FOR CHEMICAL EMERGENCY, SPILL, LEAK, FIRE, EXPOSURE OR ACCIDENT, CALL CHEMTREC - DAY OR NIGHT 1-800-424-9300

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

FORMULATED FOR:

LOVELAND PRODUCTS, INC.
P.O. Box 1286 • Greeley, CO 80632-1286

24-Hour Emergency Phone: 1-800-424-9300
Medical Emergencies: 1-866-944-8565
U.S. Coast Guard National Response Center: 1-800-424-8802

PRODUCT NAME: WARHAWK® CLEARFORM™
CHEMICAL NAME: Chlorpyrifos: O,O-diethyl-O-(3,5,6-trichloro-2-pyridinyl) phosphorothioate
CHEMICAL FAMILY: Organophosphate – Group 1B Insecticide
EPA REG. NO.: 34704-1077
MSDS Number: 001077-13-LPI **MSDS Revisions:** New **Date of Issue:** 09/27/13 **Supersedes:** New

2. HAZARDS IDENTIFICATION SUMMARY

KEEP OUT OF REACH OF CHILDREN – WARNING - AVISO – Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detaile (If you do not understand the label, find someone to explain it to you in detail.) May be fatal if swallowed • Harmful if absorbed through skin • Causes moderate eye irritation • Prolonged or frequently repeated skin contact may cause allergic reactions in some individuals. Avoid contact with skin eyes or clothing.

This product is a clear, golden amber liquid with petroleum-like odor.

3. COMPOSITION, INFORMATION ON INGREDIENTS

Chemical Ingredients:	Percentage by Weight:	CAS No.	TLV (Units)
Chlorpyrifos	44.90	2921-88-2	0.1 mg/m^3
Other Ingredients, including	55.10		
Aromatic Solvent, including		64742-94-5	not listed
Naphthalene		91-20-3	52 mg/m^3

This product is hazardous according to the OSHA Hazard Communication Standard (29 CFR 1910.1200)

4. FIRST AID MEASURES

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

NOTE TO PHYSICIAN: Chlorpyrifos is a cholinesterase inhibitor. Treat symptomatically. If exposed, plasma and red blood cell cholinesterase tests may indicate significance of exposure (baseline data are useful). Atropine, only by injection, is the preferable antidote. Oximes, such as 2-PAM/protopam, may be therapeutic if used early; however, use only in conjunction with atropine. In case of severe acute poisoning, use antidote immediately after establishing an open airway and respiration.

NOTE TO PHYSICIAN: Contains petroleum distillate - vomiting may cause aspiration pneumonia.

FOR A MEDICAL EMERGENCY INVOLVING THIS PRODUCT CALL: 1-866-944-8565. Have the product label or container with you when calling a poison control center or doctor, or going for treatment.

5. FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA: Water fog, foam, dry chemical, or carbon dioxide.

HAZARDOUS COMBUSTION PRODUCTS: In a fire situation, smoke may contain the original material in addition to combustion products of varying composition which may be toxic and/or irritating and may include and are not limited to: oxides of sulfur, Phosphorus compounds, oxides of nitrogen, Hydrogen chloride, and oxides of carbon.

SPECIAL FIRE FIGHTING PROCEDURES: Wear self-contained breathing apparatus with full protective clothing. Fight fire from upwind and keep all non-essential personnel out of area.

UNUSUAL FIRE AND EXPLOSION HAZARDS: If water is used to fight fire and cool the containers, contain run-off by diking to prevent contamination of water supplies.

6. ACCIDENTAL RELEASE MEASURES

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED:

For small spills, absorb with an absorbent material such as sand, vermiculite or other absorbent material. Place contaminated material in appropriate containers for proper disposal. For large spills: dike large spills using absorbent or impervious material such as clay or sand. Recover and contain as much free liquid as possible for reuse. Allow absorbed material to solidify, and scrape up for disposal. After removal, scrub the area with detergent and water and flush contaminated area thoroughly with water.

CAUTION: Keep spills and cleaning runoff out of municipal sewers and open bodies of water.

7. HANDLING AND STORAGE

HANDLING: 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 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 container in secured dry storage area. Prevent cross-contamination with other pesticides and fertilizers. Do not store above 100^{O}F / 37.8^{O}C for extended periods of time. Storage below 20^{O}F / -6.7^{O}C may result in the formation of crystals. If product crystallizes, store at 50^{O}F / 10^{O}C to 70^{O}F / 21^{O}C and agitate to redissolve crystals. Combustible. Do not use or store near heat or open flame. Do not contaminate water, food, or feed by storage or disposal.

Personal Protective Equipment (PPE): Mixers and loaders using a mechanical transfer loading system and applicators using aerial application equipment must wear: long-sleeved shirt and long pants, shoes and socks. In addition, **mixers and loaders**, using a mechanical transfer loading system must wear: chemical-resistant gloves, chemical-resistant apron, and a NIOSH-approved dust/mist filtering respirator with MSHA/NIOSH approval number prefix TC-21C or a NIOSH-approved respirator with any R, P, or HE filter. **All other mixers, loaders, applicators and other handlers must wear:** coveralls over short sleeved shirt and short pants, chemical-resistant gloves, chemical-resistant apron when mixing or loading or exposed to the concentrate, chemical-resistant footwear plus socks, chemical-resistant headgear for overhead exposure, a NIOSH-approved dust/mist filtering respirator with MSHA/NIOSH approval number prefix TC-21C or a NIOSH-approved respirator with any R, P, or HE filter. Discard clothing and other absorbent materials that have been drenched or heavily contaminated with this product's concentrate. Do not reuse them. Follow manufacturer's instructions for cleaning and maintaining PPE. If no instructions for washables, use detergent and hot water. Keep and wash PPE separately from other laundry. Refer to product label for additional information.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

ENGINEERING CONTROLS: Mixers and loaders supporting aerial applications must use a mechanical transfer system that meets the requirements listed in the Worker Protection Standard (WPS) for agricultural pesticides [40 CFR 170.240 (d) (4)] for dermal protection, and must: wear the personal protective equipment require above for mixers/loaders; wear protective eyewear if the system operates under pressure, and be provided and have immediately available for use in an emergency, such as broken package, spill, or equipment breakdown: coveralls, chemical resistant footwear and chemical resistant headgear if overhead exposure. Refer to product label for additional information.

RESPIRATORY PROTECTION: Not normally required; if vapors or mists become excessive, wear a NIOSH approved pesticide respirator with cartridges for pesticide vapors.

EYE PROTECTION: Chemical goggles or shielded safety glasses.

SKIN PROTECTION: Wear protective clothing: short-sleeved shirts and short pants, chemical-resistant footwear with socks. Wear chemical-resistant gloves, such as barrier laminate or Viton®.

	OSHA PEL 8 hr TWA	**ACGIH TLV-TWA**
Chlorpyrifos	not listed	0.1 mg/m^3
Naphthalene	50 mg/m^3	52 mg/m^3

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE, PHYSICAL STATE, COLOR AND ODOR: Clear, golden amber liquid with petroleum-like odor. **SOLUBILITY:** Emulsifiable
SPECIFIC GRAVITY (Water = 1): 1.091 g/ml **BULK DENSITY:** 9.10 lbs/gal. **pH:** 4.98
VAPOR PRESSURE: Not established **BOILING POINT:** 354^{O}F – 397^{O}F /179^{O} – 203^{O} C (solvent) **FREEZING POINT:** No data
PERCENT VOLATILE (by volume): Not established **EVAPORATION RATE:** Not established
FLASH POINT (°F/Test Method): 176^{O}F / 80^{O}C (TCC)
FLAMMABLE LIMITS (LFL & UFL): LFL: 0.8%; UFL: 5.9% (aromatic solvent)
Note: These physical data are typical values based on material tested but may vary from sample to sample. Typical values should not be construed as a guaranteed analysis of any specific lot or as specification items.

10. STABILITY AND REACTIVITY

STABILITY: Stable
CONDITIONS TO AVOID: Temperatures above 158^{O}F / 70^{O}C
INCOMPATIBILITY: Strong alkalis, amines, and oxidizers.

HAZARDOUS DECOMPOSITION PRODUCTS: May generate hydrogen chloride, ethyl sulfide, diethyl sulfide and oxides of nitrogen in a fire situation.

HAZARDOUS POLYMERIZATION: Will not occur.

11. TOXICOLOGICAL INFORMATION

Acute Oral LD_{50} (female rat): 175 mg/kg **Acute Dermal LD_{50} (rat):** 2,000 – 5,000 mg/kg
Eye Irritation (rabbit): Mild irritant **Skin Irritation (rabbit):** Moderate irritant
Inhalation LC_{50} (rat): > 2.04 mg/L (Aerosol - 4 hrs.) **Local Lymph Node Assay [LLNA] (mice):** Sensitizer
Carcinogenic Potential: ACGIH lists Chlorpyrifos as TLV-A4: Not Classifiable as a Human Carcinogen and Naphthalene as TLV-A4: Not Classifiable as a Human Carcinogen. EPA lists Naphthalene as EPA-CBD: Cannot Be Determined as to Human Carcinogenicity; IARC lists Naphthalene as IARC-2B: Possibly Carcinogenic to Humans. Naphthalene is listed as NTP-R: Reasonably Anticipated to Be a Human Carcinogen. Not listed in OSHA.

12. ECOLOGICAL INFORMATION

This pesticide is toxic to fish, aquatic invertebrates, small mammals and birds. Do not apply directly to water, or to areas where surface water is present or to intertidal areas below the mean high water mark. Drift and runoff from treated areas may be hazardous to aquatic organisms in water adjacent to treated areas. Do not contaminate water when disposing of equipment wash waters or rinsate.

This product is highly toxic to bees exposed to direct treatment or residues on blooming crops. Do not apply this product or allow it to drift to blooming crops or weeds if bees are actively visiting the treatment area.

Toxicity

Data for Component: Chlorpyrifos

Material is very highly toxic to aquatic organisms on an acute basis (LC_{50}/EC_{50} <0.1 mg/L in the most sensitive species). Material is highly toxic to birds on a dietary basis (LC_{50} between 50 and 500 ppm).

Fish Acute & Prolonged Toxicity

LC_{50}, Oncorhynchus mykiss (rainbow trout), 96 h: 0.003 mg/l

Aquatic Invertebrate Acute Toxicity

EC_{50}, Daphnia magna (Water flea), 48 h: 0.00068 mg/l

Aquatic Plant Toxicity

EC_{50}, Skeletonema costatum, Growth inhibition (cell density reduction), 96 h: 0.255 - 0.328 mg/l

Toxicity to Micro-organisms

EC_{50}; activated sludge: > 100 mg/l

Fish Chronic Toxicity Value (ChV)

Pimephales promelas (fathead minnow), 216 d, NOEC:0.000568 mg/l

Aquatic Invertebrates Chronic Toxicity Value

Daphnia magna (Water flea), number of offspring, NOEC: 0.000056 mg/l

Toxicity to Above Ground Organisms

Oral LD_{50}, Other: 122 mg/kg bodyweight.

Dietary LC_{50}, Colinus virginianus (Bobwhite quail): 423 mg/kg diet.

Oral LD_{50}, Apis mellifera (bees): 0.36 micrograms/bee

Contact LD_{50}, Apis mellifera (bees): 0.070 micrograms/bee

Toxicity to Soil Dwelling Organisms

LC_{50}, Eisenia fetida (earthworms), 14 d: 129 mg/kg

Fish Acute & Prolonged Toxicity

LC_{50}, Pimephales promelas (fathead minnow), flow-through test, 96 h: 7.7 mg/l

Aquatic Invertebrate Acute Toxicity

EC_{50}, Daphnia magna (Water flea), 48 h: 3.6 mg/l

Fish Acute & Prolonged Toxicity

LC_{50}, Oncorhynchus mykiss (rainbow trout), semi-static test, 96 h: 2.7 mg/l

Aquatic Invertebrate Acute Toxicity

EC_{50}, Daphnia magna (Water flea), static test, 48 h, immobilization: 4.0 mg/l

Aquatic Plant Toxicity

EbC_{50}, Pseudokirchneriella subcapitata (green algae), static test, biomass growth inhibition, 72 h: 2.6 mg/l

Aquatic Invertebrates Chronic Toxicity Value

Daphnia magna (Water flea), semi-static test, 21 d, number of offspring, NOEC: 0.35 mg/l, LOEC: 0.66 mg/l

Toxicity to Above Ground Organisms

Oral LD_{50}, redwing blackbird (Agelaius phoeniceus): > 98 mg/kg

Fish Acute & Prolonged Toxicity

LC_{50}, Oncorhynchus mykiss (rainbow trout), 96 h: 9.2 mg/l

Aquatic Invertebrate Acute Toxicity

LC_{50}, Daphnia magna (Water flea), 48 h, lethality: 14.3 mg/l

Aquatic Plant Toxicity

EbC_{50}, Pseudokirchneriella subcapitata (green algae), biomass growth inhibition, 72 h: 3.2 - 4.9 mg/l

Persistence and Degradability

Data for Component: Chlorpyrifos

Biodegradation under aerobic laboratory conditions is below detectable limits (BOD20 or BOD28/ThOD < 2.5%).

Stability in Water (1/2-life): 72 d

OECD Biodegradation Tests:

Biodegradation	Exposure Time	Method	10 Day Window
22 %	28 d	OECD 301D Test	fail

Theoretical Oxygen Demand: 3.17 mg/mg

Bioaccumulative potential

Data for Component: Chlorpyrifos

Bioaccumulation: Bioconcentration potential is moderate (BCF between 100 and 3000 or Log Pow between 3 and 5).

Partition coefficient, n-octanol/water (log Pow): 4.7 Estimated.

Bioconcentration Factor (BCF): 15 - 21; Fish; Measured

Mobility in soil

Data for Component: Chlorpyrifos

Mobility in soil: Expected to be relatively immobile in soil (Koc > 5000).

Partition coefficient, soil organic carbon/water (Koc): 8,151Henry's Law Constant (H): 6.6E-06 atm*m^3/mole Measured

Partition coefficient, soil organic carbon/water (Koc): 800 - 2,800 Estimated.

Henry's Law Constant (H): 1.15E-02 atm*m^3/mole; 25 °C Measured

Distribution in Environment: Mackay Level 1 Fugacity Model:

Air	Water.	Biota	Soil	Sediment
98.38 %	0.33 %	< 0.01 %	1.26 %	0.03 %

13. DISPOSAL CONSIDERATIONS

PESTICIDE DISPOSAL: Open dumping is prohibited. 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 the 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 DISPOSAL: Non-refillable container. Do not reuse this container to hold materials other than pesticides or dilute pesticides (rinsate). After emptying and cleaning, it may be allowable to temporarily hold rinsate or other pesticide-related materials in the container. Contact your state regulatory agency to determine allowable practices in your state. Once cleaned, some agricultural plastic pesticide containers can be taken to a container collection site or picked up for recycling. To find the nearest site, contact your chemical dealer or manufacturer, or contact The Agricultural Container Recycling Council (ACRC) at www.acrecycle.org. If not recycled, then puncture and dispose of in a sanitary landfill, or incineration, or if allowed by state and local authorities, by burning. If burned, stay out of smoke. Triple rinse or pressure rinse container (or equivalent) promptly after emptying.

For packages up to 5 gallons: 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 ¼ 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. 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 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.

For packages greater than 5 gallons and less than 56 gallons: Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank. Fill the container ¼ 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. 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 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.

For packages greater than 56 gallons: To clean the container before final disposal, empty the remaining contents from this container into application equipment or mix tank. Fill the container about 10 percent full with water. Agitate vigorously or recirculate water with the pump for 2 minutes. Pour or pump rinsate into application equipment or rinsate collection system. Repeat this rinsing procedure two more times.

For refillable containers: 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 mix tank. Fill the container about 10 percent full with water. Agitate vigorously or recirculate water with the pump for 2 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.

14. TRANSPORT INFORMATION

DOT Shipping Description: RQ UN3018, ORGANOPHOSPHORUS PESTICIDE, LIQUID, TOXIC (CHLORPYRIFOS), 6.1, III MARINE POLLUTANT ERG GUIDE 152

U.S. Surface Freight Classification: INSECTICIDES OR FUNGICIDES, INSECT OR ANIMAL REPELLENTS, NOI, OR VERMIN EXTERMINATORS, ANIMAL OR POULTRY, NOI; POISON (NMFC 102100; CLASS: 77.5)

15. REGULATORY INFORMATION

NFPA & HMIS Hazard Ratings:

NFPA		HMIS	
2	Health	2	Health
2	Flammability	2	Flammability
1	Instability	1	Reactivity
		G	PPE

0	Least
1	Slight
2	Moderate
3	High
4	Severe

SARA Hazard Notification/Reporting SARA Title III Hazard Category:

Immediate	Y	Fire	Y	Sudden Release of Pressure	N
Delayed	Y	Reactive	N		

Reportable Quantity (RQ) under U.S. CERCLA: Chlorpyrifos (CAS: 2921-88-2) 1 pound; Naphthalene (CAS: 91-20-3) 100 pounds
SARA, Title III, Section 313: Naphthalene (CAS: 91-20-3) 1.485%
RCRA Waste Code: U165 (Naphthalene).
CA Proposition 65: WARNING: This product contains chemicals known to the State of California to cause cancer or birth defects or other reproductive harm.

WARNING – This chemical is a pesticide product registered by the United States Environmental Protection Agency and is subject to certain labeling requirements under federal pesticide law. These requirements differ from the classification criteria and hazard information required for safety data sheets (SDS), and for workplace labels of non-pesticide chemicals.

16. OTHER INFORMATION

MSDS STATUS: New

PREPARED BY: Registrations and Regulatory Affairs **REVIEWED BY:** Environmental Health and Safety

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