

Product Name: LORSBAN* Advanced Insecticide**Issue Date:** 05/05/2008**Print Date:** 02 Jul 2008

Dow AgroSciences LLC encourages and expects you to read and understand the entire (M)SDS, as there is important information throughout the document. We expect you to follow the precautions identified in this document unless your use conditions would necessitate other appropriate methods or actions.

1. Product and Company Identification

Product Name

LORSBAN* Advanced Insecticide

COMPANY IDENTIFICATION

Dow AgroSciences LLC
A Subsidiary of The Dow Chemical Company
9330 Zionsville Road
Indianapolis, IN 46268-1189
USA

Customer Information Number: 800-992-5994

EMERGENCY TELEPHONE NUMBER

24-Hour Emergency Contact: 800-992-5994

Local Emergency Contact: 800-992-5994

2. Hazards Identification

Emergency Overview

Color: White

Physical State: Liquid

Odor: Mild

OSHA Hazard Communication Standard

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

Potential Health Effects

Eye Contact: May cause moderate eye irritation. May cause slight corneal injury.

Skin Contact: Brief contact may cause moderate skin irritation with local redness.

Skin Absorption: Prolonged skin contact is unlikely to result in absorption of harmful amounts.

Skin Sensitization: Has demonstrated the potential for contact allergy in mice. Has caused allergic skin reactions when tested in mice.

Inhalation: Mist may cause irritation of upper respiratory tract (nose and throat) and lungs. Prolonged excessive exposure to mist may cause serious adverse effects, even death.

* Indicates a Trademark

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Ingestion: Moderate toxicity if swallowed. Small amounts swallowed incidentally as a result of normal handling operations are not likely to cause injury; however, swallowing larger amounts may cause serious injury, even death. Aspiration into the lungs may occur during ingestion or vomiting, causing lung damage or even death due to chemical pneumonia. Excessive exposure may produce organophosphate type cholinesterase inhibition.

Effects of Repeated Exposure: For the active ingredient(s): Chlorpyrifos. Excessive exposure may produce organophosphate type cholinesterase inhibition. Signs and symptoms of excessive exposure to active ingredient 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. In animals, effects have been reported on the following organs: Adrenal gland. Dose levels producing these effects were many times higher than any dose levels expected from exposure due to use. For the solvent(s): In animals, effects have been reported on the following organs: Kidney. Liver. Blood. For the minor component(s) In animals, effects have been reported on the following organs: Respiratory tract.

Cancer Information: For the minor component(s) Cumene. Has caused cancer in laboratory animals. However, the relevance of this to humans is unknown.

Birth Defects/Developmental Effects: For the active ingredient(s): Chlorpyrifos. Has been toxic to the fetus in lab animals at doses toxic to the mother. For the solvent(s): Has been toxic to the fetus in lab animals at doses toxic to the mother. Has caused birth defects in lab animals only at doses producing severe toxicity in the mother. For the minor component(s): Has been toxic to the fetus in lab animals at doses toxic to the mother. Did not cause birth defects in laboratory animals.

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. For the solvent(s): In laboratory animal studies, effects on reproduction have been seen only at doses that produced significant toxicity to the parent animals. Reproductive effects seen in female animals are believed to be due to altered nutritional states resulting from extremely high doses of glycerine given in the diet. Similar effects have been seen in animals fed synthetic diets.

3. Composition Information

Component	CAS #	Amount
Chlorpyrifos	2921-88-2	40.2 %
Solvent naphtha (petroleum), light aromatic	64742-95-6	20.0 %
1,2,4-Trimethylbenzene	95-63-6	6.0 %
Glycerol	56-81-5	2.5 %
1,3,5-Trimethylbenzene	108-67-8	1.6 %
Cumene	98-82-8	0.8 %
Xylene	1330-20-7	0.2 %
Balance		28.7 %

4. First-aid measures

Eye Contact: Hold eyes open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eyes. Call a poison control center or doctor for treatment advice.

Skin Contact: Take off contaminated clothing. Wash skin with soap and plenty of water for 15-20 minutes. Call a poison control center or doctor for treatment advice. Wash clothing before reuse. Shoes and other leather items which cannot be decontaminated should be disposed of properly.

Inhalation: Move person to fresh air. If person is not breathing, call an emergency responder or ambulance, then give artificial respiration; if by mouth to mouth use rescuer protection (pocket mask etc). Call a poison control center or doctor for treatment advice. If breathing is difficult, oxygen should be administered by qualified personnel.

Ingestion: 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.

Notes to Physician: Maintain adequate ventilation and oxygenation of the patient. If lavage is performed, suggest endotracheal and/or esophageal control. Danger from lung aspiration must be weighed against toxicity when considering emptying the stomach. The decision of whether to induce vomiting or not should be made by a physician. This material 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. Attempt seizure control with diazepam 5-10 mg (adults) intravenous over 2-3 minutes. Repeat every 5-10 minutes as needed. Monitor for hypotension, respiratory depression, and need for intubation. Consider second agent if seizures persist after 30 mg. If seizures persist or recur administer phenobarbital 600-1200 mg (adults) intravenous diluted in 60 ml 0.9% saline given at 25-50 mg/minute. Evaluate for hypoxia, dysrhythmia, electrolyte disturbance, hypoglycemia (treat adults with dextrose 100 mg intravenous). Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient. Have the Safety Data Sheet, and if available, the product container or label with you when calling a poison control center or doctor, or going for treatment.

5. Fire Fighting Measures

Extinguishing Media: Water fog or fine spray. Dry chemical fire extinguishers. Carbon dioxide fire extinguishers. Foam. Alcohol resistant foams (ATC type) are preferred. General purpose synthetic foams (including AFFF) or protein foams may function, but will be less effective.

Fire Fighting Procedures: Keep people away. Isolate fire and deny unnecessary entry. Use water spray to cool fire exposed containers and fire affected zone until fire is out and danger of reignition has passed. Fight fire from protected location or safe distance. Consider the use of unmanned hose holders or monitor nozzles. Immediately withdraw all personnel from the area in case of rising sound from venting safety device or discoloration of the container. Burning liquids may be extinguished by dilution with water. Do not use direct water stream. May spread fire. Move container from fire area if this is possible without hazard. Burning liquids may be moved by flushing with water to protect personnel and minimize property damage. Contain fire water run-off if possible. Fire water run-off, if not contained, may cause environmental damage. Review the "Accidental Release Measures" and the "Ecological Information" sections of this (M)SDS.

Special Protective Equipment for Firefighters: Wear positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, trousers, boots, and gloves). Avoid contact with this material during fire fighting operations. If contact is likely, change to full chemical resistant fire fighting clothing with self-contained breathing apparatus. If this is not available, wear full chemical resistant clothing with self-contained breathing apparatus and fight fire from a remote location. For protective equipment in post-fire or non-fire clean-up situations, refer to the relevant sections.

Unusual Fire and Explosion Hazards: Container may rupture from gas generation in a fire situation. Violent steam generation or eruption may occur upon application of direct water stream to hot liquids. Dense smoke is produced when product burns.

Hazardous Combustion Products: During a fire, smoke may contain the original material in addition to combustion products of varying composition which may be toxic and/or irritating. Combustion products may include and are not limited to: Sulfur oxides. Phosphorus oxides. Nitrogen oxides. Hydrogen chloride. Carbon monoxide. Carbon dioxide.

6. Accidental Release Measures

Steps to be Taken if Material is Released or Spilled: Contain spilled material if possible. Small spills: Absorb with materials such as: Clay. Dirt. Sand. Sweep up. Collect in suitable and properly labeled containers. Large spills: Contact Dow AgroSciences for clean-up assistance.

Personal Precautions: Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection.

Environmental Precautions: Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information.

7. Handling and Storage

Handling

General Handling: Keep out of reach of children. Do not swallow. Avoid breathing vapor or mist. Avoid contact with eyes, skin, and clothing. Use with adequate ventilation. Wash thoroughly after handling.

Other Precautions: Containers, even those that have been emptied, can contain vapors. Do not cut, drill, grind, weld, or perform similar operations on or near empty containers.

Storage

Store in a dry place. Store in original container. Keep container tightly closed when not in use. Do not store near food, foodstuffs, drugs or potable water supplies.

8. Exposure Controls / Personal Protection

Exposure Limits

Component	List	Type	Value
Chlorpyrifos	ACGIH	TWA Inhalable fraction and vapor.	0.1 mg/m ³ SKIN, BEI
1,3,5-Trimethylbenzene	ACGIH	TWA	25 ppm
1,2,4-Trimethylbenzene	ACGIH	TWA	25 ppm
Glycerol	ACGIH	TWA Mist.	10 mg/m ³
	OSHA Table Z-1	PEL Respirable fraction.	5 mg/m ³
	OSHA Table Z-1	PEL Total dust.	15 mg/m ³
	TX ESL	ST ESL Respirable.	50 ug/m ³ 31 hour
Cumene	TX ESL	AN ESL Respirable.	5 ug/m ³
	ACGIH	TWA	50 ppm
Xylene	OSHA Table Z-1	PEL	245 mg/m ³ 50 ppm SKIN
	ACGIH	TWA	100 ppm BEI
Xylene	ACGIH	STEL	150 ppm BEI
	OSHA Table Z-1	PEL	435 mg/m ³ 100 ppm

RECOMMENDATIONS IN THIS SECTION ARE FOR MANUFACTURING, COMMERCIAL BLENDING AND PACKAGING WORKERS. APPLICATORS AND HANDLERS SHOULD SEE THE PRODUCT LABEL FOR PROPER PERSONAL PROTECTIVE EQUIPMENT AND CLOTHING.

A "skin" notation following the exposure guideline refers to the potential for dermal absorption of the material including mucous membranes and the eyes either by contact with vapors or by direct skin contact.

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.

A BEI notation following the exposure guideline refers to a guidance value for assessing biological monitoring results as an indicator of the uptake of a substance from all routes of exposures.

Personal Protection

Eye/Face Protection: Use chemical goggles.

Skin Protection: Use protective clothing chemically resistant to this material. Selection of specific items such as face shield, boots, apron, or full body suit will depend on the task. Remove contaminated clothing immediately, wash skin area with soap and water, and launder clothing before reuse or dispose of properly. Items which cannot be decontaminated, such as shoes, belts and watchbands, should be removed and disposed of properly.

Hand protection: Use gloves chemically resistant to this material. Examples of preferred glove barrier materials include: Chlorinated polyethylene. Neoprene. Nitrile/butadiene rubber ("nitrile" or "NBR"). Polyethylene. Ethyl vinyl alcohol laminate ("EVAL"). Examples of acceptable glove barrier materials include: Butyl rubber. Natural rubber ("latex"). Polyvinyl chloride ("PVC" or "vinyl"). Viton. NOTICE: The selection of a specific glove for a particular application and duration of use in a workplace should also take into account all relevant workplace factors such as, but not limited to: Other chemicals which may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), potential body reactions to glove materials, as well as the instructions/specifications provided by the glove supplier.

Respiratory Protection: Respiratory protection should be worn when there is a potential to exceed the exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, use an approved respirator. Selection of air-purifying or positive-pressure supplied-air will depend on the specific operation and the potential airborne concentration of the material. For emergency conditions, use an approved positive-pressure self-contained breathing apparatus. In confined or poorly ventilated areas, use an approved self-contained breathing apparatus or positive pressure air line with auxiliary self-contained air supply.

Ingestion: Avoid ingestion of even very small amounts; do not consume or store food or tobacco in the work area; wash hands and face before smoking or eating.

Engineering Controls

Ventilation: Use engineering controls to maintain airborne level below exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, use only with adequate ventilation. Local exhaust ventilation may be necessary for some operations.

9. Physical and Chemical Properties

Physical State	Liquid
Color	White
Odor	Mild
Flash Point - Closed Cup	> 100 °C (> 212 °F) <i>Pensky-Martens Closed Cup ASTM D 93</i>
Flammable Limits In Air	Lower: No test data available Upper: No test data available
Autoignition Temperature	No test data available
Vapor Pressure	
Boiling Point (760 mmHg)	No test data available.
Vapor Density (air = 1)	No test data available
Specific Gravity (H₂O = 1)	No test data available
Liquid Density	1.12 g/cm ³ @ 20 °C <i>Calculated</i>
Freezing Point	No test data available
Melting Point	No test data available
Solubility in Water (by weight)	No test data available
pH	4.4 (@ 1 %) <i>pH Electrode</i>

10. Stability and Reactivity

Stability/Instability

Stable under recommended storage conditions. See Storage, Section 7.

Conditions to Avoid: Active ingredient decomposes at elevated temperatures. Generation of gas during decomposition can cause pressure in closed systems.

Incompatible Materials: Avoid contact with: Acids. Oxidizers. Reducing agents.

Hazardous Polymerization

Will not occur.

Thermal Decomposition

Decomposition products depend upon temperature, air supply and the presence of other materials. Decomposition products can include and are not limited to: Carbon monoxide. Carbon dioxide. Hydrogen chloride. Nitrogen oxides. Phosphorus oxides. Sulfur oxides. Toxic gases are released during decomposition.

11. Toxicological Information

Acute Toxicity

Ingestion

LD50, Rat, female 494.7 mg/kg

Skin Absorption

LD50, Rat, male and female > 5,000 mg/kg

Inhalation

Maximum attainable concentration. LC50, 4 h, Aerosol, Rat, male and female > 0.48 mg/l

Sensitization

Skin

Has demonstrated the potential for contact allergy in mice. Has caused allergic skin reactions when tested in mice.

Repeated Dose Toxicity

For the active ingredient(s): Chlorpyrifos. Excessive exposure may produce organophosphate type cholinesterase inhibition. Signs and symptoms of excessive exposure to active ingredient 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. In animals, effects have been reported on the following organs: Adrenal gland. Dose levels producing these effects were many times higher than any dose levels expected from exposure due to use. For the solvent(s): In animals, effects have been reported on the following organs: Kidney. Liver. Blood. For the minor component(s) In animals, effects have been reported on the following organs: Respiratory tract.

Chronic Toxicity and Carcinogenicity

Active ingredient did not cause cancer in laboratory animals. For the minor component(s) Cumene. Has caused cancer in laboratory animals. However, the relevance of this to humans is unknown. For the minor component(s): Xylene was not found to be carcinogenic in a National Toxicology Program bioassay in rats and mice.

Developmental Toxicity

For the active ingredient(s): Chlorpyrifos. Has been toxic to the fetus in lab animals at doses toxic to the mother. For the active ingredient(s): Chlorpyrifos. Did not cause birth defects in laboratory animals. For the solvent(s): Has been toxic to the fetus in lab animals at doses toxic to the mother. Has caused birth defects in lab animals only at doses producing severe toxicity in the mother. For the minor component(s): Has been toxic to the fetus in lab animals at doses toxic to the mother. Did not cause birth defects in laboratory animals.

Reproductive Toxicity

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. For the solvent(s): In laboratory animal studies, effects on reproduction have been seen only at doses that produced significant toxicity to the parent animals. Reproductive effects seen in female animals are believed to be due to altered nutritional states resulting from extremely high doses of glycerine given in the diet. Similar effects have been seen in animals fed synthetic diets.

Genetic Toxicology

For the active ingredient(s): Chlorpyrifos. No relevant information found. For the component(s) tested: In vitro genetic toxicity studies were negative. For the active ingredient(s): Chlorpyrifos. Based on a majority of negative data and some equivocal or marginally positive results, active ingredient is considered to have minimal genetic toxicity potential. For the component(s) tested: Animal genetic toxicity studies were negative.

12. Ecological Information

ENVIRONMENTAL FATE

Data for Component: **Chlorpyrifos**

Movement & Partitioning

Bioconcentration potential is moderate (BCF between 100 and 3000 or Log Pow between 3 and 5). Expected to be relatively immobile in soil (Koc > 5000).

Henry's Law Constant (H): 6.6E-6 atm*m3/mole Measured

Partition coefficient, n-octanol/water (log Pow): 4.96 Measured

Partition coefficient, soil organic carbon/water (Koc): 1,259 - 12,589 Measured

Bioconcentration Factor (BCF): 180; invertebrate; Measured
100 - 1,673; fish; Measured

Persistence and Degradability

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

Indirect Photodegradation with OH Radicals

Rate Constant	Atmospheric Half-life	Method
91.6678E-12 cm3/s	1.4 h	Estimated

Stability in Water (1/2-life):

7 - 14 d

Biological oxygen demand (BOD):

BOD 5	BOD 10	BOD 20	BOD 28
0 %			

Data for Component: **Solvent naphtha (petroleum), light aromatic**

Movement & Partitioning

For the major component(s): Bioconcentration potential is moderate (BCF between 100 and 3000 or Log Pow between 3 and 5). Potential for mobility in soil is low (Koc between 500 and 2000). For the minor component(s): Bioconcentration potential is low (BCF < 100 or Log Pow < 3).

Persistence and Degradability

For the major component(s): Biodegradation under aerobic static laboratory conditions is high (BOD20 or BOD28/ThOD > 40%). For some component(s): Biodegradation under aerobic static laboratory conditions is low (BOD20 or BOD28/ThOD between 2.5 and 10%).

Data for Component: **1,2,4-Trimethylbenzene**

Movement & Partitioning

Bioconcentration potential is moderate (BCF between 100 and 3000 or Log Pow between 3 and 5). Potential for mobility in soil is low (Koc between 500 and 2000).

Henry's Law Constant (H): 6.16E-03 atm*m3/mole; 25 °C Measured

Partition coefficient, n-octanol/water (log Pow): 3.63 Measured

Partition coefficient, soil organic carbon/water (Koc): 720 Estimated

Bioconcentration Factor (BCF): 33 - 275; common carp (Cyprinus carpio); Measured

Persistence and Degradability

Material is expected to biodegrade only very slowly (in the environment). Fails to pass OECD/EEC tests for ready biodegradability.

Indirect Photodegradation with OH Radicals

Rate Constant	Atmospheric Half-life	Method
16.70E-12 cm3/s	0.641 d	Estimated

OECD Biodegradation Tests:

Biodegradation	Exposure Time	Method
4 - 18 %	28 d	OECD 301C Test

Theoretical Oxygen Demand: 3.19 mg/mg

Data for Component: Glycerol**Movement & Partitioning**

Bioconcentration potential is low (BCF less than 100 or log Pow less than 3). Potential for mobility in soil is very high (Koc between 0 and 50). Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process.

Henry's Law Constant (H): 1.73E-8 atm*m3/mole; 25 °C Measured

Partition coefficient, n-octanol/water (log Pow): -1.76 Measured

Partition coefficient, soil organic carbon/water (Koc): 1 Estimated

Persistence and Degradability

Material is readily biodegradable. Passes OECD test(s) for ready biodegradability.

OECD Biodegradation Tests:

Biodegradation	Exposure Time	Method
63 %	14 d	OECD 301C Test

Theoretical Oxygen Demand: 1.22 mg/mg

Data for Component: 1,3,5-Trimethylbenzene**Movement & Partitioning**

Bioconcentration potential is moderate (BCF between 100 and 3000 or Log Pow between 3 and 5). Potential for mobility in soil is low (Koc between 500 and 2000).

Henry's Law Constant (H): 1.97E-2 atm*m3/mole; 25 °C Estimated

Partition coefficient, n-octanol/water (log Pow): 3.42 Measured

Partition coefficient, soil organic carbon/water (Koc): 700 Estimated

Bioconcentration Factor (BCF): 23 - 342; fish; Measured

Persistence and Degradability

Material is not readily biodegradable according to OECD/EC guidelines. Biodegradation rate may increase in soil and/or water with acclimation.

Indirect Photodegradation with OH Radicals

Rate Constant	Atmospheric Half-life	Method
3.51E-11 cm3/s	3.7 h	Estimated

OECD Biodegradation Tests:

Biodegradation	Exposure Time	Method
0 %	28 d	OECD 301C Test

Biological oxygen demand (BOD):

BOD 5	BOD 10	BOD 20	BOD 28
3.1 %			

Theoretical Oxygen Demand: 3.19 mg/mg

Data for Component: Cumene**Movement & Partitioning**

Bioconcentration potential is low (BCF less than 100 or log Pow less than 3). Potential for mobility in soil is low (Koc between 500 and 2000).

Henry's Law Constant (H): 1.15E-2 atm*m3/mole; 25 °C Measured

Partition coefficient, n-octanol/water (log Pow): 3.4 - 3.7 Measured

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

Bioconcentration Factor (BCF): 35.5; fish; Measured

Persistence and Degradability

Material is readily biodegradable. Passes OECD test(s) for ready biodegradability.

Indirect Photodegradation with OH Radicals

Rate Constant	Atmospheric Half-life	Method
6.90E-12 cm3/s	1.55 d	Estimated

OECD Biodegradation Tests:

Biodegradation	Exposure Time	Method
86 %	28 d	OECD 301D Test

Biological oxygen demand (BOD):

BOD 5	BOD 10	BOD 20	BOD 28
37 %	44 %	48 %	

Theoretical Oxygen Demand: 3.20 mg/mg

Data for Component: Xylene**Movement & Partitioning**

Bioconcentration potential is low (BCF less than 100 or log Pow less than 3). Potential for mobility in soil is medium (Koc between 150 and 500).

Henry's Law Constant (H): 7.45E-3 atm*m3/mole; 25 °C Estimated

Partition coefficient, n-octanol/water (log Pow): 3.12 Measured

Partition coefficient, soil organic carbon/water (Koc): 443 Estimated

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

Persistence and Degradability

Material is expected to be readily biodegradable.

Indirect Photodegradation with OH Radicals

Rate Constant	Atmospheric Half-life	Method
6.5E-12 cm3/s	19.7 h	Estimated

Biological oxygen demand (BOD):

BOD 5	BOD 10	BOD 20	BOD 28
37 %	58 %	72 %	

Theoretical Oxygen Demand: 3.17 mg/mg

ECOTOXICITYData for Component: 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 between 51 and 500 mg/kg).

Fish Acute & Prolonged Toxicity

LC50, bluegill (*Lepomis macrochirus*): 0.0017 - 0.0042 mg/l

LC50, rainbow trout (*Oncorhynchus mykiss*), 96 h: 0.0030 - 0.0085 mg/l

LC50, fathead minnow (*Pimephales promelas*), static, 96 h: 0.1 mg/l

Aquatic Invertebrate Acute Toxicity

EC50, water flea *Daphnia magna*, 48 h: 0.00068 mg/l

Aquatic Plant Toxicity

EC50, alga *Scenedesmus* sp., biomass growth inhibition, 96 h: 0.48 mg/l

EC50, diatom *Skeletonema costatum*, Growth inhibition (cell density reduction), 96 h: 0.255 - 0.328 mg/l

Toxicity to Micro-organisms

EC50; activated sludge, respiration inhibition: > 100 mg/l

Toxicity to Non-mammalian Terrestrial Species

dietary LC50, bobwhite (*Colinus virginianus*): 423 ppm

dietary LC50, mallard (*Anas platyrhynchos*): 591 ppm

oral LD50, Honey bee (*Apis mellifera*): 0.36 micrograms/bee

contact LD50, Honey bee (*Apis mellifera*): 0.07 micrograms/bee

Toxicity to Soil Dwelling Organisms

LC50, Earthworm *Eisenia foetida*, adult, 14 d: 0.214 mg/kg

Data for Component: Solvent naphtha (petroleum), light aromatic

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

Fish Acute & Prolonged Toxicity

LC50, rainbow trout (*Oncorhynchus mykiss*), 96 h: 9.22 mg/l

Aquatic Invertebrate Acute Toxicity

LC50, saltwater mysid *Mysidopsis bahia*, 96 h: 2.0 mg/l

Toxicity to Non-mammalian Terrestrial Species

dietary LC50, bobwhite (*Colinus virginianus*): > 6,500 ppm

oral LD50, bobwhite (*Colinus virginianus*): > 2,250 mg/kg

Data for Component: 1,2,4-Trimethylbenzene

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

Fish Acute & Prolonged Toxicity

LC50, fathead minnow (*Pimephales promelas*), flow-through, 96 h: 7.7 mg/l

LC50, rainbow trout (*Oncorhynchus mykiss*), static, 24 h: 5 mg/l

Aquatic Invertebrate Acute Toxicity

EC50, water flea *Daphnia magna*, 48 h: 3.6 mg/l

LC50, grass shrimp (*Palaemonetes pugio*), 96 h, survival: 5.4 mg/l

Data for Component: Glycerol

Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50 >100 mg/L in the most sensitive species tested).

Fish Acute & Prolonged Toxicity

LC50, fathead minnow (*Pimephales promelas*), static, 96 h: 44,000 mg/l

Aquatic Invertebrate Acute Toxicity

LC50, water flea *Daphnia magna*, 24 h: > 10,000 mg/l

Toxicity to Micro-organisms

EC50, OECD 209 Test; activated sludge, respiration inhibition, 3 h: > 1,000 mg/l

Data for Component: 1,3,5-Trimethylbenzene

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

Fish Acute & Prolonged Toxicity

LC50, Japanese medaka (*Oryzias latipes*): 8.6 mg/l

LC50, goldfish (*Carassius auratus*), flow-through, 96 h: 12.52 mg/l

Aquatic Invertebrate Acute Toxicity

LC50, water flea *Daphnia magna*: 50 mg/l

EC50, water flea *Daphnia magna*, static, 24 h, immobilization: 50 mg/l

Aquatic Plant Toxicity

EC50, alga *Scenedesmus* sp., biomass growth inhibition, 48 h: 25 mg/l

Data for Component: Cumene

Material is highly toxic to aquatic organisms on an acute basis (LC50/EC50 between 0.1 and 1 mg/L in the most sensitive species tested).

Material is toxic to aquatic organisms (LC50/EC50/IC50 between 1 and 10 mg/L in most sensitive species).

Fish Acute & Prolonged Toxicity

LC50, rainbow trout (*Oncorhynchus mykiss*), 96 h: 3.6 mg/l

Aquatic Invertebrate Acute Toxicity

EC50, water flea *Daphnia magna*, 48 h, immobilization: 4.0 mg/l

LC50, water flea *Daphnia magna*, 48 h: 0.6 mg/l

Aquatic Plant Toxicity

EC50, green alga *Selenastrum capricornutum*, biomass growth inhibition: 2.6 mg/l

Toxicity to Non-mammalian Terrestrial Species

oral LD50, redwing blackbird (*Agelaius phoeniceus*): > 98 mg/kg

Data for Component: Xylene

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

Fish Acute & Prolonged Toxicity

LC50, rainbow trout (*Oncorhynchus mykiss*), 96 h: 9.2 mg/l

Aquatic Invertebrate Acute Toxicity

LC50, water flea *Daphnia magna*, 48 h: 14.3 mg/l

Aquatic Plant Toxicity

EC50, green alga *Selenastrum capricornutum*, biomass growth inhibition, 72 h: 3.2 - 4.9 mg/l

13. Disposal Considerations

If wastes and/or containers cannot be disposed of according to the product label directions, disposal of this material must be in accordance with your local or area regulatory authorities. This information presented below only applies to the material as supplied. The identification based on characteristic(s)

or listing may not apply if the material has been used or otherwise contaminated. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste identification and disposal methods in compliance with applicable regulations. If the material as supplied becomes a waste, follow all applicable regional, national and local laws.

14. Transport Information

DOT Non-Bulk

Proper Shipping Name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.

Technical Name: CHLORPYRIFOS

Hazard Class: 9 **ID Number:** UN3082 **Packing Group:** PG III

DOT Bulk

Proper Shipping Name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.

Technical Name: CHLORPYRIFOS

Hazard Class: 9 **ID Number:** UN3082 **Packing Group:** PG III

IMDG

Proper Shipping Name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.

Technical Name: CHLORPYRIFOS

Hazard Class: 9 **ID Number:** UN3082 **Packing Group:** PG III

EMS Number: F-A,S-F

Marine pollutant.: Yes

ICAO/IATA

Proper Shipping Name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.

Technical Name: CHLORPYRIFOS

Hazard Class: 9 **ID Number:** UN3082 **Packing Group:** PG III

Cargo Packing Instruction: 914

Passenger Packing Instruction: 914

Additional Information

Reportable quantity: 2 lb – CHLORPYRIFOS

MARINE POLLUTANT (CHLORPYRIFOS)

This information is not intended to convey all specific regulatory or operational requirements/information relating to this product. Additional transportation system information can be obtained through an authorized sales or customer service representative. It is the responsibility of the transporting organization to follow all applicable laws, regulations and rules relating to the transportation of the material.

15. Regulatory Information

OSHA Hazard Communication Standard

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

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Sections 311 and 312

Immediate (Acute) Health Hazard	Yes
Delayed (Chronic) Health Hazard	Yes
Fire Hazard	No
Reactive Hazard	No
Sudden Release of Pressure Hazard	No

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Section 313

This product contains the following substances which are subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and which are listed in 40 CFR 372.

Component	CAS #	Amount
1,2,4-Trimethylbenzene	95-63-6	6.0%

Pennsylvania (Worker and Community Right-To-Know Act): Pennsylvania Hazardous Substances List and/or Pennsylvania Environmental Hazardous Substance List:

The following product components are cited in the Pennsylvania Hazardous Substance List and/or the Pennsylvania Environmental Substance List, and are present at levels which require reporting.

Component	CAS #	Amount
Chlorpyrifos	2921-88-2	40.6%
1,2,4-Trimethylbenzene	95-63-6	6.0%
Glycerol	56-81-5	2.5%
1,3,5-Trimethylbenzene	108-67-8	1.6%
Cumene	98-82-8	0.8%

Pennsylvania (Worker and Community Right-To-Know Act): Pennsylvania Special Hazardous Substances List:

To the best of our knowledge, this product does not contain chemicals at levels which require reporting under this statute.

Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) Section 103

This product contains the following substances which are subject to CERCLA Section 103 reporting requirements and which are listed in 40 CFR 302.4.

Component	CAS #	Amount
Chlorpyrifos	2921-88-2	40.6%
Cumene	98-82-8	0.8%
Xylene	1330-20-7	0.2%

California Proposition 65 (Safe Drinking Water and Toxic Enforcement Act of 1986)

This product contains no listed substances known to the State of California to cause cancer, birth defects or other reproductive harm, at levels which would require a warning under the statute.

Toxic Substances Control Act (TSCA)

All components of this product are on the TSCA Inventory or are exempt from TSCA Inventory requirements under 40 CFR 720.30

CEPA - Domestic Substances List (DSL)**16. Other Information****Hazard Rating System**

NFPA	Health	Fire	Reactivity
	3	2	0

Revision

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DAS Code: GF-2153

Most recent revision(s) are noted by the bold, double bars in left-hand margin throughout this document.

Legend

N/A	Not available
W/W	Weight/Weight
OEL	Occupational Exposure Limit
STEL	Short Term Exposure Limit
TWA	Time Weighted Average
ACGIH	American Conference of Governmental Industrial Hygienists, Inc.
DOW IHG	Dow Industrial Hygiene Guideline
WEEL	Workplace Environmental Exposure Level
HAZ_DES	Hazard Designation
Action Level	A value set by OSHA that is lower than the PEL which will trigger the need for activities such as exposure monitoring and medical surveillance if exceeded.

Dow AgroSciences LLC urges each customer or recipient of this (M)SDS to study it carefully and consult appropriate expertise, as necessary or appropriate, to become aware of and understand the data contained in this (M)SDS and any hazards associated with the product. The information herein is provided 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 between various locations. It is the buyer's/user's responsibility to ensure that his activities comply with all federal, state, provincial or local laws. The information presented here pertains only to the product as shipped. Since conditions for use of the product are not under the control of the manufacturer, it is the buyer's/user's duty to determine the conditions necessary for the safe use of this product. Due to the proliferation of sources for information such as manufacturer-specific (M)SDSs, we are not and cannot be responsible for (M)SDSs obtained from any source other than ourselves. If you have obtained an (M)SDS from another source or if you are not sure that the (M)SDS you have is current, please contact us for the most current version.