



SHANGHAI MINGDOU AGROCHEMICAL CO., LTD

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## MATERIAL SAFETY DATA SHEET OF CHLORPYRIFOS 480 G/L EC

### 1. IDENTIFICATION OF THE CHEMICAL PRODUCT AND COMPANY

**Supplier:** SHANGHAI MINGDOU AGROCHEMICAL CO., LTD

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**Product name:** Chlorpyrifos 480 g/l EC

**Product use:** Chlorpyrifos 480 g/l EC is an emulsifiable concentrate formulation of the active ingredient Chlorpyrifos. It used for the control and prevention of termites infestation.

### 2. COMPOSITION/INFORMATION ON INGREDIENTS

**Formulation Type:** Emulsifiable concentrate

**Active Ingredients:** Chlorpyrifos

**Chemical Abstracts name:** *O,O*-diethyl *O*-(3,5,6-trichloro-2-pyridinyl) phosphorothioate

**IUPAC name:** *O,O*-diethyl *O*-3,5,6-trichloro-2-pyridyl phosphorothioate

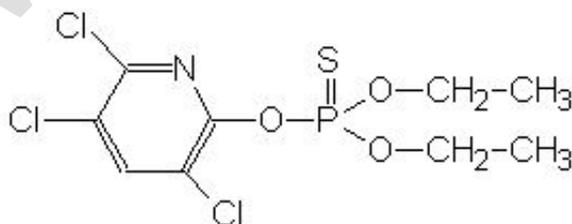
**Chemical Family:** Organophosphate

**CAS NO. :** 2921-88-2

**Molecular Formula:** C<sub>9</sub>H<sub>11</sub>Cl<sub>3</sub>NO<sub>3</sub>PS

**Molecular Weight:** 350.6

**Structural Formula:**



**Other ingredients determined not to be hazardous**

CHEMICAL NAME	CAS NO	PERCENT (w/w)
Chlorpyrifos	2921-88-2	≥44.7%
other	not available	≤55.3%



### 3. HAZARDS IDENTIFICATION

**Emergency overview:** Cholinesterase inhibitor; may be fatal if swallowed. Harmful if absorbed through skin or inhaled. Causes moderate eye irritation. Avoid breathing product vapors or spray mist. Avoid contact with eyes, skin or clothing. Keep out of reach of children. Dangerous for the environment.

Symptoms of over exposure are headaches, nausea, vomiting, cramps, weakness, blurred vision, pinpoint pupils, tightness in chest, labored breathing, nervousness, sweating, watering of eyes, drooling, muscle spasms and coma.

**Health effects:**

Eye: Irritating, and may injure eye tissue if not removed promptly.

Skin: Prolonged exposure may cause skin irritation. May cause sensitization by skin contact.

Inhalation: Inhalation of excessive amount of spray may cause cholinesterase inhibition. Prolonged exposure to solvent may cause respiratory irritation and central nervous system depression.

Ingestion: The concentrate is moderately toxic. Small amounts swallowed incidental to normal handling operations are not likely to cause injury. However, swallowing larger quantities may cause serious injury or even death. If the liquid entered the lungs it may cause lungs injury or even death due to pneumonia.

**Physical hazards:** Flammable liquid.

**Environmental hazards:** Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

### 4. FIRST AID MEASURES

**General:** If poisoning is suspected, immediately contact the poison information centre, doctor or nearest hospital. Have the product container, label or Material Safety Data Sheet with you when going for treatment. Tell the person contacted the complete product name, and the type and amount of exposure. Describe any symptoms and follow the advice given.

**If swallowed:** Call a poison control center or doctor immediately for treatment advice. Have a person sip a glass of water if able to swallow. Do not induce vomiting unless directed by a physician or a poison control center. Do not give anything by mouth to an unconscious person.

**If in eyes:** Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after 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 15-20 minutes. Call a poison control center or doctor for treatment advice.

**If inhaled:** Move person to fresh air. If not breathing, call an ambulance, then give artificial respiration,



preferably mouth-to-mouth. Call a poison control center or doctor for further treatment advice.

**Note to physician:** This product contains an organophosphate that inhibits cholinesterase. 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.

## 5. FIRE FIGHTING MEASURES

**Flash point:** >23°C.

**Flammable limits:**

LFL: Not determined.

UFL: Not determined.

**Autoignition temperature:** Not determined.

**Hazardous combustion products:** Under fire conditions, hydrogen chloride, ethyl sulfide, diethyl sulfide and nitrogen oxides can be formed.

**Extinguishing media:** Product is flammable. If product is involved in a fire, use waterspray, foam, dry powder, carbon dioxide or sand.

**Media to be avoided:** None.

**Fire-fighting instructions:** If possible and without risk, remove intact containers from exposure to fire. Otherwise, spray unopened containers with water to keep cool. Whenever possible, contain fire-fighting water by bunding area with sand or earth.

**Protective equipment for firefighters:** Wear self contained breathing apparatus.

## 6. ACCIDENT RELEASE MEASURES

**Personal precautions:** Use appropriate protection, see Section 8. During cleaning activity, shut off ignition sources.

**Environmental precautions:** Dispose of this material and its container at hazardous or special waste collection point, in accordance with national and regional regulations. If the product has contaminated surface water, inform the appropriate authorities. Contaminated soil layers have to be dug out.

**Method for cleaning up:** In the event of minor spillage: Absorb in sand or other inert material. Use appropriate containment to avoid environmental contamination. In the event of major spillage: Collect and contain as much free liquid as possible. Dike spills using absorbent or impervious materials such as sand or clay for later disposal.

## 7. HANDLING AND STORAGE



**Handling:** Do not breathe fumes. Avoid contact with skin and eyes.

**Storage:** Keep locked up. Keep container tightly closed. Keep only in the original container in a cool, well-ventilated place. Keep container dry. Keep away from strong bases. Keep away from sources of ignition and heat. No smoking.

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

**Exposure limits:** Exposure standard for Chlorpyrifos: 0.2 mg/m<sup>3</sup> (OSHA PEC)

**Engineering controls:** Natural ventilation only required when handling the concentrate. A local exhaust should be used in confined areas to keep the level of solvent within acceptable limits.

### Personal protective equipment (PPE):

**Skin protection:** Wear PVC or chemical resistant disposable overalls and PVC boots.

**Eye protection:** Wear safety goggles with unperforated side shield or goggles.

**Hand protection:** Wear chemical resistant PVC or nitrile gloves.

**User safety recommendations:** Avoid contact with the skin and eyes and avoid breathing the vapour. Do not inhale the spray mist. When opening the container of concentrate and preparing the spray, wear cotton overalls buttoned to the neck and wrist, washable hat and elbow-length PVC gloves. When using in an enclosed area wear face shield. If product spilled on skin wash area thoroughly with soap and water. After use and before eating drinking or smoking, wash hands, arms, face thoroughly with soap and water. After each day's use, wash gloves, face shield and contaminated clothing. Do not eat or smoke while spraying.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

**Appearance:** Clear light yellow to light brown liquid free of visible impurities.

**Odor:** Aromatic.

**Solubility in water:** Emulsifies.

**Flammability:** Flammable.

**Density:** Approx. 1.08 g/ml at 20 °C.

## 10. STABILITY AND REACTIVITY

**Chemical stability:** Stable under normal conditions.

**Conditions to avoid:** Protect from sunlight and excessive heat. Avoid temperature above 75°C.

**Hazardous decomposition products:** Under fire conditions, hydrogen chloride, ethyl sulfide, diethyl sulfide and nitrogen oxides can be formed.

**Incompatible materials:** Strong alkalis, amines and oxidizers.

**Hazardous reactions:** Hazardous polymerization will not occur.



## 11. TOXICOLOGICAL INFORMATION

### Acute toxicity:

Oral: LD<sub>50</sub> 409 mg/kg (rat).  
Dermal: LD<sub>50</sub> >2000 mg/kg (rat).  
Inhalation: LC<sub>50</sub> 2.62 mg/l, 4 hours (rat).

### Irritant properties:

Skin: Irritating (rabbit).  
Eye: Irritating (rabbit).

**Allergenic and sensitizing effects:** Sensitizer (Guinea pig).

**Chronic toxicity/Carcinogenicity:** There is no evidence that chlorpyrifos is carcinogenic. There was no increase in the incidence of tumors when rats were fed 10 mg/kg/day for 104 weeks, nor when mice were fed 2.25 mg/kg/day for 105 weeks. Repeated or prolonged exposure to organophosphates may result in the same effects as acute exposure including the delayed symptoms. When technical chlorpyrifos was fed to dogs for 2 years, increased liver weight occurred at 3.0 mg/kg/day. Signs of cholinesterase inhibition occurred at 1 mg/kg/day. Rats and mice given technical chlorpyrifos in the diet for 104 weeks showed no adverse effects other than cholinesterase inhibition. Two-year feeding studies using doses of 1 and 3 mg/kg/day of chlorpyrifos in rats showed moderate depression of cholinesterase.

**Genetic effects/Mutagenicity:** There is no evidence that chlorpyrifos is mutagenic. No evidence of mutagenicity was found in any of four tests performed.

**Reproductive effects:** Current evidence indicates that chlorpyrifos does not adversely affect reproduction. In two studies, no effects were seen in animals tested at dose levels up to 1.2 mg/kg/day. No effects on reproduction occurred in a three-generation study with rats fed dietary doses as high as 1 mg/kg/day. In another study in which rats were fed 1.0 mg/kg/day for two generations, the only effect observed was a slight increase in the number of deaths of newborn offspring.

**Teratogenic effects:** Available evidence suggests that chlorpyrifos is not teratogenic. No teratogenic effects in offspring were found when pregnant rats were fed doses as high as 15 mg/kg/day for 10 days. When pregnant mice were given doses of 25 mg/kg/day for 10 days, minor skeletal variations and a decrease in fetal length occurred. No birth defects were seen in the offspring of male and female rats fed 1.0 mg/kg/day during a three-generation reproduction and fertility study.

**Target organ effects:** Chlorpyrifos primarily affects the nervous system through inhibition of cholinesterase, an enzyme required for proper nerve functioning.

## 12. ECOLOGICAL INFORMATION



The following information is for the active ingredient, Chlorpyrifos.

**Ecotoxicity:**

- Birds Acute oral LD<sub>50</sub>: 490 mg/kg (mallard ducks), 32-102 mg/kg (chickens).  
Dietary LC<sub>50</sub> (5 days): 423 ppm (bobwhite quail).
- Fish Highly toxic to fish. LC<sub>50</sub> (96 h): 0.002-0.010 mg/l (bluegill sunfish), 0.007-0.051 mg/l (rainbow trout).
- Daphnia EC<sub>50</sub> (48 h): 0.21 µg/l.
- Algae NOEC: >0.4 mg/l.
- Bees Toxic to bees.  
LD<sub>50</sub> (oral): 360 ng/bee.  
LD<sub>50</sub> (contact): 70 ng/bee.
- Worm: LC<sub>50</sub> (14 days): 210 mg/kg soil.

**Persistence and degradability:** Chlorpyrifos is moderately persistent in soils. The half-life in soil is usually between 60 and 120 days, but can range from 2 weeks to over 1 year, depending on the soil type, climate, and other conditions. Chlorpyrifos was less persistent in the soils with a higher pH. Soil half-life was not affected by soil texture or organic matter content.

**Bioaccumulative potential:** Chlorpyrifos accumulates in the tissues of aquatic organisms. Studies involving continuous exposure of fish during the embryonic through fry stages have shown bioconcentration values of 58 to 5100.

**Mobility in soil:** Chlorpyrifos adsorbs strongly to soil particles and it is not readily soluble in water. It is therefore immobile in soils and unlikely to leach or to contaminate groundwater. TCP, the principal metabolite of chlorpyrifos, adsorbs weakly to soil particles and appears to be moderately mobile and persistent in soils.

### 13. DISPOSAL CONSIDERATION

Never re-use the empty containers. Destroy and bury in a safe place. Dispose off packages or surplus material in a safe manner to prevent environmental and water pollution.

This product is very toxic to aquatic organisms. Do not contaminate ponds, waterways or ditches with chemical or used container. Wash out thoroughly. Container and washings must be disposed of safely and in accordance with applicable regulations. The preferred options are to send to licensed reclaimer or to permitted incinerators. Do not re-use container for any purpose.

### 14. TRANSPORT INFORMATION

UN Number: 3017



**UN Proper shipping name:** Organophosphorus pesticides, liquid, toxic, flammable

**Transport hazard class:** 6.1

**Packing group:** III

**Marine pollutant:** Yes

## 15. REGULATORY INFORMATION

### Hazard symbols:

Xn: Harmful

N: Dangerous for the environment

### Risk phrases:

R10: Flammable.

R21/22: Harmful in contact with skin and if swallowed.

R38: Irritating to skin.

R50/53: Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

R65: Harmful: may cause lung damage if swallowed.

### Safety phrases:

S23: Do not breathe fumes/vapour/spray.

S28: After contact with skin, wash immediately with plenty of soap and water.

S36/37/39: Wear suitable protective clothing, gloves and eye/face protection.

S45: In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible.).

## 16. OTHER INFORMATION

This MSDS summarizes our best knowledge of the health and safety hazard information of the product and how to safely handle and use the product in the workplace. Each user should read this MSDS and consider the information in the context of how the product will be handled and used in the workplace including in conjunction with other products.

If clarification or further information is needed to ensure that an appropriate risk assessment can be made the user should contact this company.

END OF MSDS