>	III
<b>LABEL(S):</b>	9
<b>LIMITED QUANTITY:</b>	Y914 / 30 kg G
<b>LIMITED QUANTITY: PASSENGER / CARGO:</b>	914 / 450 L
<b>LIMITED QUANTITY: CARGO:</b>	914 / 450 L
<b>ADDITIONAL INFORMATION:</b>	Marks: Environmentally hazardous substance, liquid, n.o.s. (bifenthrin, abamectin), UN3082 + Marine Pollutant

### **OTHER INFORMATION:** HARMONIZED SYSTEM

Import to U.S.A.: 3808.91.2500  
Export from U.S.A.: 3808.91.0000

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## **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

**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, Abamectin

**FEDERAL INSECTICIDE FUNGICIDE RODENTICIDE ACT**

U.S. EPA Signal Word: CAUTION

**HAZARD AND RISK PHRASE DESCRIPTIONS:**

EC Symbols:	T+	(Very Toxic)
	T	(Toxic)
	Xn	(Harmful)
	Xi	(Irritant)
	N	(Dangerous for the environment)
EC Risk Phrases:	R20	(Harmful by inhalation.)
	R25	(Toxic if swallowed.)
	R26/28	(Very toxic by inhalation and if swallowed)
	R43	(May cause sensitization by skin contact.)
	R48/25	(Toxic: danger of serious damage to health by prolonged exposure if swallowed.)
	R50/53	(Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.)
R65	(Harmful: may cause lung damage if swallowed.)	

**16. OTHER INFORMATION****NFPA**

Health	2
Flammability	1
Reactivity	0
Special	None

No special requirements

NFPA (National Fire Protection Association)

Degree of Hazard Code:

4 = Extreme

3 = High

2 = Moderate

1 = Slight

0 = Insignificant

**REVISION SUMMARY:**

New MSDS.

Athena and FMC Logo - Trademarks of FMC Corporation

SuperSoap - Trademark of Weba Technologies, Inc.; Tide - Trademark of Proctor and Gamble; Spic and

Span: Trademark of The Spic and Span Company; Clorox - Trademark of The Clorox Company

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