MATERIAL SAFETY DATA SHEET OF

CHLOROTHALONIL 75% WP

1. IDENTIFICATION OF THE CHEMICAL PRODUCT AND COMPANY

Supplier: SHANGHAI MINGDOU AGROCHEMICAL CO., LTD
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Product name: Chlorothalonil 75% WP
Product use: Fungicide

2. COMPOSITION/INFORMATION ON INGREDIENTS

Formulation Type: Wettable powder
Active Ingredients: chlorothalonil
Chemical Abstracts name: 2,4,5,6-tetrachloro-1,3-benzenedicarbonitrile
IUPAC name: tetrachloroisophthalonitrile
Chemical class: Chlorinated benzonitrile fungicide
CAS NO. 1897-45-6
Molecular Formula: C₈Cl₄N₂
Molecular Weight: 265.9
Structural Formula:

Composition:

<table>
<thead>
<tr>
<th>INGREDIENT</th>
<th>CAS NO</th>
<th>PROPORTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chlorothalonil</td>
<td>1897-45-6</td>
<td>75% Min.</td>
</tr>
<tr>
<td>Inert ingredients</td>
<td>Not available</td>
<td>25% Max.</td>
</tr>
</tbody>
</table>

Other ingredients determined not to be hazardous

3. HAZARDS INDENTIFICATION

Emergency overview: Caution! Can cause eye and skin irritation. Avoid breathing dust or spray mist. Keep out of reach of children.
Routes of entry: Ingestion, inhalation, contact with skin.

Health hazards:
Eye contact: Contact will cause severe eye irritation
Skin contact: Prolonged or repeated skin contact may cause mild irritation.
Inhalation: Mist or dust concentration may be irritating to respiratory tract.
Ingestion: This material may cause vomiting, nausea, diarrhoea and abdominal cramps.

4. FIRST AID MEASURES

General: 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.

Skin contact: Remove contaminated clothing and wash skin with plenty of soap and water.

Eye contact: Wash eyes with fresh water for 15 minutes. If irritation continues, see a doctor.

Ingestion: Rinse mouth with water. Do not induce vomiting. Keep patient at rest and Seek medical attention.

Inhalation: Remove person from exposure area to fresh air. Keep patient at most comfort level and keep warm. Get medical attention.

Note to physician: No specific antidote. Treat symptomatically.

5. FIRE FIGHTING MEASURES

Flash point: Not applicable.

Flammable limits: Not determined.

Autoignition temperature: Not determined.

Hazardous combustion products: On burning, formation of hydrogen chloride, hydrogen cyanide, carbon monooxide and nitrogen oxides can be expected.

Extinguishing media: Use foam, Water fog/water spray, dry agents (Carbon dioxide, dry chemical powder).

Fire-fighting instructions: If product is involved in a fire, wear positive-pressure, self-contained breathing apparatus and full protective clothing.

Protective equipment for firefighters: Wear self-contained breathing apparatus pressure and full protective gear.

6. ACCIDENT RELEASE MEASURES

Personal precautions: See section 8.

Environmental precautions: Do not allow any material to run off in soil, drainage systems or bodies of
water.

**Method for cleaning up:** Clean up spills immediately, observing precautions, Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Vacuum or sweep up material and place in properly labeled disposal container. Large spills may be neutralized with dilute solutions of soda ash or lime. After removal, flush contaminated area thoroughly with water. Notify and consult with proper regulatory authorities.

### 7. HANDLING AND STORAGE

**Handling:** Read the label before use. Use only in well ventilated area. Follow all MSDS/label precautions even after container is emptied because they may retain product residues.

**Storage:** Store in a cool dry place in original container and protect from sunlight. Keep away from food, animal feed and drinking water.

### 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

**Exposure limits:** No exposure limits have been established for this material.

**Engineering controls:** Local exhaust ventilation may be necessary to control any air contaminants to within their TLV’s during the use of this product. Facilities storing or utilizing this material should be equipped with eyewash facility and safety shower.

**Personal protective equipment (PPE):**
- Skin protection: Long sleeved shirt and long pants, shoes plus socks, chemical resistant headgear for overhead exposures. Waterproof gloves.
- Eye protection: Safety glasses.

**User safety recommendations:** 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 in to clean clothing.

### 9. PHYSICAL AND CHEMICAL PROPERTIES

**Appearance:** Off-white powder.

**Odor:** Slightly pungent odor.

**Flammability:** Not flammable.

**Solubility in water:** Miscible.

**Explosion properties:** Not explosive.

**Oxidation properties:** Not oxidizing.
10. STABILITY AND REACTIVITY

Chemical stability: Stable under normal conditions.

Conditions to avoid: Excessive heat may be avoided.

Hazardous decomposition: On burning, formation of hydrogen chloride, hydrogen cyanide, carbon monoxide and nitrogen oxides can be expected.

Incompatible materials: Oxidising agents.

Hazardous reactions: Hazardous polymerization will not occur.

11. TOXICOLOGICAL INFORMATION

The following information is for the active ingredient, chlorothalonil.

Acute toxicity:
Oral: LD$_{50}$ >5000 mg/kg (rat)
Dermal: LD$_{50}$ >5000 mg/kg (rabbit)
Inhalation: LC$_{50}$ >0.52 mg/l (rat)

Irritant properties:
Skin: mild irritant (rabbit).
Eye: severe irritant (rabbit).

Allergenic and sensitizing effects:
Evidence in humans of contact dermatitis with repeated exposure.

Chronic toxicity: In dogs, 1 year administration caused a significant decrease in body weight gain and increases in absolute liver and kidney weights.

Carcinogenicity: No evidence of carcinogenicity in dogs after administration for up to one year. Treatment related increases in the incidence of renal tubular adenoma and carcinoma were observed in rats and male mice. Squamous cell adenomas and carcinomas were also observed in the forestomach of both species. The forestomach tumors seen in rodent studies are not relevant to human health, as humans do not possess an anatomical equivalent of the rodent forestomach. The relevance of renal tumors to human health is unclear, although metabolism data suggest that the dog, a species that is resistant to chlorothalonil-induced renal injury, may be more representative of humans than the rat. Chlorothalonil is considered to be possibly carcinogenic to humans.

Neurological effects: No evidence of adverse developmental effects in rabbit and rat studies.

Teratogenic effects: Long-term studies indicate that high doses fed to rats caused reduced weight gains for males and females in each generation studied. Female rats given high doses of chlorothalonil through the stomach during the sensitive period of gestation had normal fetuses, even though that dose was toxic to
the mothers. A study of birth defects in rabbits showed no effects. Chlorothalonil is not expected to produce birth defects in humans.

**Genetic effects/Mutagenicity:** Mutagenicity studies on various animals, bacteria, and plants indicate that chlorothalonil does not cause any genetic changes. The compound is not expected to pose mutagenic risks to humans.

**Reproductive effects:** Administration of high doses of chlorothalonil to pregnant rabbits through the stomach during the sensitive period of gestation was required to induce abortion in 4 of the 9 mothers. This and other studies suggest that chlorothalonil will not affect human reproduction at expected exposure levels.

**Target organ effects:** Chronic studies of rats and dogs fed high dietary levels show that chlorothalonil is toxic to the kidney. In addition to less urine output, changes in the kidney included enlargement, greenish-brown color, and development of small grains.

### 12. ECOLOGICAL INFORMATION

The following information is for the active ingredient, chlorothalonil.

**Ecotoxicity:**
- **Birds**
  - Acute oral LD$_{50}$: for mallard ducks >4640 mg/kg.
  - Dietary LC$_{50}$ (5 days): for mallard ducks and bobwhite quail >10 000 mg/kg diet.
- **Fish**
  - LC$_{50}$ (96 h): for rainbow trout 47, bluegill sunfish 59, channel catfish 43 μg/l.
- **Daphnia**
  - EC$_{50}$ (48 h): 70 μg/l.
- **Algae**
  - EC$_{50}$: (120 h) *Selenastrum capricornutum* 210 μg/l; (72 h) *Navicula pelliculosa* 5.1 μg/l.
- **Bees**
  - LD$_{50}$ (oral): >63 μg/bee
  - LD$_{50}$ (contact): >101 μg/bee
- **Earthworm**
  - LC$_{50}$ (14 days): >404 mg/kg dry soil

**Bioaccumulative potential:** Low bioaccumulation potential.

**Mobility in soil:** Low mobility in soil. Sinks in water (after 24 h).

### 13. DISPOSAL CONSIDERATION

Do not reuse product containers. Dispose of product containers, waste containers, and residues according to local, state and federal health and environmentally regulations.

### 14. TRANSPORT INFORMATION

**UN Number:** 3082

**UN Proper shipping name:** Environmentally hazardous substance, liquid, n.o.s. (Chlorothalonil)

**Transport hazard class:** 9
Packing group: III
Marine pollutant: Yes

15. REGULATORY INFORMATION

Hazard symbols:

N Dangerous for the environment

Risk phrases:

R40 Limited evidence of a carcinogenic effect
R50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

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 the 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 the company.

END OF MSDS