

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: Nufarm Chlorpyrifos SPC 2 Insecticide
EPA Reg. No.: 228-625
Synonyms: Chlorpyrifos: O,O-diethyl O-(3,5,6-trichloro-2-pyridinyl) phosphorothioate
Product Type: Insecticide

Company Name: Nufarm Americas Inc.
 11901 S. Austin Avenue
 Alsip, IL 60803

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: March 11, 2013 **Supersedes:** February 24, 2011
Sections Revised: 13

2. HAZARDS IDENTIFICATION

Emergency Overview:

Appearance and Odor: Clear, amber colored liquid.

Warning Statements: Keep out of reach of children. Warning. Causes skin irritation and moderate eye irritation. Harmful if swallowed. Do not get on skin or on clothing. Avoid contact with eyes. Combustible; flash point: 155° F (68.7° C).

Potential Health Effects:

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

Eye Contact: Moderately irritating based on toxicity studies. Vapors and mist may cause irritation.

Skin Contact: Minimally toxic and severely irritating based on toxicity studies.

Ingestion: Moderately toxic based on toxicity studies. 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: Low inhalation toxicity based on toxicity studies. 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. Cholinesterase inhibitor – individuals with depressed cholinesterase levels due to other factors such as certain medications, may be more sensitive.

See Section 11: TOXICOLOGICAL INFORMATION for more information.

Potential Environmental Effects:

This product is toxic to fish, aquatic invertebrates, small mammals and birds. This product is highly toxic to bees exposed to direct treatment or residues on blooming crops or weeds.

See Section 12: ECOLOGICAL INFORMATION for more information.

MATERIAL SAFETY DATA SHEET NUFARM CHLORPYRIFOS SPC 2 INSECTICIDE

3. COMPOSITION / INFORMATION ON INGREDIENTS

COMPONENT	CAS NO.	% BY WEIGHT
Chlorpyrifos	2921-88-2	24.66
Other Ingredients Including:		75.34
Petroleum Hydrocarbon (may contain)		
Naphthalene	91-20-3	
1,2,4 Trimethylbenzene	95-63-6	

4. FIRST AID MEASURES

If Swallowed: Immediately call a poison control center or doctor. Do not induce vomiting unless told to do so by the 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 or Clothing: 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.

Note to Physician: Chlorpyrifos is a cholinesterase inhibitor. Treat symptomatically. Atropine, only by injection, is an antidote. This product is an organophosphorus ester that inhibits cholinesterase. Contains petroleum distillate – vomiting may cause aspiration pneumonia.

5. FIRE FIGHTING MEASURES

Flash Point: 155°F (68.7°C) Pensky-Martens

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: Combustible liquid. Can release vapors that form explosive mixtures at temperatures at or above the flash point. Containers will burst from internal pressure under extreme fire conditions. If water is used to fight fire or cool containers, dike to prevent runoff contamination of municipal sewers and waterways.

Hazardous Decomposition Materials (Under Fire Conditions): May produce gases such as hydrogen chloride, organic sulfides, and oxides of carbon and sulfur.

National Fire Protection Association (NFPA) Hazard Rating:

Rating for this product: Health: 3 Flammability: 2 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.

MATERIAL SAFETY DATA SHEET NUFARM CHLORPYRIFOS SPC 2 INSECTICIDE

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: 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 on skin or on clothing. Avoid contact with eyes. Users should wash thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco, or using the toilet. Remove and wash contaminated clothing before reuse.

Storage:

Store in original container in a secured dry storage area. Do not store above 122° F for extended periods of time. Preferred storage is above 32° F. Storage below 32° F may result in solidification. If warmed to above 32° F, product will return to original form. Freezing does not adversely affect this product. Dilutions of this product are sensitive to crystal formations when exposed to freezing, or near freezing temperatures (i.e., temperatures below 35° F for extended periods of time). Dilutions allowed to stand overnight should be stored at temperatures above 40° F. 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: Not normally required. To avoid contact with eyes, wear chemical goggles or shielded safety glasses. An emergency eyewash or water supply should be readily accessible to the work area.

Skin Protection: To avoid contact with skin wear coveralls over long-sleeved shirt and long pants, chemical-resistant footwear plus socks, chemical-resistant gloves, and chemical-resistant headgear for overhead exposures. Wear a chemical-resistant apron when mixing, loading or exposed to the concentrate. An emergency shower or water supply should be readily accessible to the work area.

Respiratory Protection: Not normally required, except for all mixers, loaders, other applicators and other handlers who must wear a NIOSH-approved dust mist filtering respirator with MSHA/NIOSH approved prefix TC-21C or a NIOSH-approved respirator with any N, R, P or HE filter. In other situations 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.

MATERIAL SAFETY DATA SHEET NUFARM CHLORPYRIFOS SPC 2 INSECTICIDE

Exposure Guidelines:

Component	OSHA		ACGIH		Unit
	TWA	STEL	TWA	STEL	
Chlorpyrifos	NE	NE	0.1(IFV) (Skin, BEI)	NE	mg/m ³
Naphthalene	10	NE	10 (Skin)	15 (Skin)	ppm
Trimethyl benzene (mixed isomers)	25	NE	25	NE	ppm

IFV = Inhalable Fraction and Vapor

NE = Not Established

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance and Odor: Clear, amber colored liquid.

Boiling Point: Not determined

Density: 8.3 pounds/gallon

Evaporation Rate: Not determined

Freezing Point: Not determined

pH: 4 – 5 (1% solution)

Solubility in Water: Emulsifiable

Specific Gravity: 0.994 @ 20°C

Vapor Density: Not determined

Vapor Pressure: Not determined

Viscosity: 2.444 cSt @ 20°C

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: Avoid temperatures near or above flash point 155° F (68.7° C), open flame, spark and static electricity.

Incompatible Materials: Strong oxidizing agents and bases.

Hazardous Decomposition Products: Under fire conditions may produce gases such as hydrogen chloride, organic sulfides, and oxides of carbon and sulfur.

Hazardous Reactions: Hazardous polymerization will not occur.

11. TOXICOLOGICAL INFORMATION

Toxicological Data:

Except as noted, data from laboratory studies conducted on a similar, but not identical, formulation:

Oral: Rat LD₅₀: 654 mg/kg (female) (estimated based on mortalities for doses tested)

Dermal: Rat LD₅₀: >5,000 mg/kg

Inhalation: Rat 4-hr LC₅₀: >2.03 mg/L

Eye Irritation: Rabbit: Moderately irritating (data on this product)

Skin Irritation: Rabbit: Severely irritating

Skin Sensitization: Not a contact sensitizer in guinea pigs following repeated skin exposure.

Symptoms of Cholinesterase Inhibition: Chlorpyrifos is a cholinesterase inhibitor. Signs and symptoms of cholinesterase inhibition may include, but may not be limited to, headache, dizziness, incoordination, muscle twitching, weakness, nausea, vomiting, diarrhea, constriction of the pupil of the eye, blurred or dark vision, excessive salivation or nasal discharge, profuse sweating and abdominal cramps. Incontinence, unconsciousness, convulsions and breathing difficulties are indicative of severe poisoning. In untreated severe poisoning, death is due to respiratory failure or cardiac arrest.

Subchronic (Target Organ) Effects: Prolonged overexposure to chlorpyrifos may show same effects as those associated with cholinesterase inhibition. Repeated overexposure to chlorpyrifos may cause effects to adrenal gland.

Carcinogenicity / Chronic Health Effects: Prolonged overexposure to chlorpyrifos may show same effects as those associated with cholinesterase inhibition. Chlorpyrifos did not cause cancer in laboratory

MATERIAL SAFETY DATA SHEET NUFARM CHLORPYRIFOS SPC 2 INSECTICIDE

animal studies. 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: Chlorpyrifos did not interfere with in laboratory animal studies. Some evidence of toxicity in the offspring occurred, but only at doses toxic to the parent animals.

Developmental Toxicity: Chlorpyrifos did not cause birth defects in laboratory animals.

Genotoxicity: There have been some positive and some negative studies, but the weight of evidence is that chlorpyrifos is considered to have minimal mutagenic potential.

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
Naphthalene	No	2B	Yes*	No

*Reasonably anticipated to be a human carcinogen

See Section 2: HAZARDS IDENTIFICATION for more information.

12. ECOLOGICAL INFORMATION

Ecotoxicity:

Data on Chlorpyrifos Technical:

Chlorpyrifos is highly toxic to aquatic organisms on an acute basis with an LC₅₀ or EC₅ <0.1 mg/l in the most sensitive species. Chlorpyrifos is highly toxic to birds on a dietary basis (LC₅₀ between 50 and 500 ppm) and moderately toxic to birds on an acute basis (LD₅₀ between 51 and 500 mg/kg).

Environmental Fate:

The major route of dissipation appears to be aerobic and anaerobic metabolism. Abiotic hydrolysis, photodegradation and volatilization do not appear to be significant routes of dissipation. Chlorpyrifos is moderately persistent in soils. Chlorpyrifos adsorbs strongly to soil particles and is not readily soluble in water. Degradation of chlorpyrifos in the soil is expected within days to weeks. Under aerobic soil conditions the half-life averages 30 to 60 days.

13. DISPOSAL CONSIDERATIONS

Waste Disposal Method:

Pesticide wastes are toxic. 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:

Nonrefillable Containers 5 Gallons or Less: Non-refillable 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: Non-refillable container. Do not reuse or refill this container. Offer for recycling if available. Triple rinse or pressure rinse container (or equivalent) promptly

MATERIAL SAFETY DATA SHEET NUFARM CHLORPYRIFOS SPC 2 INSECTICIDE

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 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.

Refillable containers larger than 5 gallons: Refillable container. Refill this container with pesticide only. Do not reuse this container for any other purpose. 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 and, if possible, spray all sides while adding water. If practical, 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. Then offer for recycling if available or puncture and dispose of in a sanitary landfill, or by incineration, or by other procedures allowed by state and local authorities.

Refillable Container: Refill this container with pesticide only. Do not reuse this container for any other purpose. Close all openings and replace all caps. Contact Nufarm's Customer Service Department at 1-800-345-3330 to arrange for return of the empty refillable container.

14. TRANSPORTATION INFORMATION

DOT

< 119 gallons per completed package

UN 3082, ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S., (NAPHTHALENE), 9, III, RQ, (CHLORPYRIFOS)

≥ 119 gallons and < 220 gallons per completed package

NA 1993, COMBUSTIBLE LIQUID, N.O.S. (NAPHTHALENE), 3, RQ, III, MARINE POLLUTANT, (CHLORPYRIFOS)

≥ 220 gallons per completed package

NA 1993, COMBUSTIBLE LIQUID, N.O.S. (NAPHTHALENE), III, RQ, MARINE POLLUTANT, (CHLORPYRIFOS)

IMDG

UN 3082, ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (CHLORPYRIFOS), 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, Delayed and Fire

Section 313 Toxic Chemical(s):

Naphthalene (CAS No. 91-20-3), < 7.0% by weight in product

1,2,4 Trimethylbenzene (CAS No. 95-63-6), <1.3% by weight in product

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

Chlorpyrifos (CAS No. 2921-88-2) 1 pound

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.

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 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 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.