

# MATERIAL SAFETY DATA SHEET

## ASTRO™ INSECTICIDE



MSDS Ref. No.: 52645-53-1-16

Date Approved: 08/16/2004

Revision No.: 4

---

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

<b>PRODUCT NAME:</b>	ASTRO™ INSECTICIDE
<b>PRODUCT CODE:</b>	1547
<b>ACTIVE INGREDIENT(S):</b>	Permethrin
<b>CHEMICAL FAMILY:</b>	Pyrethroid Pesticide
<b>MOLECULAR FORMULA:</b>	$C_{21}H_{20}Cl_2O_3$ (permethrin)
<b>SYNONYMS:</b>	FMC 33297; (3-Phenoxyphenyl)methyl(+/-) cis-trans-3-(2,2-dichloroethenyl)-2,2-dimethylcyclopropanecarboxylate; IUPAC: 3-phenoxybenzyl (1RS)-cis-trans-3-(2,2-dichlorovinyl)-2,2-dimethylcyclopropanecarboxylate

### MANUFACTURER

FMC CORPORATION  
Agricultural Products Group  
1735 Market Street  
Philadelphia, PA 19103  
(800) 321-1362 (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:

- Amber liquid with a faint, mild petroleum 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.
- Moderately irritating to the skin.

**POTENTIAL HEALTH EFFECTS:** Effects from overexposure result from either swallowing, or coming into contact with the skin or eyes. Symptoms of overexposure include increased hypersensitivity to touch and sound, tremors and convulsions. Contact with this product has rarely produced skin sensations such as numbing, burning and tingling. These 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
Permethrin	52645-53-1	36.8	258-067-9	R22
Alkyl biphenyl mixture	69009-90-1	<27	273-683-8	Not classified
Aromatic Hydrocarbons	64742-47-8	<14.1	265-149-8	R65; S2, 23, 24, 62
Surfactant Blend		<7.6	None	Not classified

---

### 4. FIRST AID MEASURES

**EYES:** Flush with water for at least 15 minutes. If irritation occurs and persists, obtain medical attention.

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

**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, obtain medical attention.

**NOTES TO MEDICAL DOCTOR:** This product has low oral, dermal and inhalation toxicity. It is moderately irritating to the skin and minimally irritating to the 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, CO<sub>2</sub> 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 (i.e., bleach or caustic/soda ash and either ethylene glycol or 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. Store at temperatures above 40°F (5°C). If crystals form, warm to room temperature 70°F (21°C) by room heating only for 24-48 hours, and shake occasionally until crystals dissolve and product appears uniform. Do not use external source of heat for warming container. Keep out of reach of children and animals. Do not contaminate other pesticides, fertilizers, water, food or feed by storage or disposal.

---

## 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 exposure 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 nitrile, neoprene or Viton® brand. 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

<b>ODOR:</b>	Faint, mild petroleum
<b>APPEARANCE:</b>	Amber liquid
<b>DENSITY / WEIGHT PER VOLUME:</b>	8.61 lb/gal. (1033 g/L)
<b>FLASH POINT:</b>	(TCC)66 - 68°C (151 - 154°F) (TAG)
<b>MOLECULAR WEIGHT:</b>	391.3 (permethrin)
<b>pH:</b>	4.0 @ 20°C (5% in water)
<b>SOLUBILITY IN WATER:</b>	Emulsifies
<b>SPECIFIC GRAVITY:</b>	1.033 @ 20°C (water = 1)

---

## 10. STABILITY AND REACTIVITY

<b>CONDITIONS TO AVOID:</b>	Excessive heat and fire.
<b>STABILITY:</b>	Stable
<b>POLYMERIZATION:</b>	Will not occur

**HAZARDOUS DECOMPOSITION PRODUCTS:** Chlorine, hydrogen chloride, carbon dioxide, carbon monoxide, and aldehydes.

---

## 11. TOXICOLOGICAL INFORMATION

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

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

**DERMAL LD<sub>50</sub>:** > 2,000 mg/kg (rabbit)

**ORAL LD<sub>50</sub>:** 998 mg/kg (rat)

**INHALATION LC<sub>50</sub>:** > 4.3 mg/l (4 h) (rat)

**ACUTE EFFECTS FROM OVEREXPOSURE:** This product has low oral, dermal and inhalation toxicity. It is moderately irritating to the skin and minimally irritating to the eyes. Experience to date indicates that contact with this product has rarely produced skin sensations such as numbing, burning or tingling. These sensations are reversible and usually subside within 12 hours. Large toxic doses of the formulated product, administered to laboratory animals, have produced central nervous system effects with symptoms that include hypersensitivity to touch and sound, tremors, and clonic convulsions. Overexposure to animals via inhalation has also produced symptoms such as squinting eyes, irregular and rattling breathing, and ataxia. 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, permethrin did not cause reproductive toxicity or teratogenicity. Analysis of chronic feeding studies in both mice and rats with permethrin resulted in the conclusion that permethrin's potential for induction of oncogenicity in experimental animals is low and that the likelihood of oncogenic effects in humans is nonexistent or extremely low. Long-term feeding studies in animals resulted in increased liver and kidney weights, induction of the liver microsomal drug metabolizing enzyme system and histopathological changes in the lungs and liver. An overall absence of genotoxicity has been demonstrated in mutagenicity testing with permethrin. 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>	(ACGIH) Not listed

---

## 12. ECOLOGICAL INFORMATION

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

**ENVIRONMENTAL DATA:** In soil, permethrin is stable over a wide range of pH values. When applied at agricultural use rates, permethrin has a moderate rate of degradation in soil. At termiticidal use rates, permethrin degrades at a slower rate which is governed by soil characteristics. Due to its high affinity for organic matter ( $K_{oc} = 86,000$ ), there is little potential for movement in soil or entry into ground water. Permethrin has a Log Pow of 6.1, but a low potential to bioconcentrate ( $BCF = 500$ ) due to the ease with which it is metabolized.

**ECOTOXICOLOGICAL INFORMATION:** Permethrin is highly toxic to fish ( $LC_{50} = 0.5 \mu\text{g/L}$  to  $315 \mu\text{g/L}$ ) and aquatic arthropods ( $LC_{50} = 0.02 \mu\text{g/L}$  to  $7.6 \mu\text{g/L}$ ). Marine species are often more sensitive than the freshwater species. Bacteria, algae, mollusks and amphibians are much more tolerant of permethrin than the fish and arthropods. Care should be taken to avoid contamination of the aquatic environment. Permethrin is slightly toxic to birds and oral  $LD_{50}$  values are greater than  $3600 \text{ mg/kg}$ . Longer dietary studies showed that concentrations of up to 500 ppm in the diet had no effect on bird reproduction.

---

## 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 at 49 CFR Parts 100 through 185.

---

## 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:  
Permethrin

#### CERCLA (COMPREHENSIVE ENVIRONMENTAL RESPONSE COMPENSATION AND LIABILITY ACT)

##### CERCLA DESIGNATION & REPORTABLE QUANTITIES (RQ) (40 CFR 302.4):

Not listed

#### FEDERAL INSECTICIDE FUNGICIDE RODENTICIDE ACT

U.S. EPA Signal Word: CAUTION

### INTERNATIONAL LISTINGS

Australian Hazard Code: 3XE

---

## 16. OTHER INFORMATION

#### REVISION SUMMARY:

This MSDS replaces Revision #4, dated August 20, 2001.

Changes in information are as follows:

New Format, as well as:

Section 2 (Hazards Identification)

Section 4 (First Aid Measures)

Section 14 (Transport Information)

Section 16 (Other Information)

Astro and FMC Logo - FMC Trademarks  
Viton - E.I. du Pont de Nemours & Co. Trademark

© 2004 FMC Corporation. All Rights Reserved.

FMC Corporation believes that the information and recommendations contained herein (including data and statements) are accurate as of the date hereof. **NO WARRANTY OF FITNESS FOR ANY PARTICULAR PURPOSE, WARRANTY OF MERCHANTABILITY, OR ANY OTHER WARRANTY, EXPRESSED OR IMPLIED, IS MADE CONCERNING THE INFORMATION PROVIDED HEREIN.** The information provided herein relates only to the specific product designated and may not be applicable where such product is used in combination with any other materials or in any process. Use of this product is regulated by the U.S. Environmental Protection Agency (EPA). It is a violation of Federal law to use this product in a manner inconsistent with its labeling. Further, since the conditions and methods of use are beyond the control of FMC Corporation, FMC Corporation expressly disclaims any and all liability as to any results obtained or arising from any use of the product or reliance on such information.