



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.

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: Kaiso™ 24WG Insecticide
EPA Reg. No.: 228-526
Synonyms: Lambda-Cyhalothrin: [1 α (S*), 3 α (Z)] – (±)-cyano-(3-phenoxyphenyl)methyl-3-(2-chloro-3,3,3-trifluoro-1-propenyl)-2,2-dimethylcyclopropanecarboxylate
Product Type: Insecticide
Company Name: Nufarm Americas Inc.
 150 Harvester Drive, Suite 200
 Burr Ridge, IL 60527
Date of Issue: February 20, 2008 **Supersedes:** August 31, 2007
Sections Revised: 1 and 14

2. HAZARDS IDENTIFICATION

Emergency Overview:

Appearance and Odor: Tan, free-flowing granules with an acid-like odor.

Warning Statements: Keep out of reach of children. WARNING. May be fatal if swallowed. Causes substantial but temporary eye injury. Do not get in eyes. Harmful if inhaled or absorbed through skin. Avoid contact with skin or clothing. Prolonged or frequently repeated skin contact may cause allergic reaction in some individuals.

Potential Health Effects:

Likely Routes of Exposure: Inhalation, skin and eye contact

Eye Contact: Causes substantial but temporary eye injury.

Skin Contact: Slightly toxic and moderately irritating based on toxicity studies. May cause a temporary itching, tingling, burning or numbness of exposed skin, called paresthesia. Prolonged or frequently repeated skin contact may cause allergic reaction in some individuals.

Ingestion: Moderately toxic based on toxicity studies. May cause nausea, vomiting and diarrhea.

Inhalation: May irritate the respiratory tract. Avoid breathing dust, if present.

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 extremely toxic to fish and aquatic organisms and toxic to wildlife.

See Section 12: ECOLOGICAL INFORMATION for more information.

3. COMPOSITION / INFORMATION ON INGREDIENTS

COMPONENT	CAS NO.	% BY WEIGHT
Lambda-Cyhalothrin	91465-08-6	24.0
N Methyl Pyrrolidone	872-50-4	2.0
Inert Ingredients including carrier (trade secrets)		74.0

4. FIRST AID MEASURES

If Swallowed: 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 the poison control center or doctor. 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: Not applicable

Autoignition Temperature: Not applicable

Flammability Limits: Not applicable

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, hydrogen fluoride, and oxides of carbon and nitrogen.

National Fire Protection Association (NFPA) Hazard Rating:

Rating for this product: Health: 3 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 Cleanup and Disposal: If dry, sweep or scoop up material and place into container for disposal. If wet, 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. Avoid contact with skin or clothing. Prolonged or frequently repeated skin contact may cause allergic reaction in some individuals. 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 the outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.

Storage:

Store in original containers only. Keep container closed when not in use. Do not store near food or feed. 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 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, shoes, socks, and chemical-resistant gloves such as barrier laminate or viton \geq 14 mils. An emergency shower or water supply should be readily accessible to the work area.

Respiratory Protection: Not normally required. If vapors, mists or dusts 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	
Lambda-Cyhalothrin	NE	NE	NE	NE	
Dry Carrier (as nuisance dust)*	15 (T) 5 (R)	NE	NE	NE	mg/m ³
N-Methyl-2-pyrrolidinone	NE	NE	NE	NE	

* Although this formulation is designed to be non-dusty, a small amount of dust may be present due to storage and handling.

T = Total Dust
R = Respirable Fraction

NE = Not Established

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance and Odor: Tan, free-flowing granules with an acid-like odor.

Boiling Point:	Not applicable	Solubility in Water:	Dispersible
Density:	0.654 g/ml (tapped)	Specific Gravity:	Not applicable
Evaporation Rate:	Not applicable	Vapor Density:	Not applicable
Freezing Point:	Not applicable	Vapor Pressure:	Not applicable
pH:	4.31 (1% solution)	Viscosity:	Not applicable

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, hydrogen fluoride, and oxides of carbon and nitrogen.

Hazardous Reactions: Hazardous polymerization will not occur.

11. TOXICOLOGICAL INFORMATION

Toxicological Data:

Data from laboratory studies on this product are summarized below:

Oral: Rat LD₅₀: 310 mg/kg (female)

Dermal: Rat LD₅₀: >5,000 mg/kg

Eye Irritation: Rabbit: Severely irritating

Skin Irritation: Rabbit: Moderately irritating

Skin Sensitization: Guinea Pig: Sensitizing

Subchronic (Target Organ) Effects: For Lambda-Cyhalothrin, contact with exposed skin may result in temporary itching, tingling, burning or numbness, called paresthesia. The symptoms normally disappear within 24 hours. Face and genital areas are especially susceptible to this effect. Paresthesia involving the face is also known as "subjective facial sensation" or SFS. Repeated overexposure to Lambda-Cyhalothrin may effect the liver and central nervous system. Repeated overexposure to N-Methyl 2-pyrrolidinone (NMP) may cause effects to eyes, skin, respiratory system, central nervous system, liver and kidneys.

Carcinogenicity / Chronic Health Effects: Prolonged overexposure to Lambda-Cyhalothrin may effect the liver. For Lambda-Cyhalothrin, no treatment-related tumors in rats or mice. No increase in tumors was seen in rats via dietary or inhalation exposure to NMP for two years; however, an increase in liver tumors was noted in mice receiving high dietary doses over a similar period. Liver tumors are not uncommon when non-genotoxic chemicals such as NMP are tested in the mouse bioassay.

Reproductive Toxicity: In studies with animals, Lambda-Cyhalothrin was not a reproductive toxicant. NMP may adversely affect reproduction in rats after ingestion, although fertility is unaltered.

Developmental Toxicity: In studies with animals, Lambda-Cyhalothrin was not a development toxicant. Fetal developmental effects were observed following ingestion, inhalation and dermal exposures to NMP in pregnant animals, and occurred both in the presence and absence of maternal toxicity.

Genotoxicity: Animal tests with Lambda-Cyhalothrin did not demonstrate mutagenic effects. Neither *in vitro* nor *in vivo* tests on NMP demonstrated mutagenic effects.

Assessment Carcinogenicity: None listed with ACGIH, IARC, NTP or OSHA.

See Section 2: HAZARDS IDENTIFICATION for more information.

12. ECOLOGICAL INFORMATION

Ecotoxicity:

Data on Lambda-Cyhalothrin

96-hour LC ₅₀ Bluegill:	0.00021 ppm	Bobwhite Quail 8-day Dietary LC ₅₀ :	>5,300 ppm
96-hour LC ₅₀ Rainbow Trout:	0.00024 ppm	Mallard Duck 8-day Dietary LC ₅₀ :	>3,948 ppm
48-hour EC ₅₀ Daphnia:	0.00036 ppm	Mallard Duck LC ₅₀ :	3,950 mg/kg
Honey Bee Oral LD ₅₀ :	0.038 µg/bee		

Environmental Fate:

Lambda-Cyhalothrin is moderately persistent in the soil. The reported half-lives range from 4 to 12 weeks. It shows a high affinity for soil with a reported Koc of 180,000. Lambda-Cyhalothrin has extremely low water solubility and is tightly bound to soil.

13. DISPOSAL CONSIDERATIONS**Waste Disposal Method:**

Pesticide wastes are acutely hazardous. Improper disposal of excess pesticide, spray mixture, or rinsate is a violation of Federal law. If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste Representative at the nearest EPA Regional Office for guidance.

Container Handling and Disposal:

Triple rinse (or equivalent). Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill or by other procedures allowed by State and local authorities.

14. TRANSPORTATION INFORMATION

Follow the precautions indicated in Section 7: HANDLING AND STORAGE of this MSDS.

DOT

Not regulated by DOT unless shipped by water. See IMO / IMDG description.

IMO / IMDG

ENVIRONMENTALLY HAZARDOUS SUBSTANCES, SOLID, N.O.S. ,
(LAMBDA-CYHALOTHRIN, 24%), 9, UN3077, III, MARINE POLLUTANT.

IATA

Not 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):

N-Methyl-2-pyrrolidinone (CAS No. 872-50-4), 2.0% by weight in product

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

None

RCRA Waste Code:

None

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.

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.

Although the information and recommendations set forth herein (hereinafter "Information") are presented in good faith and believed to be correct as of the date hereof, Nufarm Americas Inc. makes no representations as to the completeness or accuracy thereof. Information is supplied upon the condition that the persons receiving same will make their own determination as to its suitability for their purposes prior to use. In no event will Nufarm Americas Inc. be responsible for damages of any nature whatsoever resulting from the use of or reliance upon Information. NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR OF ANY OTHER NATURE ARE MADE HEREUNDER WITH RESPECT TO INFORMATION OR THE PRODUCT TO WHICH INFORMATION REFERS.

Kaiso is a trademark of Nufarm Americas Inc.