

MATERIAL SAFETY DATA SHEET



Emergency Phone: 800-992-5994
Dow AgroSciences LLC
Indianapolis, IN 46268

LORSBAN* -4E INSECTICIDE (NAF 163)

Effective Date: 2/28/00
Product Code: 47602
MSDS: 005688

1. PRODUCT AND COMPANY IDENTIFICATION:

PRODUCT: Lorsban* -4E Insecticide (NAF-163)

COMPANY IDENTIFICATION:

Dow AgroSciences
9330 Zionsville Road
Indianapolis, IN 46268-1189

2. COMPOSITION/INFORMATION ON INGREDIENTS:

Chlorpyrifos: 0,0-diethyl- O-(3,5,6-trichloro-2- pyridinyl)phosphorothioate	CAS # 002921-88-2	44.9%
Inert Ingredients, total, including: Xylene Range Aromatic Solvent		55.1%
Trimethylbenzene	CAS # 064742-95-6	
Cumene	CAS # 000095-63-6	
Xylene	CAS # 000098-82-8	
Ethyltoluene	CAS # 001330-20-7	
	CAS # 025550-14-5	

This document is prepared pursuant to the OSHA Hazard Communication Standard (29 CFR 1910.1200). In addition, other substances not 'Hazardous' per this OSHA Standard may be listed. Where proprietary ingredient shows, the identity may be made available as provided in this standard.

3. HAZARDOUS IDENTIFICATIONS:

EMERGENCY OVERVIEW

Hazardous chemical. Red liquid with solvent-type odor. May cause eye irritation or corneal injury. Prolonged exposure may cause skin irritation. LD₅₀ for skin absorption in rabbits is >5000 mg/kg. Oral LD₅₀ for rats is 776 mg/kg (males) and 300 mg/kg (females). LC₅₀ for rats is 2.7 mg/L for 4 hours. Cholinesterase inhibitor. Toxic to aquatic organisms, birds, and fish.

EMERGENCY PHONE NUMBER: 800-992-5994

POTENTIAL HEALTH EFFECTS: This section includes possible adverse effects which could occur if this material is not handled in the recommended manner.

EYE: May cause moderate eye irritation and/or corneal injury. Vapors may irritate the eyes.

SKIN: Prolonged exposure may cause moderate skin irritation. A test in guinea pigs indicated that this product may have weak skin sensitization potential. However, experience in the manufacture and use of this product has not provided evidence for skin sensitizing properties. The product did not sensitize human subjects when tested at an end-use dilution. A single prolonged exposure is not likely to result in the material being absorbed through the skin in harmful amounts. The LD₅₀ for skin absorption in male rats is >5000 mg/kg.

INGESTION: Single dose oral toxicity is moderate. The oral LD₅₀ for rats is 776 mg/kg (males) and 300 mg/kg (females). Small amounts swallowed incidental to normal handling operations are not likely to cause injury; however, swallowing larger amounts may cause injury, even death. If aspirated (liquid enters the lung), may cause lung damage or death due to chemical pneumonia.

INHALATION: The aerosol LC₅₀ for rats is 2.7 mg/L for 4 hours. Excessive exposure may produce organophosphate-type cholinesterase inhibition. Excessive vapor concentrations are attainable and could be hazardous on single exposure. Excessive exposure to solvent may cause respiratory irritation and central nervous system depression. Signs and symptoms of central nervous system depression, are in order of increasing exposure, headache, dizziness, drowsiness, and incoordination.

SYSTEMIC (OTHER TARGET ORGAN EFFECTS):

Excessive exposure may produce organophosphate-type cholinesterase inhibition. Signs and symptoms of excessive exposure to chlorpyrifos may be headache, dizziness, incoordination, muscle twitching, tremors, nausea, abdominal cramps, diarrhea, sweating, pinpoint pupils, blurred vision, salivation, tearing, tightness in chest, excessive urination, convulsions. Chlorpyrifos produced mild adrenal effects when fed to rats, but only at doses that greatly exceeded any exposures that would be received during normal use of this product. Solvent has been reported to cause liver, kidney, and blood effects at high exposure levels. Xylene is reported to have caused hearing loss in laboratory animals upon exposure to high concentrations; such effects have not been reported in humans. For cumene, in animals, effects have been reported on the following organ: eye (cataract).

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CANCER INFORMATION: Chlorpyrifos did not cause cancer in laboratory animals. Xylene was not found to be carcinogenic in a National Toxicology Program bioassay in rats and mice.

TERATOLOGY (BIRTH DEFECTS): Chlorpyrifos did not cause birth defects in laboratory animals. Solvent was toxic to the fetus in laboratory animal tests, but only at doses that were toxic to the mothers. Very high concentrations of solvent (producing severe toxicity to adult animals) induced an increase in cleft palate in mice, which is a common developmental abnormality in mice and is associated with stress to the maternal animals. No malformations were induced at exposures less than those causing severe toxicity to the adult animals. This product contains low levels of xylene. Exaggerated doses of xylene given orally to pregnant mice resulted in an increase in cleft palate, a common developmental abnormality in mice. Inhalation exposure of pregnant animals to xylene resulted in toxicity to the fetus but did not cause any birth defects.

REPRODUCTIVE EFFECTS: Chlorpyrifos did not interfere with fertility in reproduction studies in laboratory animals. Some evidence of toxicity to the offspring occurred, but only at a dose high enough to produce significant toxicity to the parent animals. In a 3-generation reproduction study on the solvent, the only effects observed were at exposures that produced severe toxicity to the parent animals.

4. FIRST AID:

EYES: Irrigate with flowing water immediately and continuously for 15 minutes. Consult medical personnel.

SKIN: Immediately wash with plenty of soap and water. Remove contaminated clothing and shoes. Wash clothing before reuse. Destroy and dispose of contaminated shoes and other leather articles such as belts and watchbands.

INGESTION: Call a physician or poison control center immediately. Do not induce vomiting. Contains an aromatic petroleum solvent. Do not give anything by mouth to an unconscious person.

INHALATION: Remove to fresh air and if not breathing give artificial respiration, preferably mouth to mouth.

NOTE TO PHYSICIAN: Because rapid absorption may occur through the lungs if aspirated and cause systemic effects, the decision of whether to induce vomiting or not should be made by a physician. If lavage is performed, suggest endotracheal and/or esophageal control. Danger from lung aspiration must be weighed against toxicity when considering emptying the stomach. 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. Exposure may increase "myocardial irritability". Do not administer sympathomimetic drugs unless absolutely necessary. Supportive care. Treatment based on judgment of the physician in response to reactions of the patient.

5. FIRE FIGHTING MEASURES:

FLASH POINT: 106°F (41°C)
METHOD USED: TCC

FLAMMABLE LIMITS

LFL: 1%
UFL: 6% (xylene range aromatic solvent)

EXTINGUISHING MEDIA: Foam, CO₂, dry chemical

FIRE & EXPLOSION HAZARDS: Foam fire extinguishing system is preferred because uncontrolled water can spread possible contamination. Toxic, irritating gases may be formed under fire conditions. Rapid decomposition above 320-392°F (160-200°C) can occur. Violent rupture due to over-pressurization may occur at temperatures generated during a fire.

FIRE-FIGHTING EQUIPMENT: Use positive-pressure self-contained breathing apparatus and full protective clothing.

6. ACCIDENTAL RELEASE MEASURES:

ACTION TO TAKE FOR SPILLS/LEAKS: Absorb spills with inert absorbent material such as dry sand. Thoroughly wash body areas which come into contact with this product. Contain spill to keep out of sewers. Report large spills to Dow AgroSciences at 800-992-5994.

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7. HANDLING AND STORAGE:

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: Keep out of reach of children. Do not get in eyes, on skin or clothing. Avoid breathing vapor and spray mist. Users should wash hands before eating, drinking, using tobacco, or using the toilet. For handling relative to the end-use of this product, read the product label. Store in original container in a dry storage area. Do not store above 100°F for extended periods of time. Storage below 20°F may result in the formation of crystals. If product crystallizes, store at 50-70°F and agitate to re-dissolve crystals.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION:

These precautions are suggested for conditions where a potential for exposure exists. Emergency conditions may require additional precautions.

EXPOSURE GUIDELINE(S):

Chlorpyrifos: ACGIH TLV and OSHA PEL are 0.2 mg/M³, Skin. ACGIH classification is A4.

Aromatic 100 (xylene range aromatic solvent): none established.

Trimethylbenzene: ACGIH TLV and OSHA PEL are 25 ppm.

Cumene (isopropyl benzene): ACGIH TLV and OSHA PEL are 50 ppm.

Xylene: ACGIH TLV and OSHA PEL are 100 ppm TWA, 150 ppm STEL. ACGIH classification is A4.

Ethyltoluene: Dow AgroSciences Industrial Hygiene Guideline is 10 ppm.

PELs are in accord with those recommended by OSHA, as in the 1989 revision of PELs.

A 'skin' notation following the exposure guideline refers to the potential for dermal absorption of the material. It is intended to alert the reader that inhalation may not be the only route of exposure and that measures to minimize dermal exposures should be considered.

ENGINEERING CONTROLS: Provide general and/or local exhaust ventilation to control airborne levels below the exposure guidelines. Use only with adequate ventilation.

RECOMMENDATIONS FOR MANUFACTURING, COMMERCIAL BLENDING, AND PACKAGING WORKERS:

RESPIRATORY PROTECTION: Atmospheric levels should be maintained below the exposure guidelines. When respiratory protection is required, use a NIOSH approved air-purifying or positive-pressure supplied-air respirator depending on the potential airborne concentration. For emergency and other conditions where the exposure guideline may be greatly exceeded, use a NIOSH approved positive-pressure, self-contained breathing apparatus or positive-pressure airline with auxiliary self-contained air supply. In confined or poorly ventilated areas, use a NIOSH approved positive-pressure supplied-air respirator.

SKIN PROTECTION: Use protective clothing impervious to this material. Selection of specific items such as faceshield, gloves, boots, apron or full body suit will depend on operation. Remove contaminated clothing immediately, wash skin area with soap and water, and launder clothing before reuse. Items which cannot be decontaminated, such as shoes, belts and watchbands should be removed, destroyed and disposed of.

EYE PROTECTION: Use chemical goggles. If vapor exposure causes eye discomfort, use a NIOSH approved full-face respirator.

APPLICATORS AND ALL OTHER HANDLERS: Please refer to the product label for personal protective clothing and equipment.

9. PHYSICAL AND CHEMICAL PROPERTIES:

BOILING POINT: 290°F (143°C)(solvent)

VAPOR PRESSURE: <10 mmHg @ 25°C

VAPOR DENSITY: Not determined

SOLUBILITY IN WATER: Emulsifiable

SPECIFIC GRAVITY: 1.079

APPEARANCE: Red liquid

ODOR: Solvent-type odor

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10. STABILITY AND REACTIVITY:

STABILITY: (CONDITIONS TO AVOID) Avoid heating above 50°C (122°F). Chlorpyrifos undergoes exothermic decomposition at approximately 130°C (266°F) which can lead to higher temperatures and violent decomposition if generated heat is not removed. Contains petroleum derivative solvent - will burn.

INCOMPATIBILITY: (SPECIFIC MATERIALS TO AVOID)
None known.

HAZARDOUS DECOMPOSITION PRODUCTS: Under fire conditions, hydrogen chloride, ethyl sulfide, diethyl sulfide and nitrogen oxides can be formed.

HAZARDOUS POLYMERIZATION: Not known to occur.

11. TOXICOLOGICAL INFORMATION:

MUTAGENICITY (EFFECTS ON GENETIC MATERIAL): Results of in-vitro ("test tube") and animal mutagenicity tests on the aromatic solvent have been negative. Based on a majority of negative data and some equivocal or marginally positive results, chlorpyrifos is considered to have minimal mutagenic potential.

12. ECOLOGICAL INFORMATION:

ENVIRONMENTAL FATE:

MOVEMENT & PARTITIONING: Based on information for chlorpyrifos and components of Aromatic 100. Bioconcentration potential is moderate (BCF is between 100 and 3000 or Log Pow between 3 and 5).

DEGRADATION & PERSISTENCE: Based on information for chlorpyrifos.
The photolysis half-life in water is 3-4 weeks.
Tropospheric half-life is estimated to be 1.4 hours.
Degradation is expected in the soil environment within days to weeks.
Under aerobic soil conditions the half-life is generally 30-60 days.
Based on information for components of Aromatic 100. Biodegradation under aerobic static laboratory conditions is high (BOD 20 or BOD28/ThOD is >40%).

ECOTOXICOLOGY: Based on information for chlorpyrifos. Material is very highly toxic to aquatic organisms on an acute basis (LC₅₀/EC₅₀ <0.1 mg/L in most sensitive species).

Material is highly toxic to birds on a dietary basis (LC₅₀ between 50 and 500 ppm).

Material is moderately toxic to birds on an acute basis (LD₅₀ is between 51 and 500 mg/kg).

Based on information for Aromatic 100.

Material is moderately toxic to aquatic organisms on an acute basis (LC₅₀/EC₅₀ is between 1 and 10 mg/L in most sensitive species).

Material is practically non-toxic to birds on a dietary basis (LC₅₀ is >5000 ppm).

Material is practically non-toxic to birds on an acute basis (LD₅₀ is >2000 mg/kg).

13. DISPOSAL CONSIDERATIONS:

DISPOSAL METHOD: Do not contaminate food, feed, or water by storage or disposal. 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 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.

14. TRANSPORT INFORMATION:

For DOT regulatory information, if required, consult transportation regulations, product shipping papers, or contact your Dow AgroSciences representative.

15. REGULATORY INFORMATION:

NOTICE: The information herein is presented in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied, is given. Regulatory requirements are subject to change and may differ from one location to another; it is the buyer's responsibility to ensure that its activities comply with federal, state or provincial, and local laws. The following specific information is made for the purpose of complying with numerous federal, state or provincial, and local laws and regulations.

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U.S. REGULATIONS

SARA 313 INFORMATION: This product contains the following substances subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372:

CHEMICAL NAME CAS NUMBER CONCENTRATION

Xylene	001330-20-7	47.3%
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SARA HAZARD CATEGORY: This product has been reviewed according to the EPA "Hazard Categories" promulgated under Sections 311 and 312 of the Superfund Amendment and Reauthorization Act of 1986 (SARA Title III) and is considered, under applicable definitions, to meet the following categories:

An immediate health hazard
A delayed health hazard
A fire hazard

TOXIC SUBSTANCES CONTROL ACT (TSCA): All ingredients are on the TSCA inventory or are not required to be listed on the TSCA inventory.

STATE RIGHT-TO-KNOW: The following product components are cited on certain state lists as mentioned. Non-listed components may be shown in the composition section of the MSDS.

CHEMICAL NAME CAS NUMBER LIST

Xylene	001330-20-7	NJ1 NJ2 NJ3 PA1 PA3
Chlorpyrifos	002921-88-2	NJ3 PA1 PA3

NJ1=New Jersey Special Health Hazard Substance (present at greater than or equal to 0.1%).

NJ2=New Jersey Environmental Hazardous Substance (present at greater than or equal to 1.0%).

NJ3=New Jersey Workplace Hazardous Substance (present at greater than or equal to 1.0%).

PA1=Pennsylvania Hazardous Substance (present at greater than or equal to 1.0%).

PA3=Pennsylvania Environmental Hazardous Substance (present at greater than or equal to 1.0%).

OSHA HAZARD COMMUNICATION STANDARD: This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) RATINGS:

Category Rating

Health	2
Flammability	2
Reactivity	1

COMPREHENSIVE ENVIRONMENTAL RESPONSE COMPENSATION AND LIABILITY ACT (CERCLA, or SUPERFUND): This product contains the following substance(s) listed as "Hazardous Substances" under CERCLA which may require reporting of releases:

Chemical Name CAS Number RQ % in Product

Chlorpyrifos	002921-88-2	1	44.9%
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16. OTHER INFORMATION:

MSDS STATUS: Revised Sections: 3 & 8
Reference: DR-0352-3817
Replaces MSDS dated: 12/6/99
Document Code: D03-062-003
Replaces Document Code: D03-062-002

The Information Herein Is Given In Good Faith, But No Warranty, Express Or Implied, Is Made. Consult Dow AgroSciences For Further Information.